POWERTECH (USA) INC.



# APPENDIX 2.7-M

# Dewey-Burdock Project Flood Analysis

# DEWEY-BURDOCK PROJECT
# FLOOD ANALYSIS

Prepared for:

Powertech (USA) Inc.

June 2011

WWC ENGINEERING
Serving the Rocky Mountain region since 1980.
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# DEWEY-BURDOCK PROJECT FLOOD ANALYSIS


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POWERTECH (USA) INC.

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# Appendix 2.7-M Dewey-Burdock Project Flood Analysis

## 2.7-M-1 Peak Flow Study

Powertech has conducted a flood analysis for Beaver Creek and Pass Creek within the project area, as provided in Section 2.7.1.4 of the Technical Report. Appendix 2.7-M was prepared to address the flood analysis, including peak flow and inundation resulting from the 100-year 24-hour precipitation event, for the minor tributaries to Beaver Creek and Pass Creek.

U.S. Army Corps of Engineers (USACE) HEC-HMS model was used to estimate peak flows and runoff volumes resulting from a 100-year 24-hour recurrence interval precipitation event within the project area. This program was selected due to the size of the drainage area, the watershed routing functions offered by HEC-HMS, and the universal acceptance of HEC-HMS within the hydrologic sciences community. The HEC-HMS model uses a form of the Natural Resource Conservations Service (NRCS) Triangular Hydrograph Method, and is a parametric method of estimating flood peaks and runoff volumes from site-specific data, in addition to providing watershed routing parameters. The NRCS method was utilized for the evaluation of individual watershed hydrology, while the Muskingum method was used for routing procedures. Procedures followed in applying these methods may be found in the HEC-HMS Users Manual (USACE, 2001), HEC-HMS Technical Reference Manual (USACE, 2000) and the U.S. Bureau of Reclamation publication Design of Small Dams (USBR, 1977).

The precipitation value (4.8 inches) for the 100-year 24-hour storm event was obtained from the national depth-duration-frequency maps as reported in Table 2.7-5 of the Technical Report. Curve numbers were calculated by area-weighting the drainage basin soil types according to hydrologic soil group as determined from the soil survey information obtained from the NRCS soil survey geographic database for Niobrara County, Wyoming, and Custer and Fall River Counties, South Dakota. Attachment

2.7-M-1 provides a summary of the soil type, corresponding soils hydrologic group, and curve number used for the area-weighting. The average antecedent moisture condition (AMC) of two was applied.

The input parameters and results of the HEC-HMS analyses are summarized in Table 2.7-M-1. The hydrologic elements used in the HEC-HMS analyses are shown on Exhibit 2.7-M-1. There are several reservoirs located within the project area. To obtain a conservative estimate of peak flow, the routing effects of the reservoirs were not included in the model.

### 2.7-M-2 Flood Inundation Study

Powertech (USA) has conducted a flood inundation study for Beaver Creek and Pass Creek within the project area, as provided in Section 2.7.1.4 of the Technical Report. This appendix addresses the 100-year 24-hour flood inundation for the minor tributaries to Beaver Creek and Pass Creek. Peak flood depths were modeled for stream channels within the project area for a peak discharge resulting from the 100-year 24-hour precipitation event. Initial cross sections were generated at 250 ft intervals on the main tributary channels within the project area using 2-foot contour interval mapping data. Additional cross sections were added near various confluence points along the tributaries as wells as embankments across the channels. Using the peak runoff values calculated from HEC-HMS, a HEC-RAS (USACE, 1997) model was used to define the area of inundation during the 100-year 24-hour storm event. The primary input parameters to the model are discharge, stream cross section (in the form of station/elevation data), and channel and overbank roughness coefficients (Manning's n). Exhibit 2.7-M-2 provides the locations of the minor tributaries that were evaluated and the 100-year 24-hour inundation area.

HEC-RAS is a hydraulic model developed by the Army Corps of Engineers Hydrologic Engineering Center. Use of the HEC-RAS model is generally accepted methodology for determining water surface profiles in natural or man-made channels. The model is used for flood insurance studies, evaluations of floodway

encroachments (bridge, levees, culverts, weirs, channelization, and other structures), and a wide variety of engineering applications.

Channel cross sections for the HEC-RAS model were developed from the 2 foot contour interval mapping of the project area. A Manning's roughness coefficient n of 0.035 was used in the evaluation. A roughness coefficient of 0.035 is reflective of a vegetated channel. Manning's n was estimated using a 2 foot contour map as well as a site investigation. Cowan's method (Chow, 1959), which accounts for channel materials, irregularity, cross section variance, obstructions, vegetation, and meandering, was used to estimate Manning's n.

The 100-year 24-hour flood inundation boundary is presented on Exhibit 2.7-M-2; the HEC-RAS sections are presented on Exhibit 2.7-M-3. The inundation boundaries were prepared based on the HEC-RAS cross sections and 100-year 24-hour water surface profiles. Throughout the project area there are several reservoirs. The flood boundaries were drawn to account for these existing reservoirs. There are several instances where the 100-year 24-hour peak flow is not contained within the channel or where the channel flows into a flat plain. In these areas professional judgment was used to estimate inundation. The individual HEC-RAS results are presented in Attachments 2.7-M-2 through 2.7-M-18.

## 2.7-M-3 References

Chow, V.T., 1959, Open Channel hydraulics, McGraw-Hill.

U.S. Army Corp of Engineers (USACE), 2001, Hydrologic Modeling System - HEC-HMS User's Manual (Version 2.1). Available from the website on the Internet as of October 2010: <http://www.hec.usace.army.mil/software/hec-hms/documentation/CPD-74A_2001Jan.pdf>

_____, 2000, Hydrologic Modeling System - HEC-HMS Technical Reference Manual. Available from the website on the Internet as of October 2010: <http://www.hec.usace.army.mil/software/hec-hms/documentation/CPD-74B_2000Mar.pdf

_____, 1997, HEC-RAS River Analysis System, version 2.0 U.S. Army Corps of Engineers Hydrologic Engineering Center.

U.S. Bureau of Reclamation (USBR), 1977, Design of Small Dams, BOR Stock No. 924-00300011908, 816 p.

| Drainage Basin | Hydraulic Element[1] | Drainage Area ($mi^2$) | Curve Number | Watershed Lag Time (hrs) | Peak Discharge (cfs) | Volume (acre-ft) |
|---|---|---|---|---|---|---|
| 1 | Subbasin-1a | 3.71 | 75 | 1.68 | 1387.6 | 452.7 |
| | Junction-1 | 3.71 | | | 1387.6 | 452.7 |
| | Reach-1 | 3.71 | | 0.61 | 1387.0 | 452.7 |
| | Subbasin-1b | 0.72 | 75 | 0.71 | 506.1 | 87.7 |
| | Junction-2 | 4.43 | | | 1489.9 | 540.5 |
| 2 | Subbasin-2a | 0.69 | 75 | 0.51 | 679.5 | 92.9 |
| | Junction-1 | 0.69 | | | 679.5 | 92.9 |
| | Reach-1 | 0.69 | | 0.29 | 675.2 | 92.9 |
| | Subbasin-2b | 0.57 | 75 | 0.83 | 406.3 | 77.7 |
| | Junction-2 | 1.26 | | | 1077.4 | 170.6 |
| 3 | Subbasin-3a | 0.29 | 73 | 0.34 | 324.1 | 33.1 |
| | Junction-1 | 0.29 | | | 324.1 | 33.1 |
| | Reach-1 | 0.29 | | 0.09 | 323.0 | 33.1 |
| | Subbasin-3b | 0.02 | 73 | 0.21 | 33.9 | 2.6 |
| | Junction-2 | 0.32 | | | 341.1 | 35.7 |
| 4 | Subbasin-4 | 0.34 | 73 | 0.79 | 210.5 | 38.4 |
| | Junction-1 | 0.34 | | | 210.5 | 38.4 |
| 5 | Subbasin-5a | 0.20 | 73 | 0.36 | 212.4 | 23.5 |
| | Junction-1 | 0.20 | | | 212.4 | 23.5 |
| | Reach-1 | 0.20 | | 0.22 | 207.8 | 23.5 |
| | Subbasin-5b | 0.19 | 71 | 0.31 | 223.5 | 22.8 |
| | Junction-2 | 0.39 | | | 368.9 | 46.4 |
| 6 | CLOSED BASIN | | | | | |
| 7 | Subbasin-7b | 0.18 | 77 | 0.33 | 235.9 | 22.9 |
| | Subbasin-7c | 0.04 | 82 | 0.22 | 80.9 | 6.2 |
| | Junction-1 | 0.22 | | | 304.8 | 29.1 |
| | Reach-1 | 0.22 | | 0.01 | 304.8 | 29.1 |
| | Subbasin-7a | 0.22 | 73 | 0.46 | 204.9 | 25.3 |
| | Subbasin-7d | 0.00 | 79 | 0.09 | 1.3 | 0.1 |
| | Junction-2 | 0.44 | | | 485.1 | 54.5 |
| | Reach-2 | 0.44 | | 0.23 | 485.1 | 54.5 |
| | Subbasin-7e | 0.27 | 79 | 0.43 | 328.3 | 37.9 |
| | Junction-3 | 0.71 | | | 783.5 | 92.3 |
| | Reach-3 | 0.71 | | 0.02 | 783.5 | 92.3 |
| | Subbasin-7f | 0.13 | 79 | 0.32 | 189.1 | 18.0 |
| | Junction-4 | 0.13 | | | 189.1 | 18.0 |
| | Reach-4 | 0.13 | | 0.07 | 189.1 | 18.0 |
| | Subbasin-7g | 0.01 | 80 | 0.20 | 21.9 | 1.6 |
| | Junction-5 | 0.85 | | | 941.0 | 111.9 |
| | Reach-5 | 0.85 | | 0.20 | 941.0 | 111.9 |
| | Subbasin-7h | 0.11 | 81 | 0.37 | 161.2 | 16.8 |

| Drainage Basin | Hydraulic Element[1] | Drainage Area ($mi^2$) | Curve Number | Watershed Lag Time (hrs) | Peak Discharge (cfs) | Volume (acre-ft) |
|---|---|---|---|---|---|---|
| 7 | Junction-6 | 0.96 | | | 1022.4 | 128.7 |
| 8 | CLOSED BASIN | | | | | |
| 9 | Subbasin-9c | 0.43 | 78 | 0.47 | 478.9 | 58.9 |
| | Junction-2 | 0.43 | | | 478.9 | 58.9 |
| | Reach-2 | 0.43 | | 0.07 | 478.9 | 58.9 |
| | Subbasin-9a | 0.28 | 78 | 0.48 | 307.7 | 38.4 |
| | Junction-1 | 0.28 | | | 307.7 | 38.4 |
| | Reach-1 | 0.28 | | 0.12 | 307.7 | 38.4 |
| | Subbasin-9b | 0.08 | 80 | 0.45 | 95.2 | 11.3 |
| | Subbasin-9d | 0.02 | 80 | 0.23 | 40.8 | 3.2 |
| | Junction-3 | 0.82 | | | 885.8 | 111.7 |
| | Reach-3 | 0.82 | | 0.14 | 885.8 | 111.7 |
| | Subbasin-9f | 0.09 | 80 | 0.30 | 146.3 | 13.3 |
| | Junction-4 | 0.91 | | | 942.9 | 125.1 |
| | Reach-4 | 0.91 | | 0.26 | 942.9 | 125.1 |
| | Subbasin-9i | 0.34 | 79 | 0.43 | 408.6 | 47.1 |
| | Junction-5 | 0.34 | | | 408.6 | 47.1 |
| | Reach-5 | 0.34 | | 0.26 | 408.6 | 47.1 |
| | Subbasin-9h | 0.30 | 80 | 0.39 | 404.9 | 43.7 |
| | Subbasin-9k | 0.04 | 80 | 0.42 | 56.3 | 6.4 |
| | Junction-6 | 1.59 | | | 1463.4 | 222.2 |
| | Reach-6 | 1.59 | | 0.29 | 1463.4 | 222.2 |
| | Subbasin-9j | 0.04 | 80 | 0.29 | 68.2 | 6.1 |
| | Junction-7 | 0.04 | | | 68.2 | 6.1 |
| | Reach-7 | 0.04 | | 0.32 | 68.2 | 6.1 |
| | Subbasin-9l | 0.31 | 80 | 0.46 | 376.3 | 45.4 |
| | Subbasin-9o | 0.10 | 79 | 0.70 | 84.3 | 13.7 |
| | Junction-8 | 2.04 | | | 1678.3 | 287.5 |
| | Reach-8 | 2.04 | | 0.13 | 1678.3 | 287.5 |
| | Subbasin-9m | 0.30 | 80 | 0.45 | 371.0 | 44.1 |
| | Junction-9 | 0.30 | | | 371.0 | 44.1 |
| | Reach-9 | 0.30 | | 0.03 | 371.0 | 44.1 |
| | Subbasin-9n | 0.02 | 80 | 0.29 | 37.4 | 3.3 |
| | Junction-10 | 2.37 | | | 1794.7 | 334.9 |
| | Reach-10 | 2.37 | | 0.22 | 1794.7 | 334.9 |
| | Subbasin-9e | 0.40 | 79 | 0.58 | 392.4 | 55.8 |
| | Subbasin-9g | 0.03 | 80 | 0.30 | 54.1 | 4.9 |
| | Junction-11 | 0.43 | | | 420.8 | 60.8 |
| | Reach-11 | 0.43 | | 0.56 | 420.8 | 60.8 |
| | Subbasin-9q | 0.38 | 76 | 1.21 | 195.6 | 48.6 |
| | Subbasin-9p | 0.11 | 70 | 0.68 | 63.5 | 10.6 |

| Drainage Basin | Hydraulic Element[1] | Drainage Area ($mi^2$) | Curve Number | Watershed Lag Time (hrs) | Peak Discharge (cfs) | Volume (acre-ft) |
|---|---|---|---|---|---|---|
| 9 | Junction-12 | 3.29 | | | 2395.7 | 454.8 |
| | Reach-12 | 3.29 | | 0.16 | 2395.7 | 454.8 |
| | Subbasin-9r | 0.04 | 70 | 0.30 | 46.1 | 4.3 |
| | Junction-13 | 3.33 | | | 2401.6 | 459.1 |
| 10 | Subbasin-10a | 0.11 | 80 | 0.32 | 162.1 | 15.4 |
| | Junction-1 | 0.11 | | | 162.1 | 15.4 |
| | Reach-1 | 0.11 | | 0.20 | 162.1 | 15.4 |
| | Junction-2 | 0.41 | | | 524.2 | 56.2 |
| | Subbasin-10b | 0.30 | 78 | 0.37 | 390.9 | 40.8 |
| | Reach-2 | 0.41 | | 0.32 | 524.2 | 56.2 |
| | Subbasin-10c | 0.07 | 78 | 0.57 | 69.3 | 9.8 |
| | Junction-3 | 0.48 | | | 587.6 | 66.0 |
| 11 | Subbasin-11a | 0.22 | 80 | 0.36 | 314.8 | 32.2 |
| | Junction-1 | 0.22 | | | 314.8 | 32.2 |
| | Reach-1 | 0.22 | | 0.11 | 314.8 | 32.2 |
| | Subbasin-11b | 0.03 | 80 | 0.25 | 58.5 | 4.8 |
| | Junction-2 | 0.03 | | | 58.5 | 4.8 |
| | Reach-2 | 0.03 | | 0.18 | 58.5 | 4.8 |
| | Subbasin-11c | 0.10 | 80 | 0.37 | 137.9 | 14.4 |
| | Subbasin-11d | 0.02 | 80 | 0.24 | 27.2 | 2.2 |
| | Junction-3 | 0.37 | | | 520.3 | 53.5 |
| | Reach-3 | 0.37 | | 0.07 | 520.3 | 53.5 |
| | Subbasin-11e | 0.01 | 80 | 0.26 | 15.6 | 1.3 |
| | Junction-4 | 0.38 | | | 528.9 | 54.8 |
| 12 | Subbasin-12a | 0.06 | 79 | 0.24 | 103.3 | 8.3 |
| | Junction-1 | 0.06 | | | 103.3 | 8.3 |
| | Reach-1 | 0.06 | | 0.13 | 103.3 | 8.3 |
| | Subbasin-12b | 0.23 | 79 | 0.37 | 309.5 | 32.3 |
| | Junction-2 | 0.29 | | | 412.7 | 40.5 |
| | Reach-2 | 0.29 | | 0.17 | 412.7 | 40.5 |
| | Subbasin-12c | 0.16 | 80 | 0.48 | 190.2 | 23.6 |
| | Junction-3 | 0.45 | | | 600.6 | 64.2 |
| | Reach-3 | 0.45 | | 0.15 | 600.6 | 64.2 |
| | Subbasin-12d | 0.08 | 80 | 0.32 | 114.7 | 10.9 |
| | Junction-4 | 0.53 | | | 651.1 | 75.1 |
| 13 | Subbasin-13a | 0.10 | 77 | 0.37 | 126.4 | 13.2 |
| | Junction-1 | 0.10 | | | 126.4 | 13.2 |
| 14 | Subbasin-14c | 1.74 | 72 | 0.86 | 971.6 | 190.1 |
| | Subbasin-14b | 0.70 | 73 | 0.68 | 486.3 | 79.4 |
| | Junction-1 | 2.44 | | | 1427.9 | 269.5 |
| | Reach-1 | 2.44 | | 0.14 | 1427.9 | 269.5 |

| Drainage Basin | Hydraulic Element[1] | Drainage Area ($mi^2$) | Curve Number | Watershed Lag Time (hrs) | Peak Discharge (cfs) | Volume (acre-ft) |
|---|---|---|---|---|---|---|
| 14 | Subbasin-14a | 2.32 | 69 | 1.51 | 730.5 | 224.4 |
| | Subbasin-14d | 0.05 | 63 | 0.40 | 28.9 | 3.5 |
| | Junction-2 | 4.81 | | | 1969.0 | 497.5 |
| | Reach-2 | 4.81 | | 0.18 | 1969.0 | 497.5 |
| | Subbasin-14e | 0.32 | 66 | 0.44 | 217.6 | 27.4 |
| | Junction-3 | 5.14 | | | 2032.3 | 524.9 |
| 15 | Subbasin-15a | 0.09 | 70 | 0.33 | 92.7 | 9.3 |
| | Junction-1 | 0.09 | | | 92.7 | 9.3 |
| | Reach-1 | 0.09 | | 0.04 | 92.7 | 9.3 |
| | Subbasin-15b | 0.03 | 68 | 0.25 | 36.0 | 3.1 |
| | Junction-2 | 0.13 | | | 124.1 | 12.3 |
| | Reach-2 | 0.13 | | 0.38 | 124.1 | 12.3 |
| | Subbasin-15c | 0.59 | 71 | 0.61 | 402.5 | 61.5 |
| | Junction-3 | 0.71 | | | 523.1 | 73.8 |
| 16 | Subbasin-16a | 0.02 | 71 | 0.22 | 29.7 | 2.3 |
| | Junction-1 | 0.02 | | | 29.7 | 2.3 |
| 17 | Subbasin-17a | 0.13 | 69 | 0.30 | 132.8 | 12.6 |
| | Junction-1 | 0.13 | | | 132.8 | 12.6 |

1) See Exhibit 2.7-M-1 for hydrologic element locations.

# Attachment 2.7-M-1

# Dewey-Burdock Hydrologic Soil Groups

| Soil Identification[2] | Hydrologic Soil Group[2] | Curve Number[1] | | | | | |
|---|---|---|---|---|---|---|---|
| | | Noncultivated agricultural land, Pasture or range, No mechanical treatment | | | Forestland, Woods | | |
| | | Poor | Fair | Good | Poor | Fair | Good |
| 118 | BC | 83 | 74 | 68 | 72 | 67 | 63 |
| 127 | BC | 83 | 74 | 68 | 72 | 67 | 63 |
| 130 | D | 89 | 84 | 80 | 83 | 79 | 77 |
| 160 | D | 89 | 84 | 80 | 83 | 79 | 77 |
| 185 | CD | 88 | 82 | 77 | 80 | 76 | 74 |
| 186 | CD | 88 | 82 | 77 | 80 | 76 | 74 |
| 189 | D | 89 | 84 | 80 | 83 | 79 | 77 |
| 196 | D | 89 | 84 | 80 | 83 | 79 | 77 |
| 204 | BC | 83 | 74 | 68 | 72 | 67 | 63 |
| 206 | BCD | 85 | 77 | 72 | 75 | 71 | 67 |
| 207 | B | 79 | 69 | 61 | 66 | 60 | 55 |
| 211 | C | 86 | 79 | 74 | 77 | 73 | 70 |
| 215 | BC | 83 | 74 | 68 | 72 | 67 | 63 |
| Ar | D | 89 | 84 | 80 | 83 | 79 | 77 |
| AsA | D | 89 | 84 | 80 | 83 | 79 | 77 |
| AsB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| Bc | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BdA | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BeB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BoB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BpB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BrB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BrD | D | 89 | 84 | 80 | 83 | 79 | 77 |
| BsB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| BvD | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| BwE | D | 89 | 84 | 80 | 83 | 79 | 77 |
| CdF | D | 89 | 84 | 80 | 83 | 79 | 77 |
| CnD | B | 79 | 69 | 61 | 66 | 60 | 55 |
| DgB | D | 89 | 84 | 80 | 83 | 79 | 77 |
| DwB | A | 68 | 49 | 39 | 45 | 36 | 25 |
| EaC | B | 79 | 69 | 61 | 66 | 60 | 55 |
| GrD | D | 89 | 84 | 80 | 83 | 79 | 77 |
| GrE | D | 89 | 84 | 80 | 83 | 79 | 77 |
| GrF | D | 89 | 84 | 80 | 83 | 79 | 77 |
| GsD | CD | 88 | 82 | 77 | 80 | 76 | 74 |
| GuC | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| Ha | B | 79 | 69 | 61 | 66 | 60 | 55 |
| HaA | B | 79 | 69 | 61 | 66 | 60 | 55 |

| Soil Identification[2] | Hydrologic Soil Group[2] | Curve Number[1] | | | | | |
|---|---|---|---|---|---|---|---|
| | | Noncultivated agricultural land, Pasture or range, No mechanical treatment | | | Forestland, Woods | | |
| | | Poor | Fair | Good | Poor | Fair | Good |
| He | D | 89 | 84 | 80 | 83 | 79 | 77 |
| KyA | D | 89 | 84 | 80 | 83 | 79 | 77 |
| KyB | D | 89 | 84 | 80 | 83 | 79 | 77 |
| Lo | C | 86 | 79 | 74 | 77 | 73 | 70 |
| MbA | C | 86 | 79 | 74 | 77 | 73 | 70 |
| MbB | C | 86 | 79 | 74 | 77 | 73 | 70 |
| MmE | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| MpE | CD | 88 | 82 | 77 | 80 | 76 | 74 |
| NfE | B | 79 | 69 | 61 | 66 | 60 | 55 |
| NoB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| NuA | C | 86 | 79 | 74 | 77 | 73 | 70 |
| NuB | C | 86 | 79 | 74 | 77 | 73 | 70 |
| PeB | D | 89 | 84 | 80 | 83 | 79 | 77 |
| PgC | D | 89 | 84 | 80 | 83 | 79 | 77 |
| PgE | D | 89 | 84 | 80 | 83 | 79 | 77 |
| PsE | D | 89 | 84 | 80 | 83 | 79 | 77 |
| Pt | D | 89 | 84 | 80 | 83 | 79 | 77 |
| Pu | D | 89 | 84 | 80 | 83 | 79 | 77 |
| RhD | D | 89 | 84 | 80 | 83 | 79 | 77 |
| RoF | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| RpC | B | 79 | 69 | 61 | 66 | 60 | 55 |
| RrE | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| RsF | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| ScB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| SmE | AB | 74 | 59 | 50 | 56 | 48 | 40 |
| SnE | D | 89 | 84 | 80 | 83 | 79 | 77 |
| TaA | B | 79 | 69 | 61 | 66 | 60 | 55 |
| TaB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| TfB | B | 79 | 69 | 61 | 66 | 60 | 55 |
| W | WATER | | | | | | |
| ZcC | BD | 84 | 77 | 71 | 75 | 70 | 66 |
| ZnE | B | 79 | 69 | 61 | 66 | 60 | 55 |

1) From Hydrologic Analysis and Design, Richard H. McCuen, 1941

2) NRCS Soil Survey geographic data (Niobrara County, WY; Custer County, and Fall River County, SD)

# Attachment 2.7-M-2

# HEC-RAS Channel 01

| 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) | |
| 1 | 10250 | PF 1 | 1490 | 3632 | 3636.54 | 3636.13 | 3637.09 | 0.005756 | 6.28 | 271.61 | 153.86 | 0.67 |
| 1 | 10000 | PF 1 | 1490 | 3632 | 3635.47 | | 3635.87 | 0.004225 | 5.22 | 311.3 | 165.14 | 0.57 |
| 1 | 9750 | PF 1 | 1490 | 3629.82 | 3634.27 | | 3634.72 | 0.005681 | 5.64 | 314.54 | 265.19 | 0.65 |
| 1 | 9533.565 | PF 1 | 1490 | 3628 | 3632.97 | | 3633.51 | 0.006128 | 5.98 | 259.87 | 134.23 | 0.68 |
| 1 | 9250 | PF 1 | 1490 | 3626.97 | 3632.36 | | 3632.74 | 0.003418 | 5 | 311.26 | 130.66 | 0.52 |
| 1 | 9196.917 | PF 1 | 1490 | 3626.64 | 3631.37 | 3631.37 | 3632.36 | 0.013013 | 8.03 | 190.42 | 104.44 | 0.97 |
| 1 | 9053.041 | PF 1 | 1490 | 3626 | 3630.53 | 3629.63 | 3630.87 | 0.003531 | 4.89 | 335.44 | 177.71 | 0.52 |
| 1 | 8865.1 | PF 1 | 1490 | 3626 | 3630.05 | | 3630.3 | 0.003659 | 4.69 | 392.29 | 237.98 | 0.52 |
| 1 | 8448.63 | PF 1 | 1490 | 3624 | 3628 | 3627.79 | 3628.87 | 0.010589 | 7.51 | 199.98 | 92.42 | 0.88 |
| 1 | 8228.005 | PF 1 | 1490 | 3622.91 | 3626.43 | | 3627.07 | 0.00842 | 6.81 | 240.67 | 126.15 | 0.79 |
| 1 | 8000 | PF 1 | 1490 | 3621.77 | 3625.46 | | 3625.79 | 0.003841 | 4.81 | 327.97 | 151.44 | 0.54 |
| 1 | 7750 | PF 1 | 1490 | 3620.96 | 3624.36 | | 3624.76 | 0.005057 | 5.37 | 326.95 | 228.57 | 0.61 |
| 1 | 7527.247 | PF 1 | 1490 | 3620.19 | 3622.71 | | 3623.3 | 0.010058 | 6.48 | 247.25 | 158.25 | 0.83 |
| 1 | 7250 | PF 1 | 1490 | 3616.93 | 3619.95 | 3619.82 | 3620.65 | 0.010608 | 7.19 | 230.44 | 136.96 | 0.87 |
| 1 | 7000 | PF 1 | 1490 | 3612.81 | 3618.32 | | 3618.99 | 0.006466 | 6.58 | 226.31 | 83.69 | 0.71 |
| 1 | 6750 | PF 1 | 1490 | 3611.34 | 3617.4 | | 3617.8 | 0.003409 | 5.06 | 297.7 | 112.95 | 0.52 |
| 1 | 6500 | PF 1 | 1490 | 3610.64 | 3616.43 | | 3616.89 | 0.004078 | 5.39 | 276.38 | 98.82 | 0.57 |
| 1 | 6250 | PF 1 | 1490 | 3609.79 | 3615.06 | 3614.31 | 3615.72 | 0.006659 | 6.51 | 229.02 | 88.28 | 0.71 |
| 1 | 6000 | PF 1 | 1490 | 3607.54 | 3612.22 | 3612.22 | 3613.44 | 0.013751 | 8.86 | 168.13 | 70.09 | 1.01 |
| 1 | 5750 | PF 1 | 1490 | 3606.17 | 3611.06 | 3610.51 | 3611.55 | 0.004632 | 5.97 | 283.01 | 132.26 | 0.61 |
| 1 | 5500 | PF 1 | 1490 | 3603.53 | 3610.01 | 3609.26 | 3610.58 | 0.004671 | 6.2 | 260.68 | 108.71 | 0.61 |
| 1 | 5250 | PF 1 | 1490 | 3602.57 | 3608.42 | 3608.07 | 3609.21 | 0.007818 | 7.22 | 218.19 | 109.99 | 0.77 |
| 1 | 5047.68 | PF 1 | 1490 | 3601.8 | 3607.43 | 3607.13 | 3607.82 | 0.005887 | 5.72 | 317.96 | 201.1 | 0.65 |
| 1 | 4750 | PF 1 | 1490 | 3600.71 | 3606.37 | | 3606.57 | 0.003232 | 4.1 | 440.69 | 293.41 | 0.48 |
| 1 | 4569.208 | PF 1 | 1490 | 3600.04 | 3605.95 | | 3606.11 | 0.002122 | 3.75 | 470.61 | 238.57 | 0.4 |
| 1 | 4250 | PF 1 | 1490 | 3598.11 | 3604.24 | 3604.09 | 3605.05 | 0.008723 | 7.44 | 217.41 | 112.76 | 0.81 |
| 1 | 4000 | PF 1 | 1490 | 3596.59 | 3602.55 | 3602.05 | 3603.16 | 0.006481 | 6.38 | 247.99 | 119.98 | 0.7 |
| 1 | 3750 | PF 1 | 1490 | 3594.69 | 3600.81 | 3600.81 | 3601.52 | 0.011977 | 7.04 | 236.23 | 183.54 | 0.9 |
| 1 | 3431.53 | PF 1 | 1490 | 3592.93 | 3597.96 | 3597.96 | 3598.1 | 0.00348 | 3.25 | 489.07 | 368.94 | 0.47 |
| 1 | 3250 | PF 1 | 1490 | 3592.11 | 3594.91 | 3595.35 | 3596.49 | 0.106241 | 11.74 | 152.97 | 272.98 | 2.33 |
| 1 | 3066.49 | PF 1 | 1490 | 3591.3 | 3594.96 | 3594.7 | 3595.2 | 0.007074 | 4.41 | 386.99 | 356.32 | 0.66 |
| 1 | 2750 | PF 1 | 1490 | 3590 | 3592.88 | 3592.82 | 3593.55 | 0.010313 | 6.94 | 239.95 | 158.3 | 0.85 |
| 1 | 2500 | PF 1 | 1490 | 3588.13 | 3590.45 | 3590.45 | 3590.91 | 0.012119 | 6.12 | 294.23 | 303.8 | 0.88 |
| 1 | 2250 | PF 1 | 1490 | 3584.6 | 3586.02 | 3585.35 | 3586.29 | 0.004074 | 0.97 | 370.81 | 253.37 | 0.37 |
| 1 | 2103.108 | PF 1 | 1490 | 3584 | 3585.95 | | 3586 | 0.000843 | 1.92 | 789.05 | 416.09 | 0.24 |
| 1 | 1951.923 | PF 1 | 1490 | 3584 | 3585.09 | 3585.09 | 3585.63 | 0.018315 | 5.52 | 253.56 | 245.61 | 1 |
| 1 | 1750 | PF 1 | 1490 | 3579.24 | 3580.01 | 3580.01 | 3580.01 | 0.000056 | 0.17 | 2809.01 | 1328.6 | 0.05 |
| 1 | 1500 | PF 1 | 1490 | 3577.76 | 3578.54 | 3578.01 | 3578.57 | 0.000797 | 0.96 | 1219.04 | 1296.87 | 0.2 |
| 1 | 1250 | PF 1 | 1490 | 3576.75 | 3578.4 | 3578.01 | 3578.42 | 0.000498 | 1.09 | 1439.29 | 1284.67 | 0.17 |
| 1 | 1000 | PF 1 | 1490 | 3576 | 3577.97 | 3577.2 | 3578.17 | 0.00296 | 3.55 | 422.62 | 231.29 | 0.45 |
| 1 | 774.841 | PF 1 | 1490 | 3573.26 | 3576.18 | 3576.1 | 3576.91 | 0.012682 | 6.84 | 217.95 | 128.14 | 0.92 |
| 1 | 500 | PF 1 | 1490 | 3570 | 3573.81 | 3573.22 | 3574.48 | 0.007109 | 6.57 | 226.8 | 90.58 | 0.73 |
| 1 | 250 | PF 1 | 1490 | 3568 | 3570.92 | 3570.92 | 3572.04 | 0.013773 | 8.5 | 175.22 | 78.09 | 1 |
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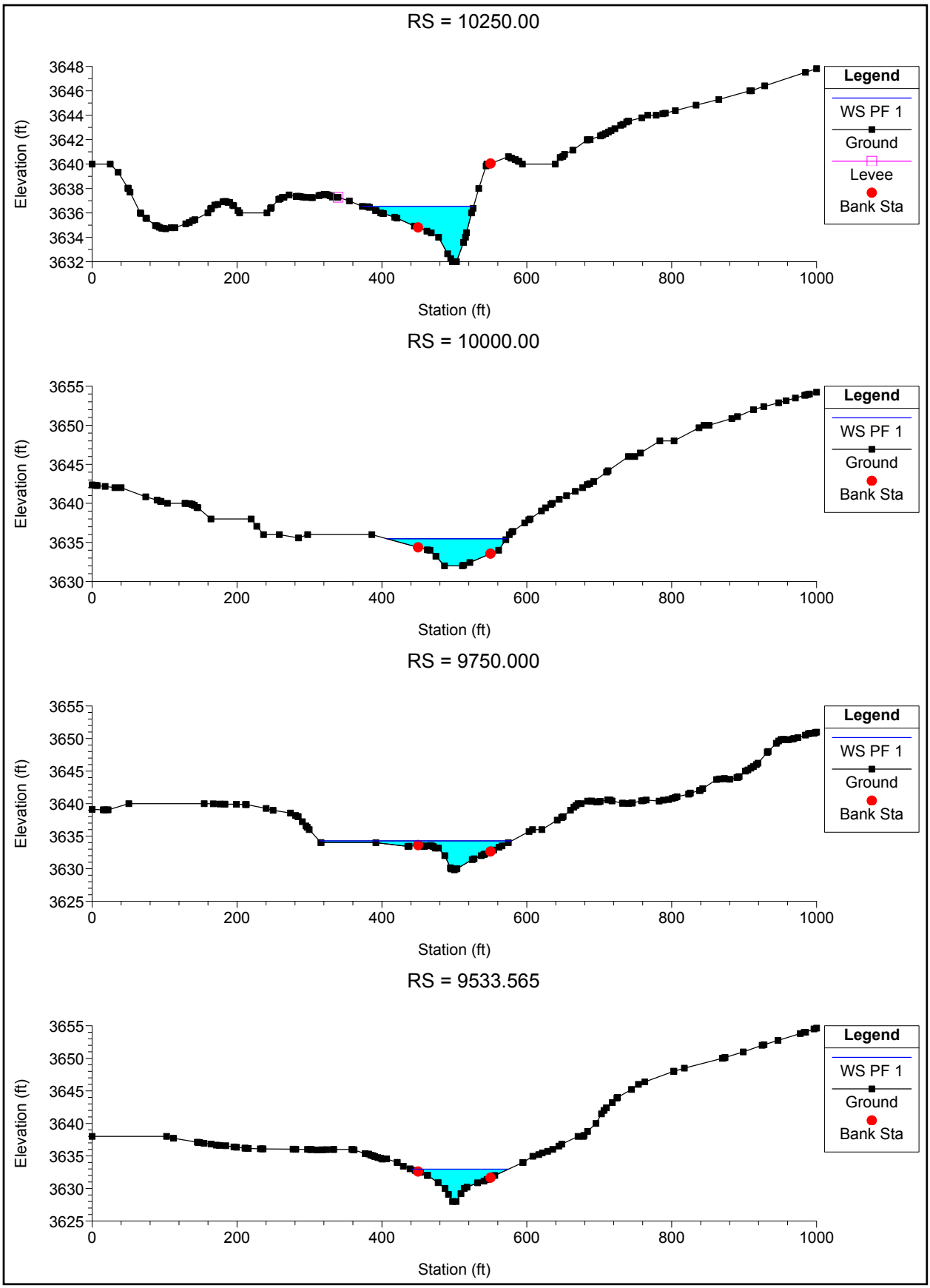
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Ground
Levee
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
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WS PF 1
Ground
Bank Sta
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Station (ft)
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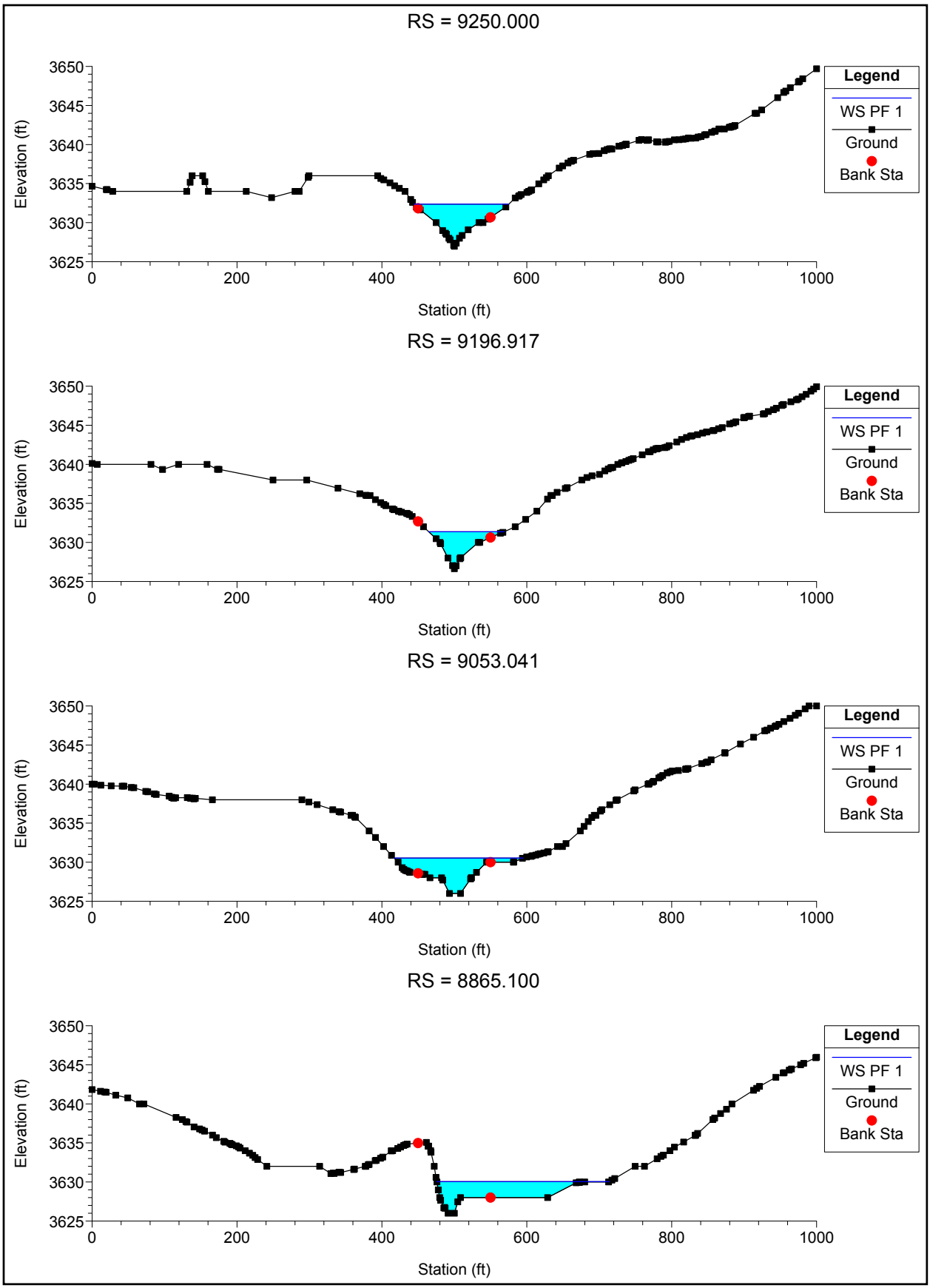
WS PF 1
Ground
Bank Sta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600
800
1000
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Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9053.041
Elevation (ft)
Station (ft)
Legend
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Ground
Bank Sta
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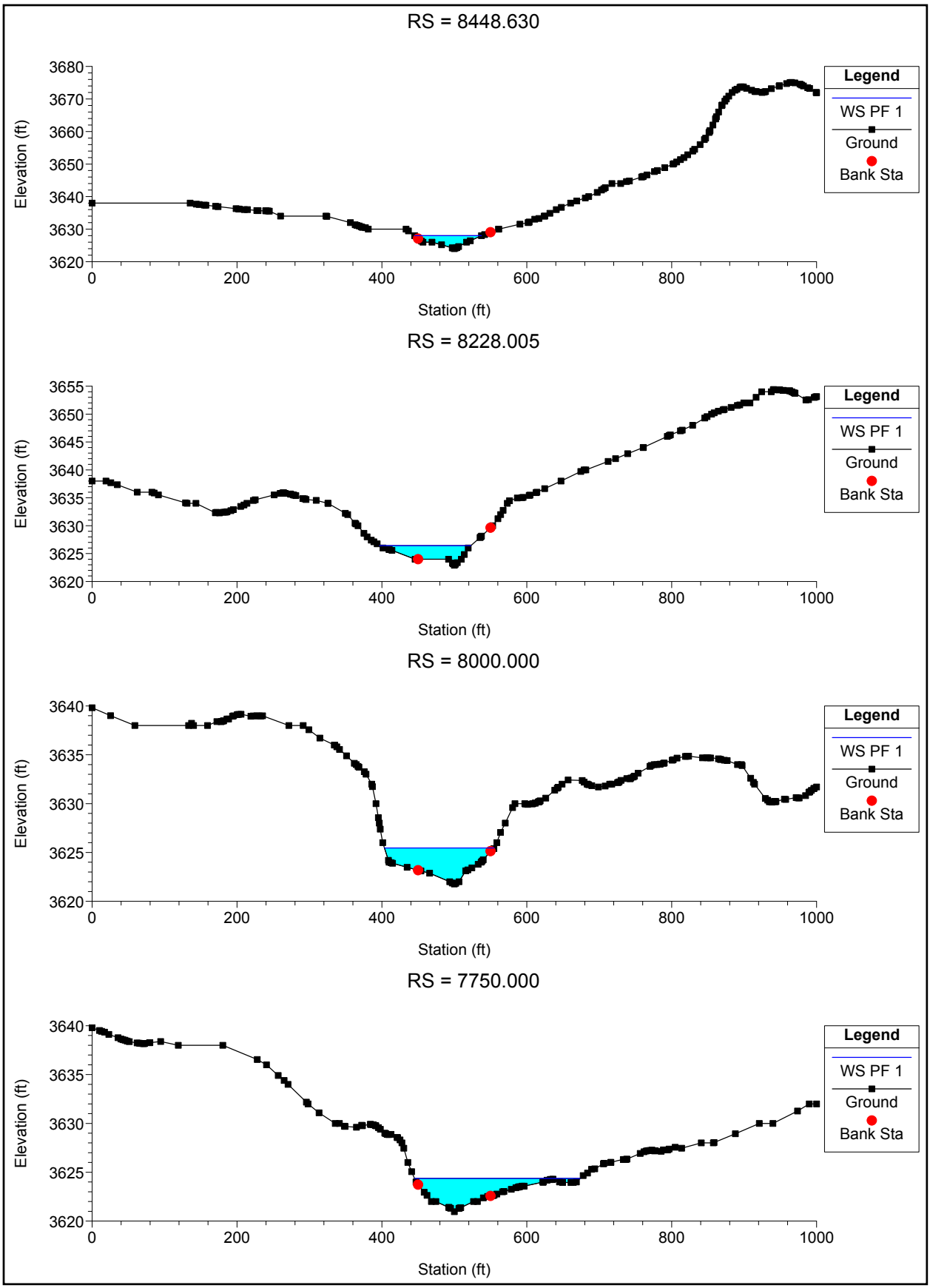
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
Station (ft)
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WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
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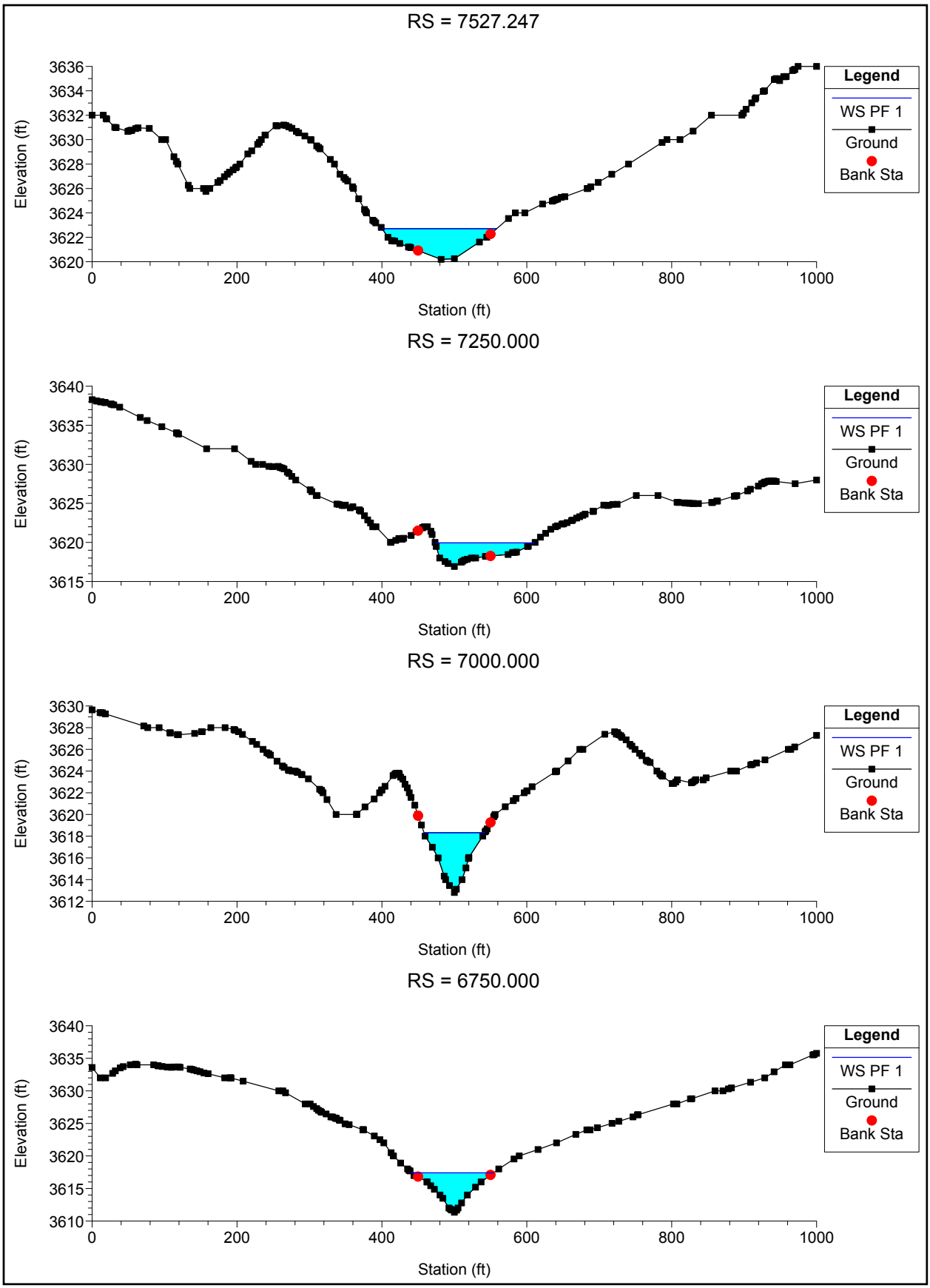
Ground
Bank Sta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Station (ft)
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Elevation (ft)
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Bank Sta
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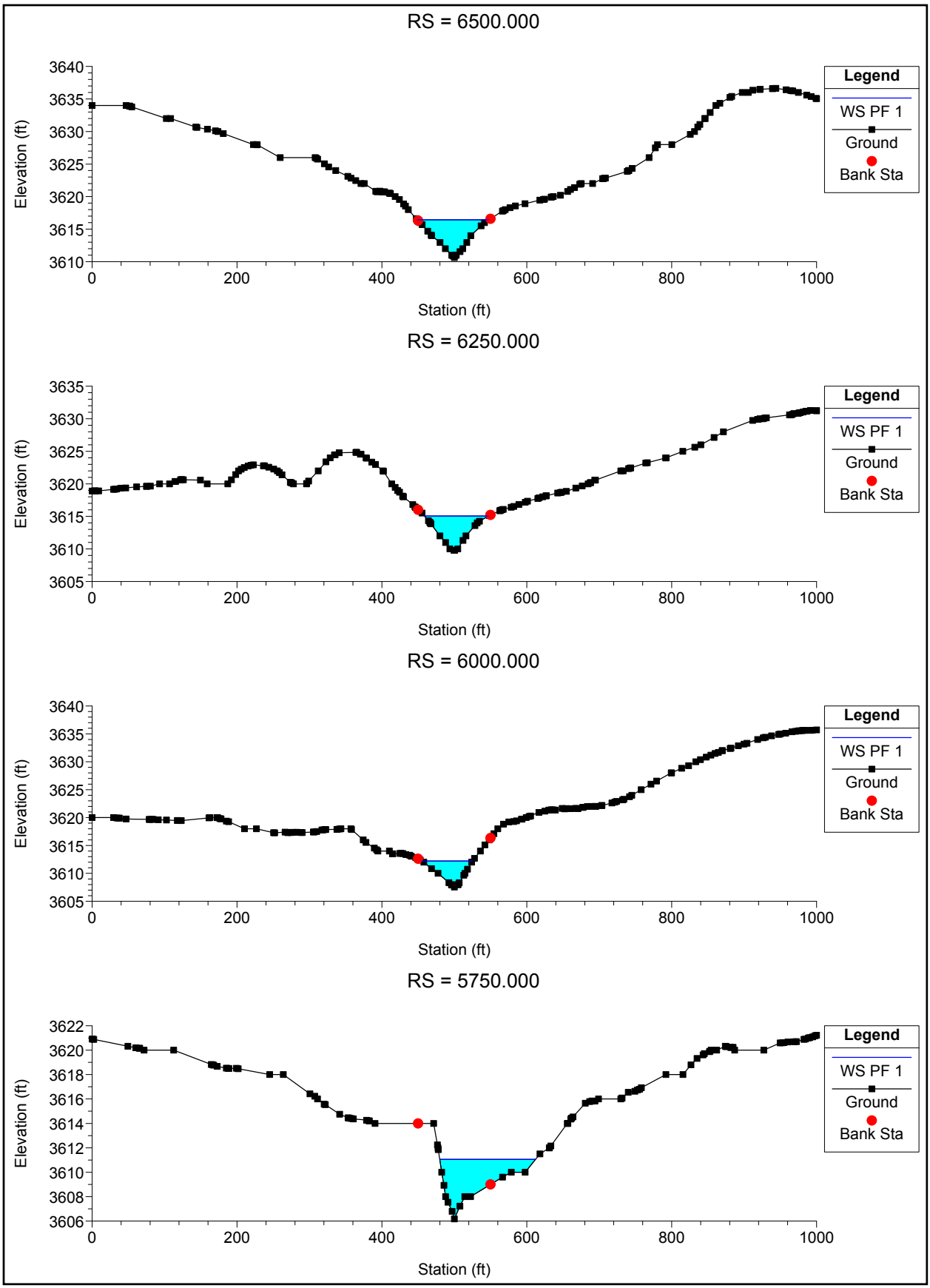
Bank Sta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Legend
WS PF 1
Ground
Bank Sta
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3630
3625
3620
3615
3610
3605
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6000.000
Elevation (ft)
3640
3635
3630
3625
3620
3615
3610
3605
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5750.000
Elevation (ft)
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3620
3618
3616
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Station (ft)
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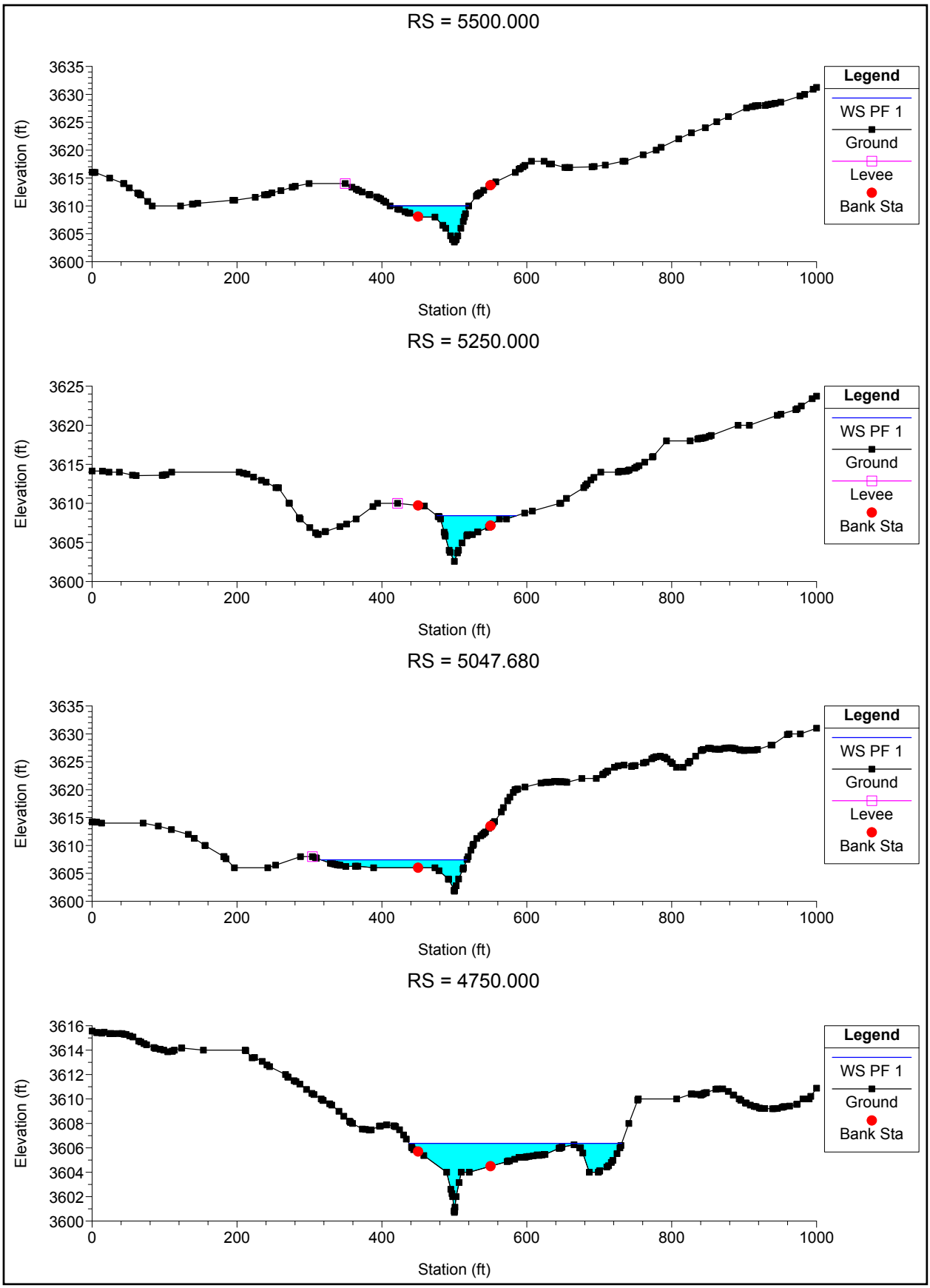
Bank Sta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Levee
Bank Sta
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Elevation (ft)
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Elevation (ft)
Station (ft)
Legend
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Levee
Bank Sta
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Station (ft)
Legend
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Ground
Bank Sta

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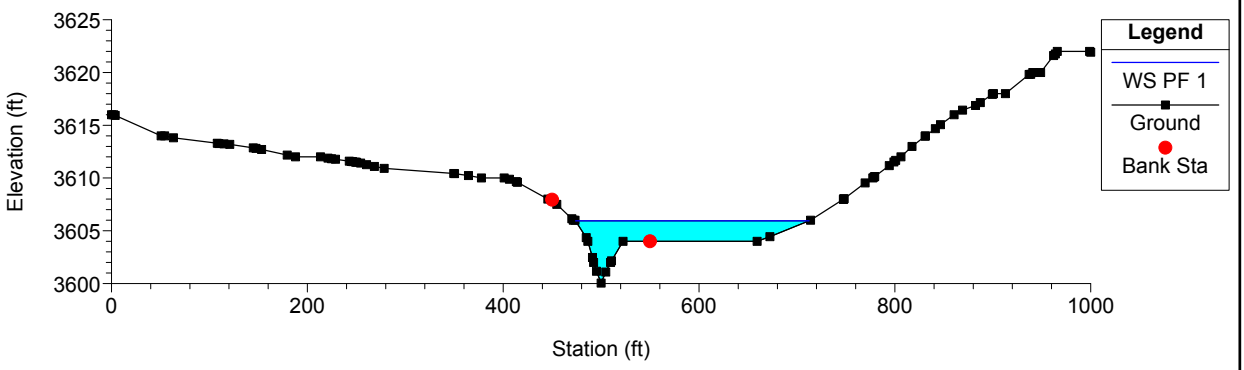


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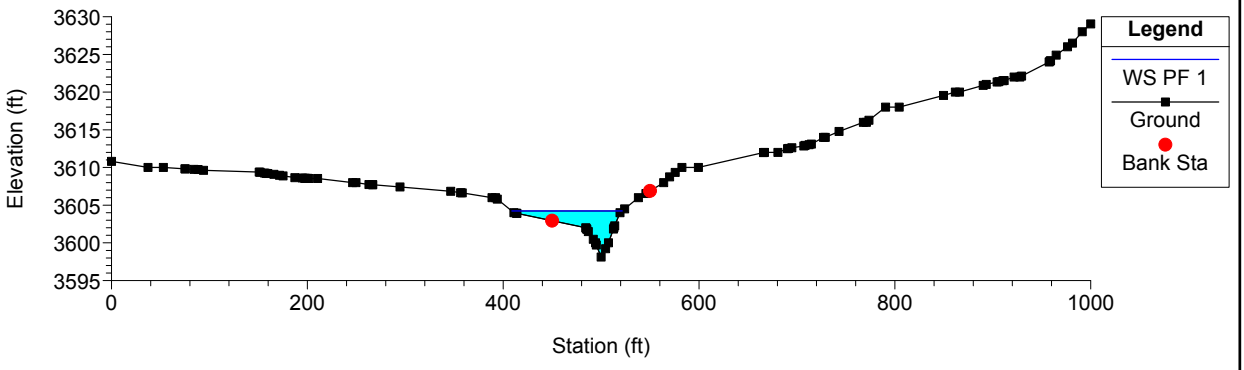


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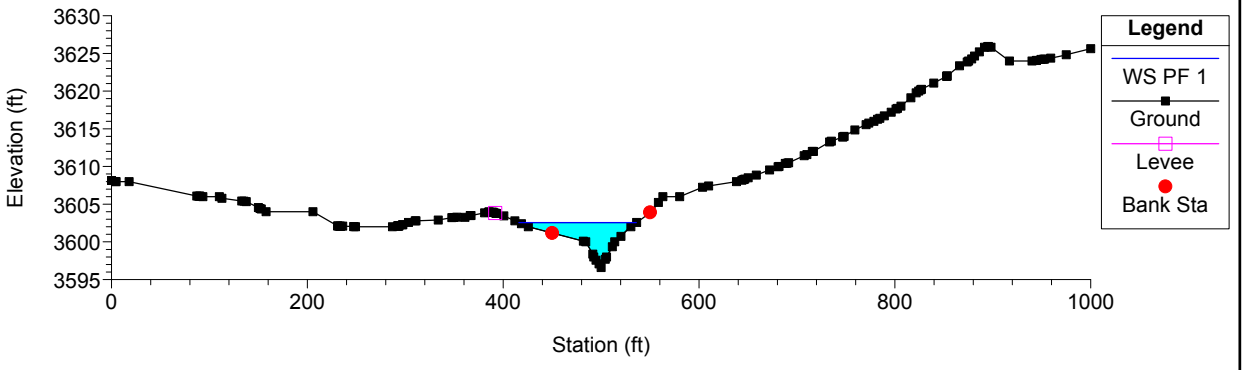


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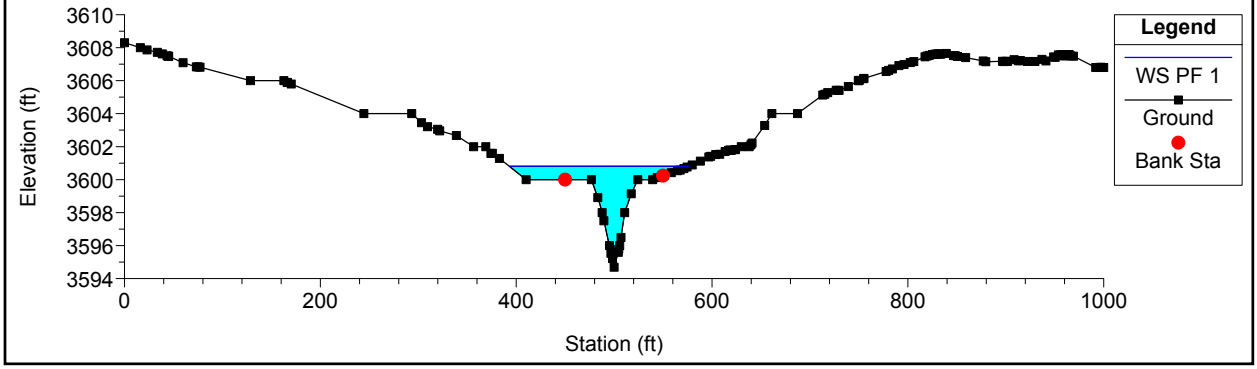

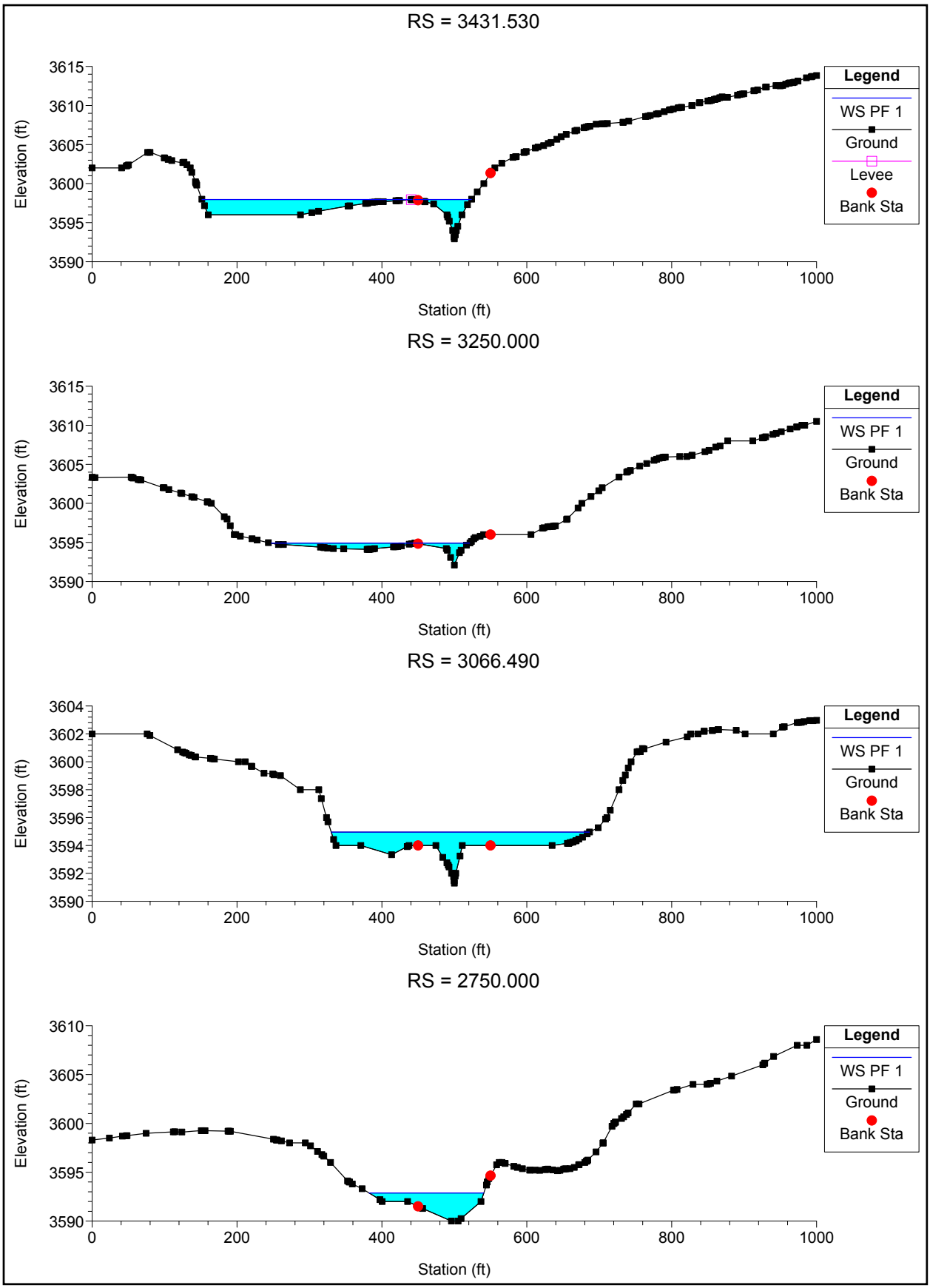
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WS PF 1
Ground
Levee
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3066.490
Elevation (ft)
Station (ft)
Legend
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Ground
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Elevation (ft)
Station (ft)
Legend
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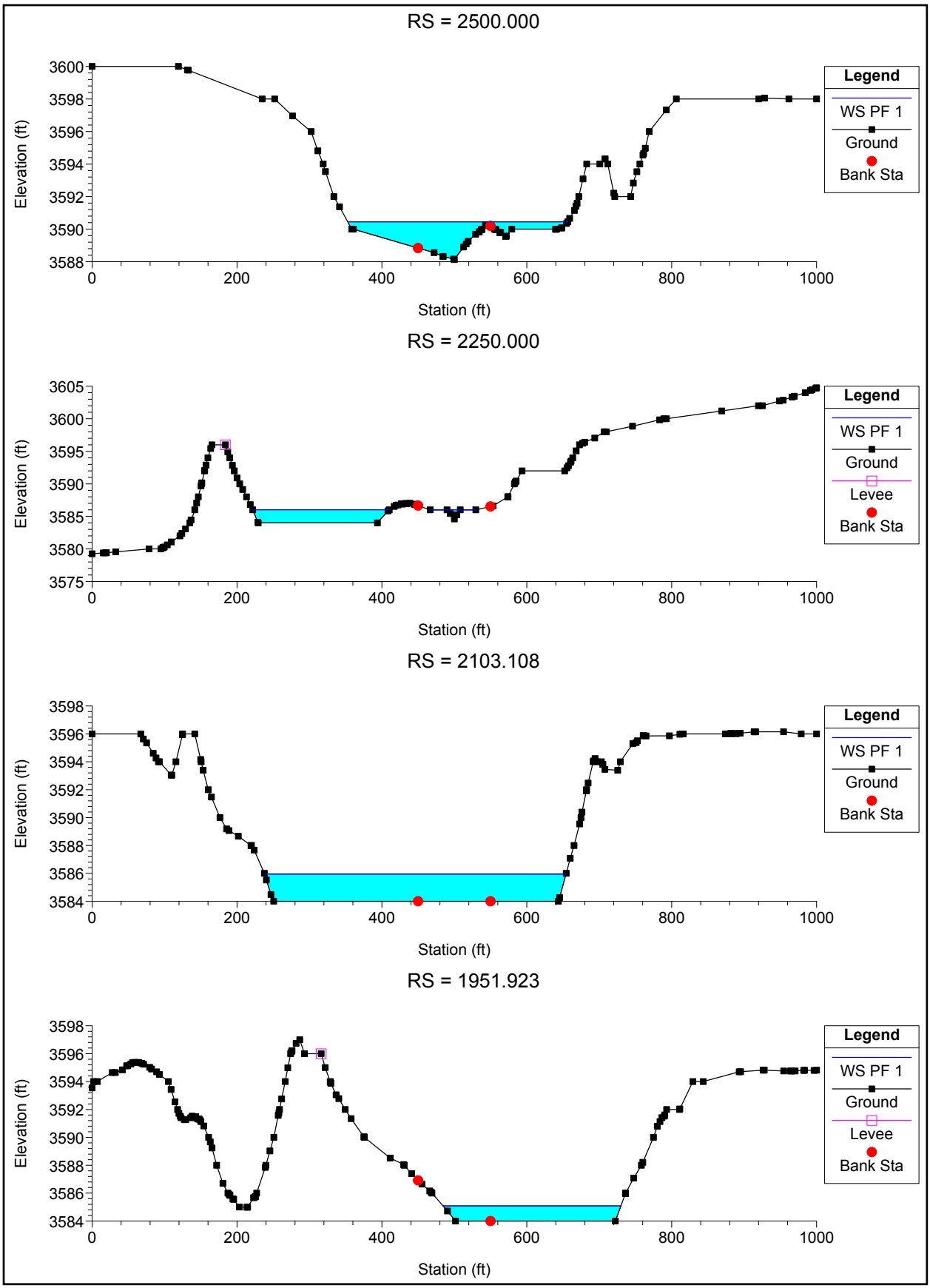
Ground
Bank Sta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Station (ft)
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WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2103.108
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
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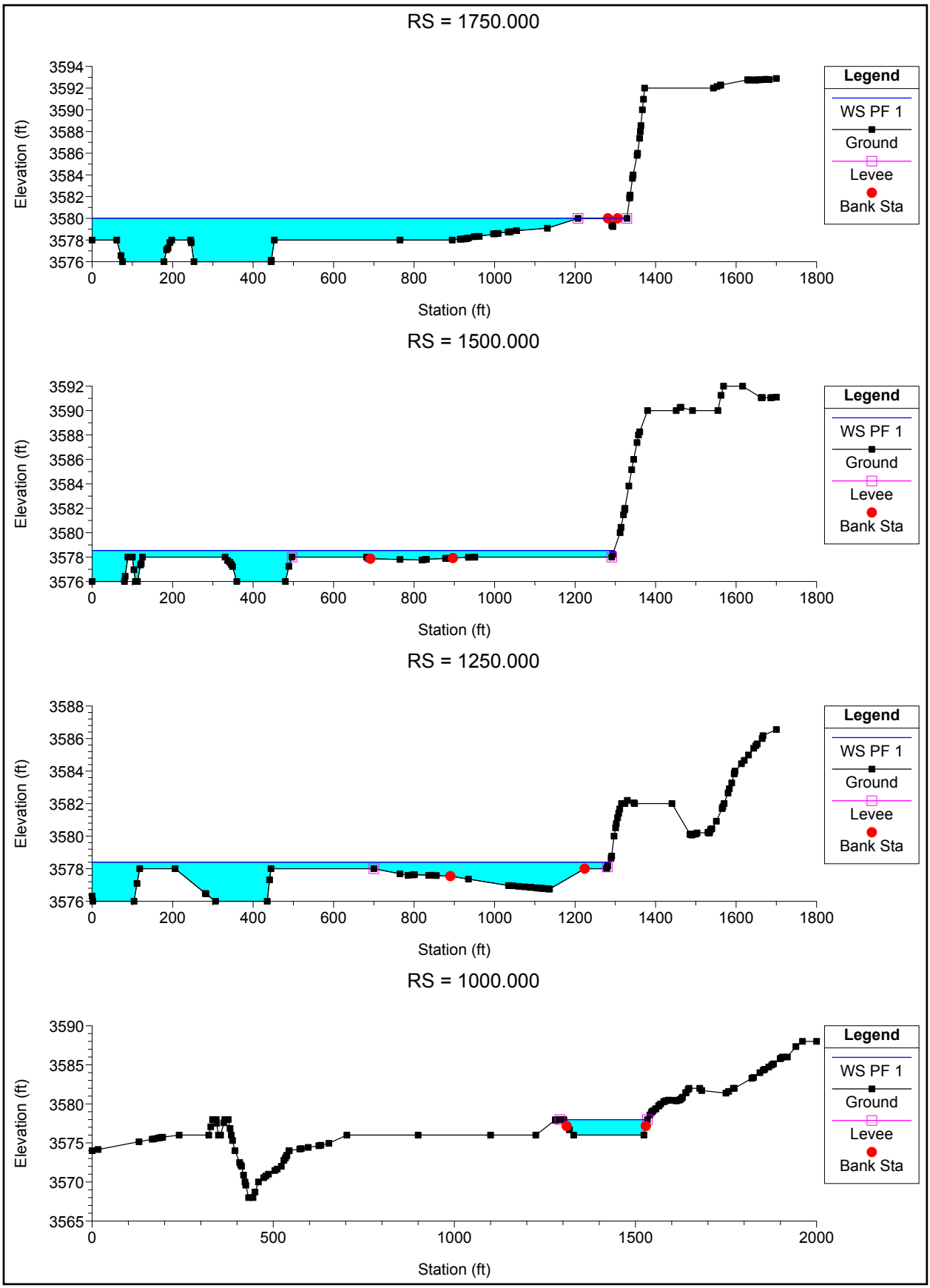
Legend
WS PF 1
Ground
Levee
Bank Sta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Levee
Bank Sta
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Elevation (ft)
Station (ft)
Legend
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Ground
Levee
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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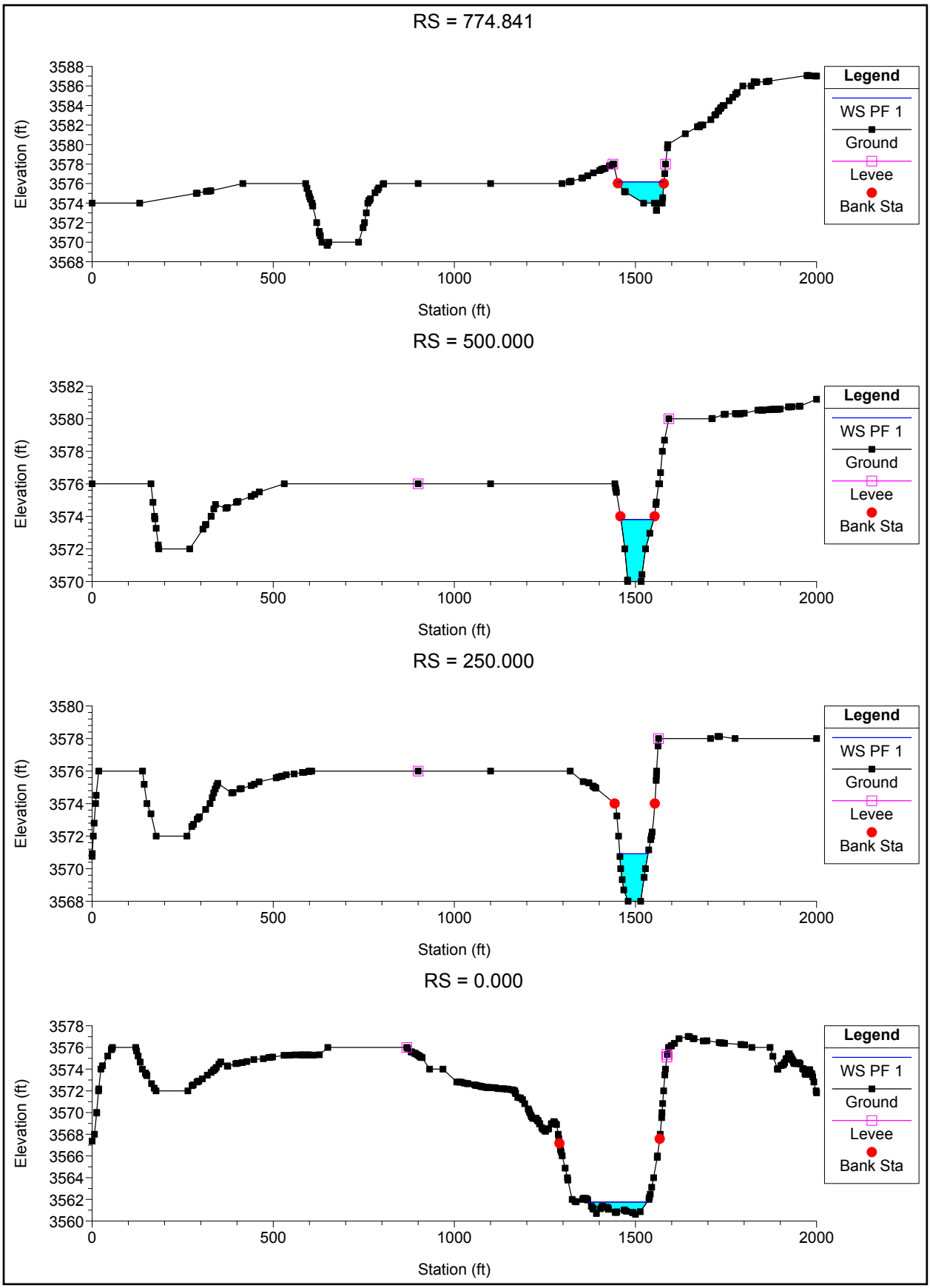
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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1000
1500
2000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
3582
3580
3578
3576
3574
3572
3570
0
500
1000
1500
2000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3580
3578
3576
3574
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3570
3568
0
500
1000
1500
2000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
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3576
3574
3572
3570
3568
3566
3564
3562
3560
0
500
1000
1500
2000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-3

# HEC-RAS Channel 02

| 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) | |
| 2 | 7250 | PF 1 | 150 | 3672.06 | 3672.44 | 3672.4 | 3672.44 | 0.000354 | 0.38 | 261.81 | 493.24 | 0.12 |
| 2 | 7000 | PF 1 | 150 | 3668.71 | 3669.45 | 3669.45 | 3669.63 | 0.021234 | 3.53 | 44.84 | 123.45 | 0.95 |
| 2 | 6750 | PF 1 | 150 | 3665.95 | 3666.09 | 3666.09 | 3666.13 | 0.005618 | 0.51 | 96.1 | 310.88 | 0.35 |
| 2 | 6500 | PF 1 | 150 | 3662.77 | 3663.6 | 3663.6 | 3663.64 | 0.00358 | 1.46 | 90.68 | 188.4 | 0.39 |
| 2 | 6273.433 | PF 1 | 150 | 3659.07 | 3660.1 | 3660.29 | 3661.02 | 0.344273 | 8.21 | 20.35 | 136.09 | 3.32 |
| 2 | 6000 | PF 1 | 150 | 3655.32 | 3656.65 | 3656.65 | 3656.98 | 0.0206 | 4.64 | 32.32 | 48.53 | 1 |
| 2 | 5750 | PF 1 | 150 | 3651.54 | 3653.22 | 3652.97 | 3653.33 | 0.006274 | 2.77 | 55.96 | 89.74 | 0.56 |
| 2 | 5500 | PF 1 | 150 | 3648.62 | 3650.55 | 3650.55 | 3650.8 | 0.02262 | 4.04 | 37.11 | 73.46 | 1 |
| 2 | 5250 | PF 1 | 150 | 3646.11 | 3648 | 3648 | 3648.04 | 0.005725 | 1.78 | 101.14 | 329.21 | 0.49 |
| 2 | 5000 | PF 1 | 150 | 3644 | 3644.03 | 3644.03 | 3644.04 | 0.000313 | 0.06 | 199.82 | 223.2 | 0.07 |
| 2 | 4750 | PF 1 | 406 | 3637.76 | 3639.17 | 3640.28 | 3642.9 | 0.152285 | 15.5 | 26.19 | 28.75 | 2.86 |
| 2 | 4500 | PF 1 | 406 | 3635.53 | 3638.01 | 3638.01 | 3638.05 | 0.002277 | 1.35 | 252.4 | 359.85 | 0.32 |
| 2 | 4250 | PF 1 | 406 | 3633.32 | 3636.42 | 3636.07 | 3636.82 | 0.008186 | 5.09 | 79.76 | 51.84 | 0.72 |
| 2 | 4075.073 | PF 1 | 406 | 3632.41 | 3634.51 | 3634.51 | 3635.06 | 0.017502 | 5.95 | 68.24 | 62.41 | 1 |
| 2 | 4000 | PF 1 | 406 | 3632.02 | 3633.73 | 3633.73 | 3633.73 | 0.000016 | 0.14 | 1214.22 | 482.1 | 0.03 |
| 2 | 3750 | PF 1 | 406 | 3628.09 | 3630.48 | 3631.15 | 3633.43 | 0.185071 | 13.78 | 29.47 | 44.5 | 2.98 |
| 2 | 3500 | PF 1 | 406 | 3623.51 | 3627.41 | 3627.07 | 3628.05 | 0.009732 | 6.42 | 63.2 | 32.3 | 0.81 |
| 2 | 3250 | PF 1 | 406 | 3620.97 | 3624.46 | 3624.46 | 3625.38 | 0.01545 | 7.69 | 52.8 | 29.1 | 1.01 |
| 2 | 2970.575 | PF 1 | 406 | 3618.3 | 3621.78 | 3620.91 | 3622.05 | 0.00378 | 4.13 | 98.2 | 48.7 | 0.51 |
| 2 | 2720.554 | PF 1 | 1077 | 3615.15 | 3619.1 | 3619.05 | 3620.14 | 0.013156 | 8.17 | 131.75 | 59.85 | 0.97 |
| 2 | 2500 | PF 1 | 1077 | 3611.91 | 3616.33 | 3616.33 | 3617.6 | 0.013688 | 9.04 | 119.13 | 47.41 | 1.01 |
| 2 | 2250 | PF 1 | 1077 | 3610.51 | 3614.71 | 3614 | 3615.24 | 0.005821 | 5.86 | 183.81 | 74.89 | 0.66 |
| 2 | 2000 | PF 1 | 1077 | 3610 | 3613.56 | 3612.72 | 3614.1 | 0.005337 | 5.91 | 182.32 | 68.58 | 0.64 |
| 2 | 1750 | PF 1 | 1077 | 3607.51 | 3610.9 | 3610.9 | 3612.07 | 0.013431 | 8.67 | 124.28 | 52.43 | 0.99 |
| 2 | 1500 | PF 1 | 1077 | 3602.07 | 3606.01 | 3606.57 | 3608.07 | 0.02613 | 11.51 | 93.57 | 42.22 | 1.36 |
| 2 | 1250 | PF 1 | 1077 | 3599.31 | 3603.73 | 3603.63 | 3604.82 | 0.012308 | 8.36 | 128.88 | 53.78 | 0.95 |
| 2 | 1000 | PF 1 | 1077 | 3597.97 | 3601.16 | 3601.05 | 3601.91 | 0.010459 | 7.22 | 161.46 | 92 | 0.86 |
| 2 | 750 | PF 1 | 1077 | 3595.26 | 3600.08 | 3599.16 | 3600.41 | 0.004925 | 4.81 | 244.08 | 150.77 | 0.59 |
| 2 | 500 | PF 1 | 1077 | 3593.19 | 3597.7 | 3597.7 | 3598.83 | 0.014289 | 8.51 | 126.55 | 57.36 | 1.01 |
| 2 | 250 | PF 1 | 1077 | 3588.35 | 3592.47 | 3593.13 | 3594.7 | 0.031698 | 11.98 | 89.93 | 43.86 | 1.47 |
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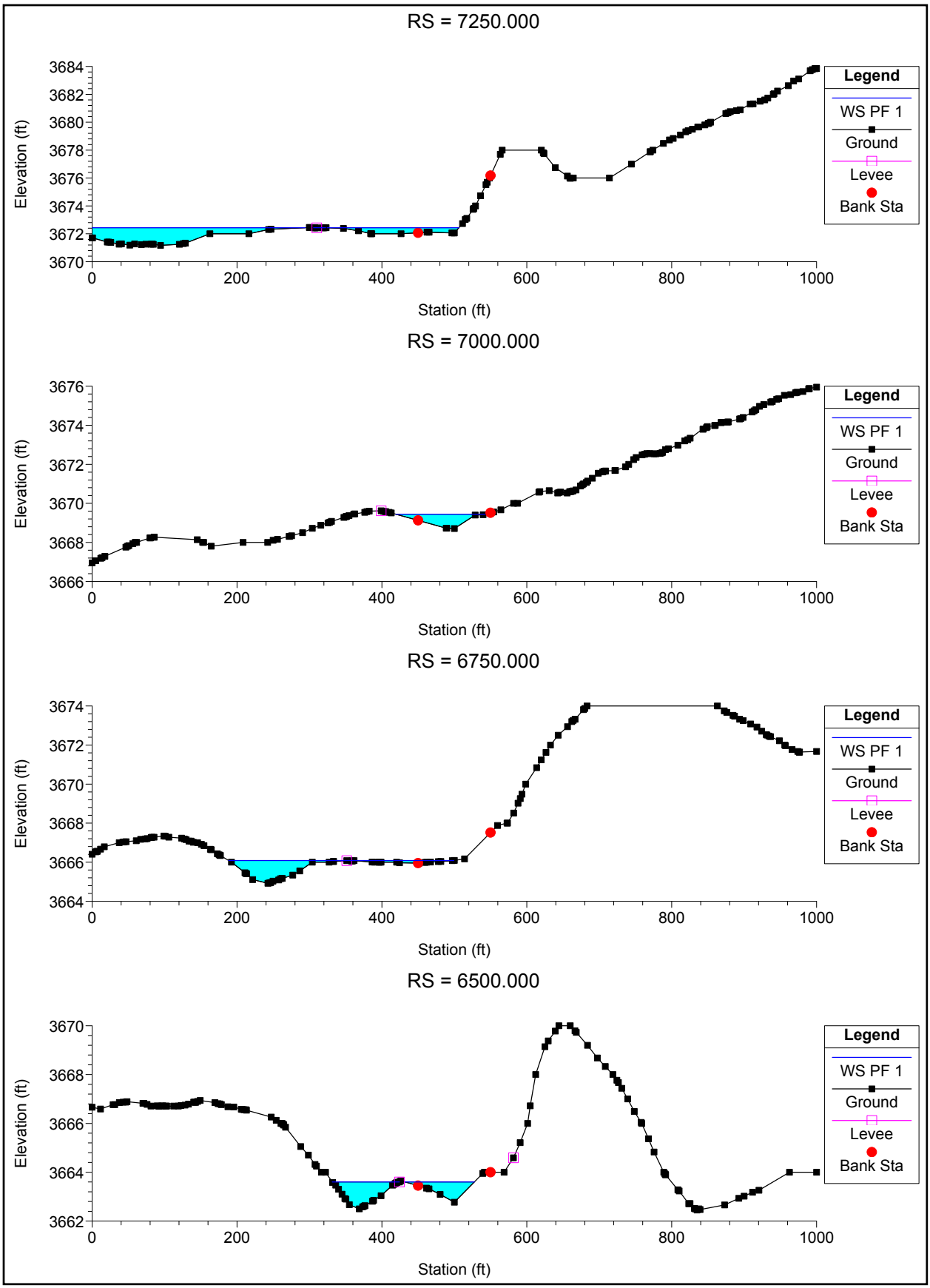
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800
1000
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Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7000.000
Elevation (ft)
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3674
3672
3670
3668
3666
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6750.000
Elevation (ft)
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3672
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3670
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Station (ft)
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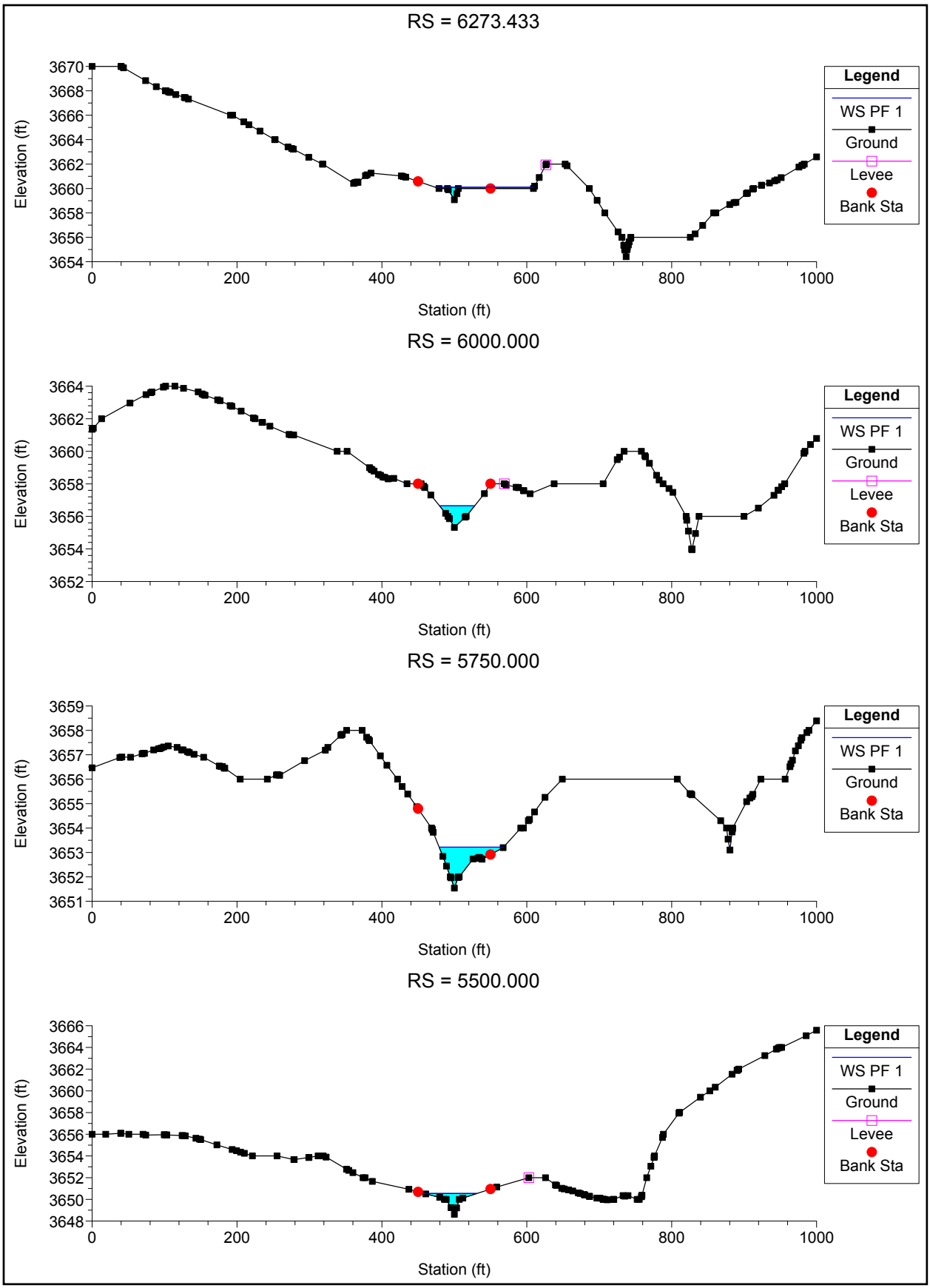
Ground
Levee
Bank Sta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WS PF 1
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Levee
Bank Sta
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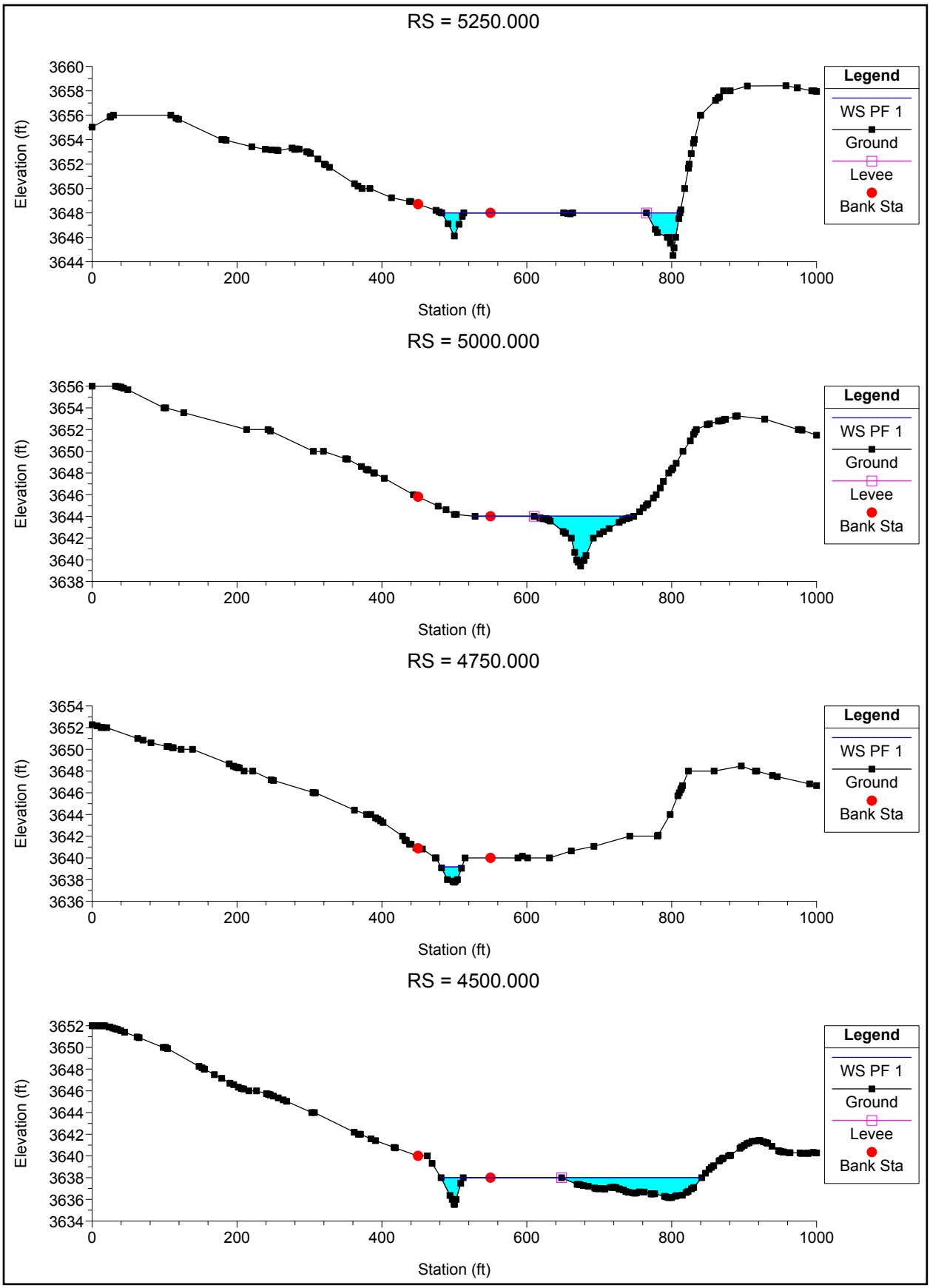
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
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WS PF 1
Ground
Levee
Bank Sta
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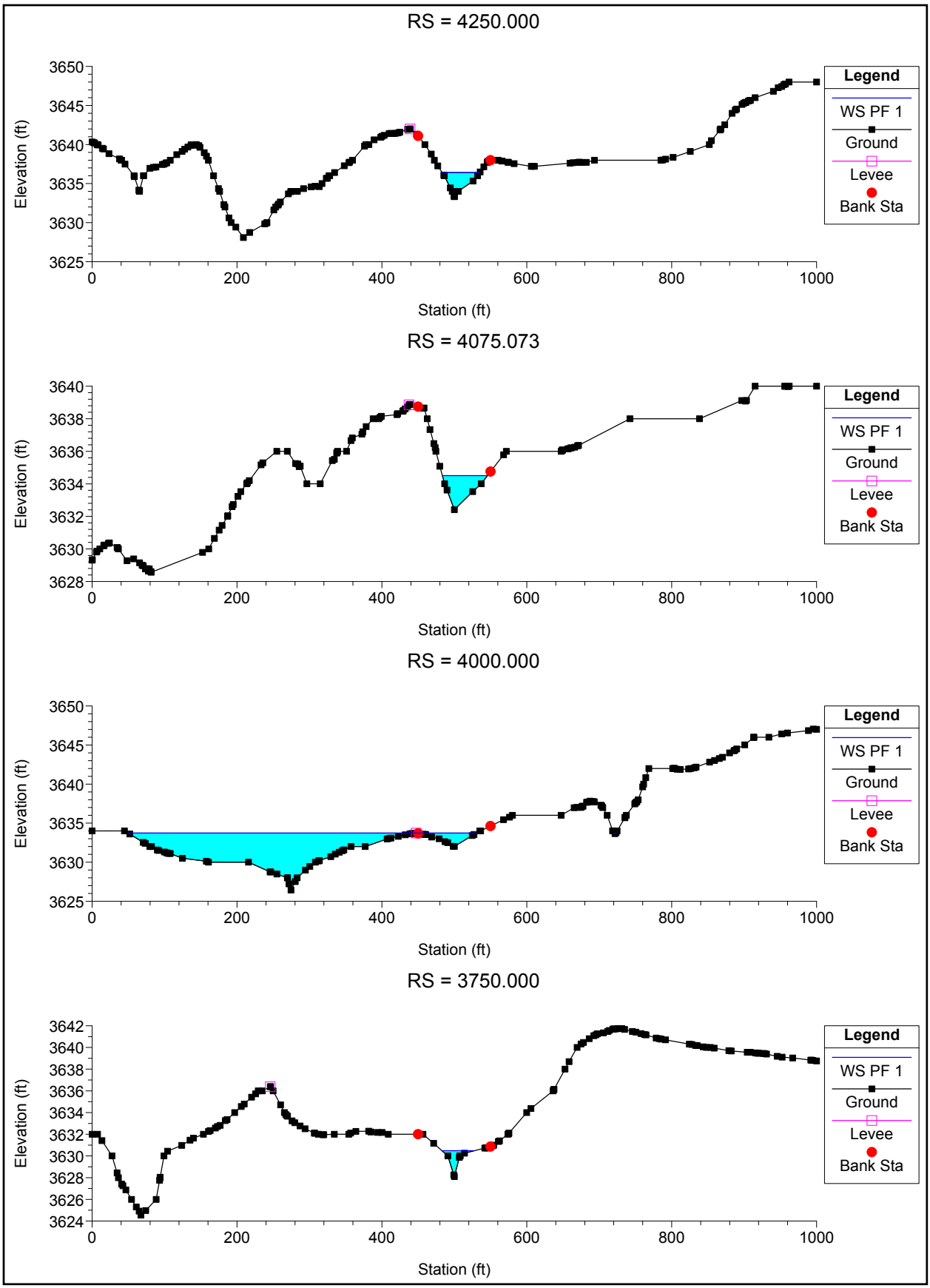
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3645
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3635
3630
3625
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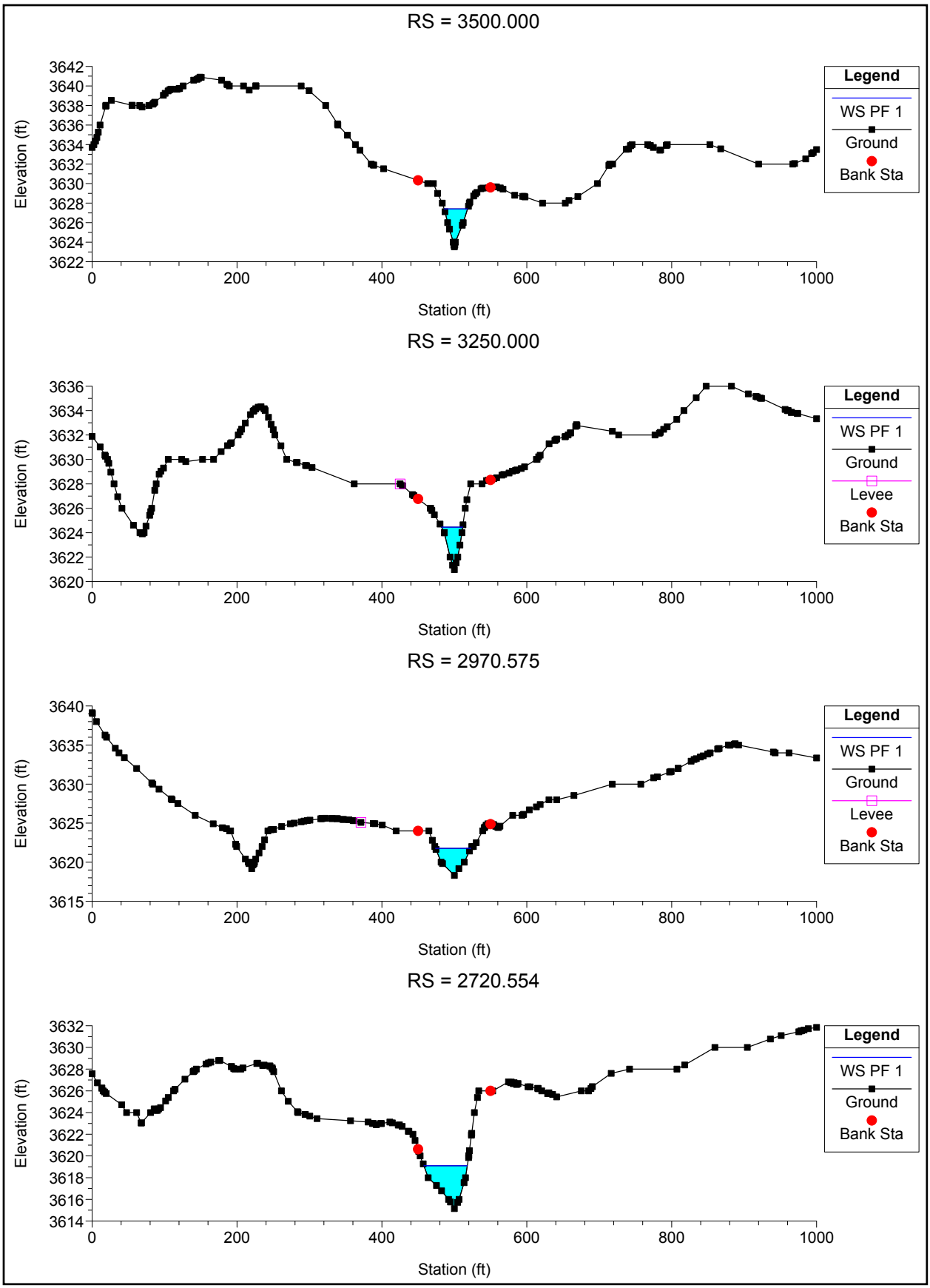
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4075.073
Elevation (ft)
3640
3638
3636
3634
3632
3630
3628
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4000.000
Elevation (ft)
3650
3645
3640
3635
3630
3625
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3750.000
Elevation (ft)
3642
3640
3638
3636
3634
3632
3630
3628
3626
3624
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Ground
Bank Sta
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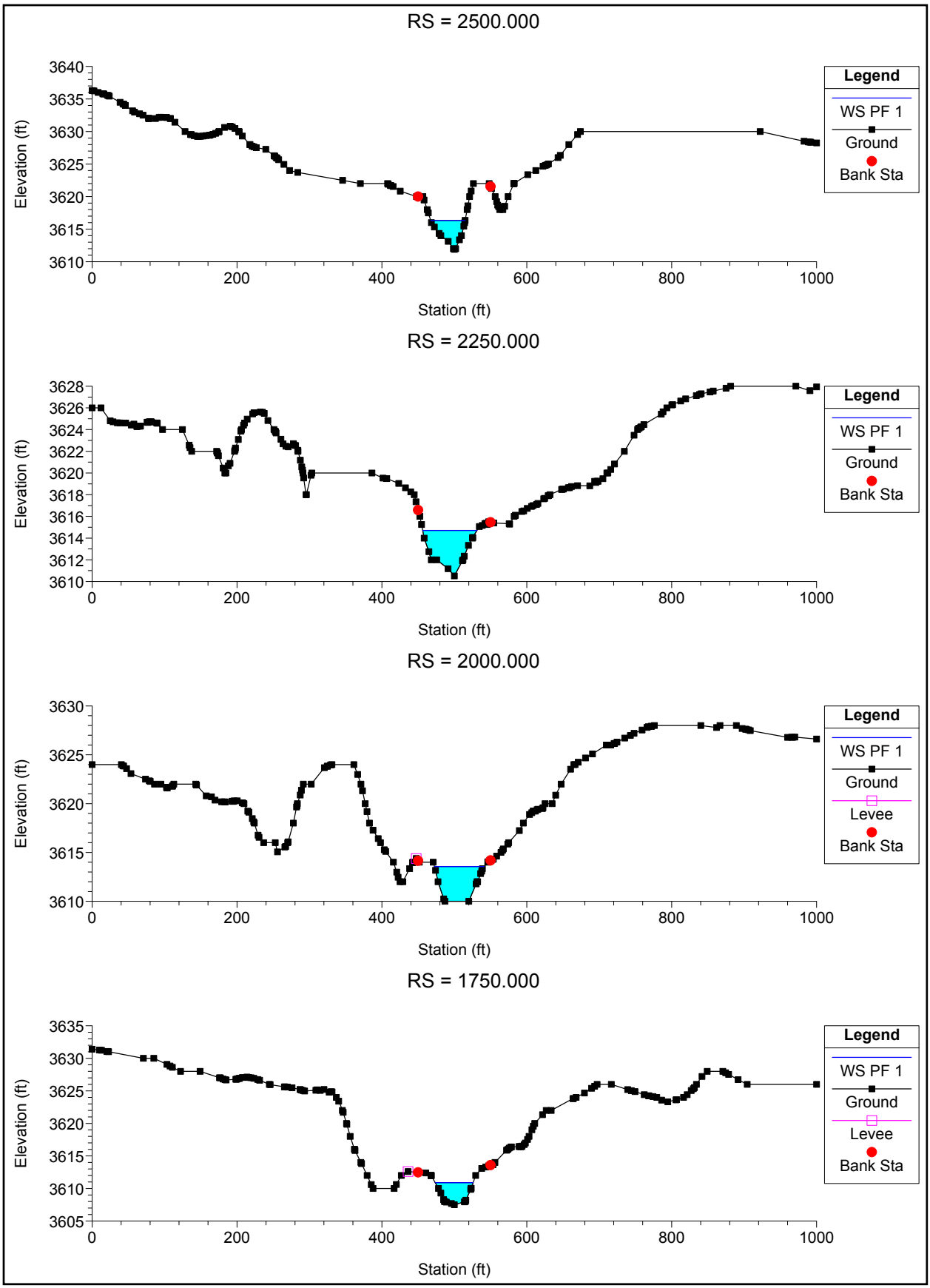
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2970.575
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2720.554
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3625
3620
3615
3610
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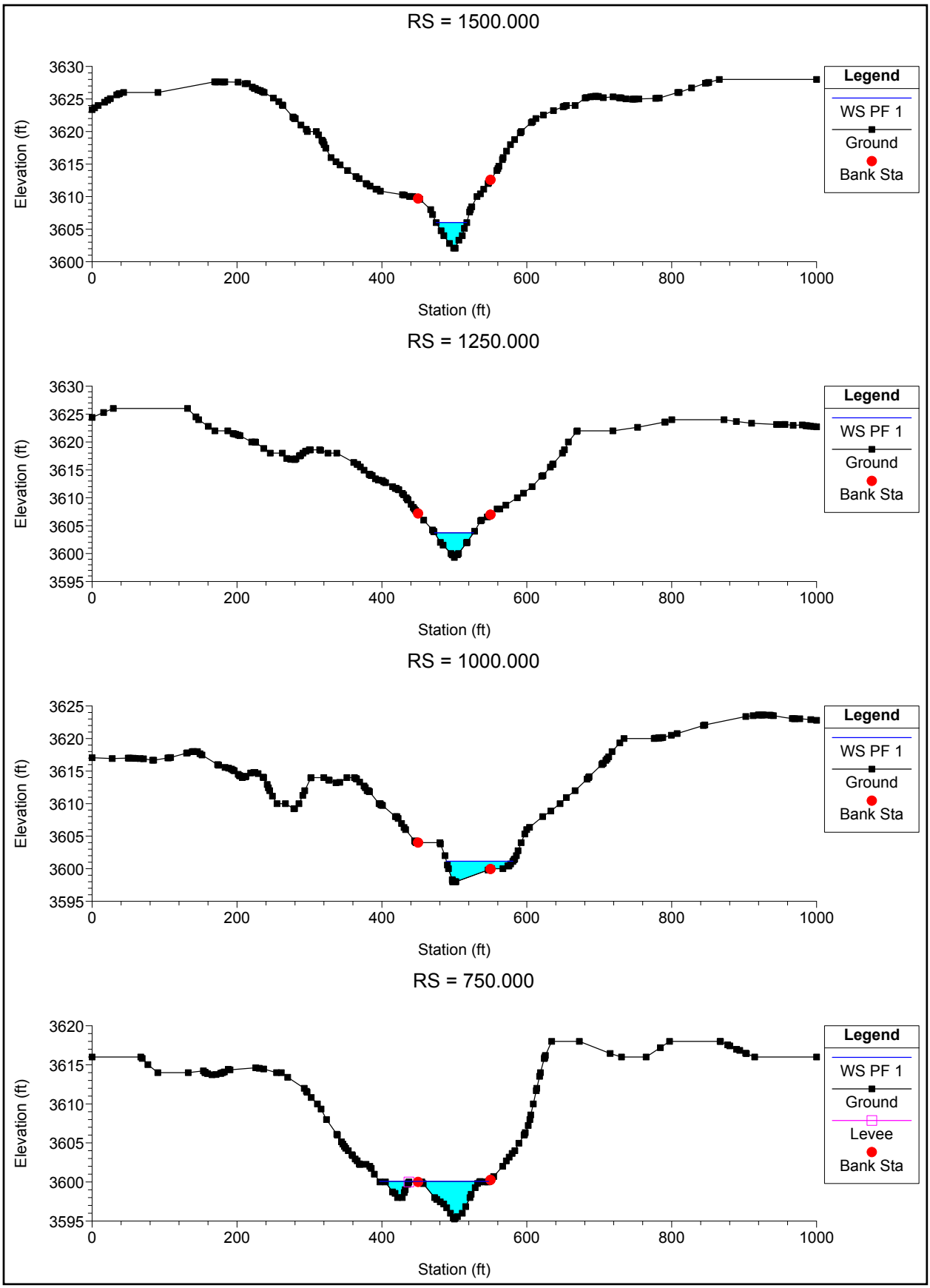
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3628
3626
3624
3622
3620
3618
3616
3614
3612
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
3630
3625
3620
3615
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
3635
3630
3625
3620
3615
3610
3605
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3620
3615
3610
3605
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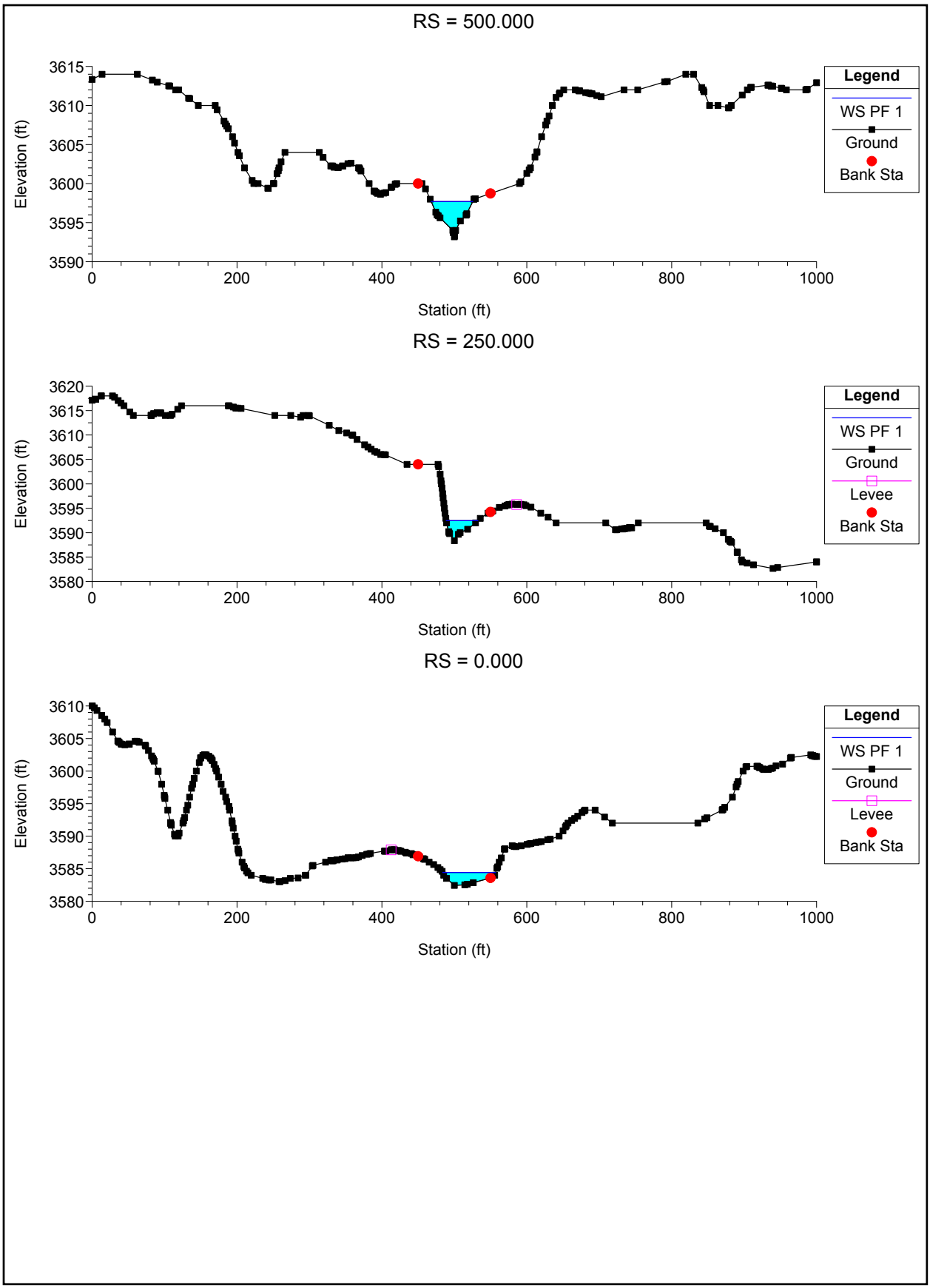
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
3630
3625
3620
3615
3610
3605
3600
3595
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3625
3620
3615
3610
3605
3600
3595
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
3620
3615
3610
3605
3600
3595
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3600
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3590
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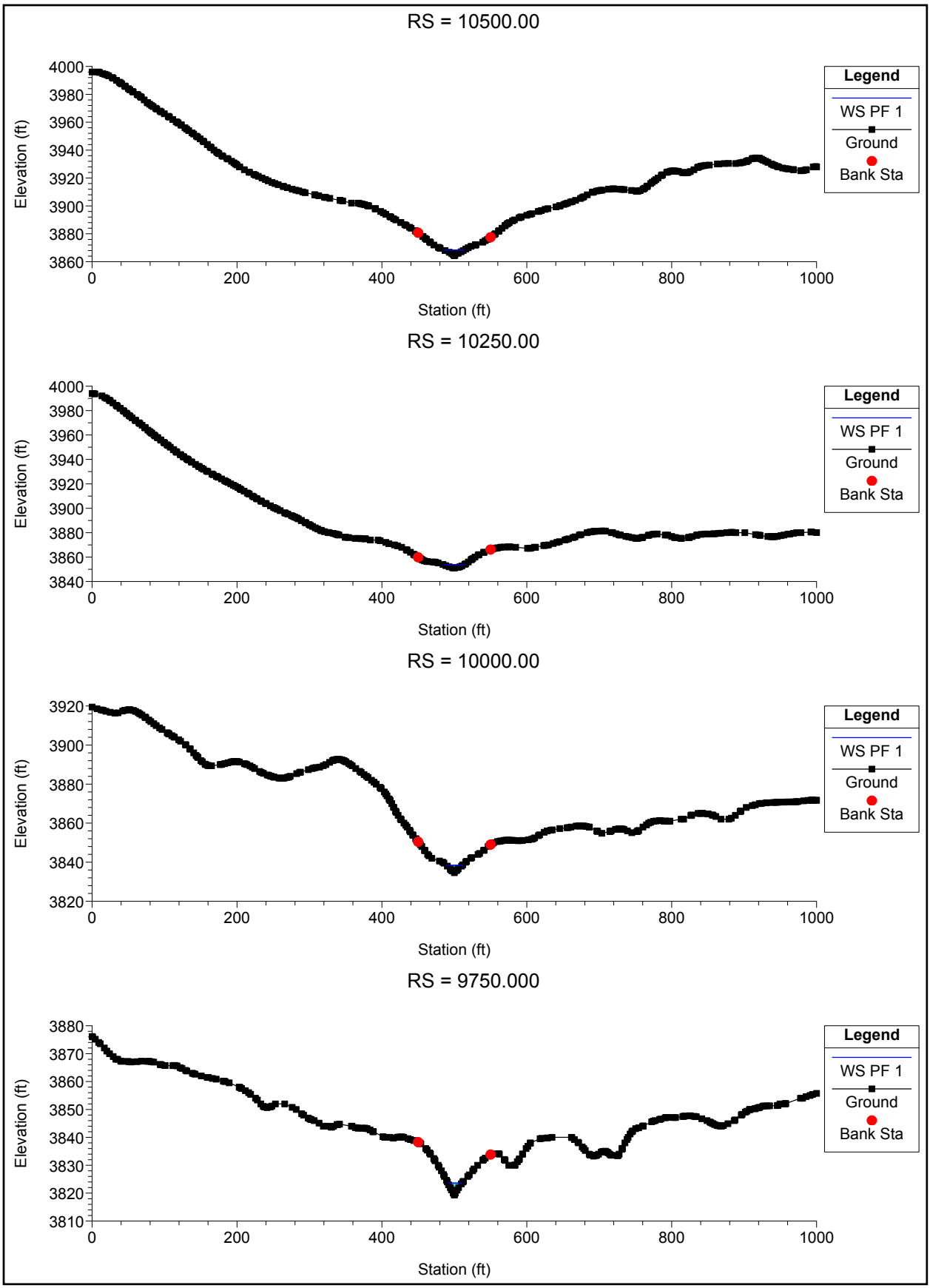
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3620
3615
3610
3605
3600
3595
3590
3585
3580
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3610
3605
3600
3595
3590
3585
3580
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-4

# HEC-RAS Channel 02A

| 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) | |
| 02A | 10500 | PF 1 | 680 | 3864.58 | 3868.28 | 3869.3 | 3871.44 | 0.056098 | 14.26 | 47.68 | 27.2 | 1.9 |
| 02A | 10250 | PF 1 | 680 | 3850.99 | 3853.72 | 3854.82 | 3857.28 | 0.070066 | 15.14 | 44.91 | 28.13 | 2.11 |
| 02A | 10000 | PF 1 | 680 | 3834.6 | 3838.44 | 3839.71 | 3842.46 | 0.065384 | 16.09 | 42.27 | 22.13 | 2.05 |
| 02A | 9750 | PF 1 | 680 | 3819.37 | 3823.61 | 3825.01 | 3828 | 0.066561 | 16.83 | 40.4 | 19.4 | 2.06 |
| 02A | 9500 | PF 1 | 680 | 3809.04 | 3812.15 | 3812.98 | 3814.7 | 0.053934 | 12.79 | 53.15 | 35.29 | 1.84 |
| 02A | 9230.946 | PF 1 | 680 | 3798.95 | 3801.56 | 3802.21 | 3803.32 | 0.037613 | 10.65 | 63.84 | 43.03 | 1.54 |
| 02A | 9000 | PF 1 | 680 | 3792.16 | 3793.46 | 3793.89 | 3794.81 | 0.045839 | 9.52 | 74.03 | 75.84 | 1.62 |
| 02A | 8750 | PF 1 | 680 | 3783.92 | 3785.16 | 3785.44 | 3786.09 | 0.034386 | 7.9 | 90.04 | 104.82 | 1.39 |
| 02A | 8552.188 | PF 1 | 680 | 3772.17 | 3774.8 | 3775.94 | 3777.59 | 0.054147 | 13.38 | 50.81 | 31.66 | 1.86 |
| 02A | 8250 | PF 1 | 680 | 3761.76 | 3762.93 | 3763.18 | 3763.84 | 0.040336 | 7.74 | 89.84 | 110.01 | 1.47 |
| 02A | 8000 | PF 1 | 680 | 3751.88 | 3753 | 3753.27 | 3753.95 | 0.039408 | 8.22 | 88.23 | 103.21 | 1.48 |
| 02A | 7750 | PF 1 | 680 | 3741.01 | 3744.12 | 3744.73 | 3745.82 | 0.03493 | 10.46 | 65.01 | 42.46 | 1.49 |
| 02A | 7500 | PF 1 | 680 | 3733.39 | 3735.89 | 3736.29 | 3737.25 | 0.033442 | 9.35 | 72.75 | 54.83 | 1.43 |
| 02A | 7250 | PF 1 | 680 | 3725.88 | 3729.52 | 3729.74 | 3730.48 | 0.022685 | 7.89 | 87.64 | 72.51 | 1.18 |
| 02A | 7000 | PF 1 | 680 | 3718.79 | 3720.93 | 3721.41 | 3722.47 | 0.050596 | 9.98 | 68.78 | 67.65 | 1.7 |
| 02A | 6750 | PF 1 | 680 | 3712.89 | 3715.19 | 3715.23 | 3715.95 | 0.017891 | 7.01 | 96.99 | 70.5 | 1.05 |
| 02A | 6500 | PF 1 | 680 | 3709.94 | 3711.62 | 3711.62 | 3711.93 | 0.009683 | 3.78 | 153.92 | 147.59 | 0.72 |
| 02A | 6226.932 | PF 1 | 680 | 3700.24 | 3702.98 | 3703.94 | 3706.29 | 0.107916 | 14.6 | 46.56 | 42.97 | 2.47 |
| 02A | 6000 | PF 1 | 680 | 3696.1 | 3699.87 | 3699.66 | 3700.31 | 0.010564 | 5.28 | 129.66 | 109.25 | 0.8 |
| 02A | 5750 | PF 1 | 680 | 3694.52 | 3696.43 | 3696.43 | 3696.94 | 0.018433 | 5.85 | 120.47 | 125.64 | 1.02 |
| 02A | 5500 | PF 1 | 680 | 3691.47 | 3692.14 | 3692.19 | 3692.47 | 0.017817 | 2.39 | 160.32 | 315.26 | 0.8 |
| 02A | 5356.327 | PF 1 | 680 | 3689.12 | 3689.76 | 3689.76 | 3690.19 | 0.016025 | 2 | 135.78 | 183.07 | 0.74 |
| 02A | 4970.513 | PF 1 | 680 | 3683.12 | 3685.03 | 3685.08 | 3685.57 | 0.019953 | 6.05 | 118.23 | 136.94 | 1.06 |
| 02A | 4750 | PF 1 | 680 | 3680 | 3681.72 | 3681.72 | 3682.13 | 0.014451 | 5.43 | 139.98 | 183.38 | 0.91 |
| 02A | 4645.596 | PF 1 | 680 | 3680 | 3680.02 | 3680.02 | 3680.05 | 0.000927 | 0.11 | 496.49 | 522.27 | 0.12 |
| 02A | 4500 | PF 1 | 680 | 3675.54 | 3678.49 | 3678.78 | 3679.62 | 0.026622 | 8.5 | 80.04 | 58.56 | 1.28 |
| 02A | 4250 | PF 1 | 680 | 3673.83 | 3677.55 | 3676.43 | 3677.75 | 0.002409 | 3.6 | 188.67 | 82.41 | 0.42 |
| 02A | 4000 | PF 1 | 680 | 3672.92 | 3676.32 | 3675.65 | 3676.8 | 0.006482 | 5.57 | 121.99 | 57.87 | 0.68 |
| 02A | 3750 | PF 1 | 680 | 3672 | 3675.13 | 3674.34 | 3675.43 | 0.004374 | 4.45 | 152.73 | 76.11 | 0.55 |
| 02A | 3500 | PF 1 | 680 | 3668.88 | 3673.63 | 3672.91 | 3674.14 | 0.006055 | 5.75 | 118.24 | 50.51 | 0.66 |
| 02A | 3250 | PF 1 | 680 | 3665.9 | 3670.64 | 3670.64 | 3671.86 | 0.014251 | 8.86 | 76.75 | 31.74 | 1 |
| 02A | 3000 | PF 1 | 680 | 3665 | 3669.13 | 3667.54 | 3669.24 | 0.001109 | 2.81 | 275.42 | 148.95 | 0.3 |
| 02A | 2750 | PF 1 | 680 | 3664 | 3667.53 | 3667.35 | 3668.52 | 0.011269 | 7.96 | 85.38 | 35.18 | 0.9 |
| 02A | 2500 | PF 1 | 680 | 3659.19 | 3665.46 | 3664.71 | 3666.24 | 0.007194 | 7.08 | 96.02 | 32.36 | 0.72 |
| 02A | 2301.8 | PF 1 | 680 | 3658 | 3663.17 | 3663.17 | 3664.5 | 0.014349 | 9.26 | 73.43 | 27.85 | 1.01 |
| 02A | 2250 | PF 1 | 680 | 3652 | 3655.88 | 3657.78 | 3662.42 | 0.099239 | 20.52 | 33.14 | 15.18 | 2.45 |
| 02A | 2000 | PF 1 | 680 | 3645.26 | 3647.93 | 3648.32 | 3649.35 | 0.028907 | 9.55 | 71.17 | 46.21 | 1.36 |
| 02A | 1750 | PF 1 | 680 | 3641.86 | 3645.36 | 3645.36 | 3646.4 | 0.014662 | 8.18 | 83.17 | 40.67 | 1.01 |
| 02A | 1500 | PF 1 | 680 | 3638.41 | 3640.9 | 3641.06 | 3641.76 | 0.02437 | 7.47 | 91.04 | 75.86 | 1.2 |
| 02A | 1199.521 | PF 1 | 680 | 3634.59 | 3638.1 | 3638.1 | 3638.74 | 0.01498 | 6.4 | 107.2 | 89.39 | 0.96 |
| 02A | 1000 | PF 1 | 680 | 3629.46 | 3633.07 | 3633.61 | 3634.62 | 0.032688 | 10 | 67.98 | 44.66 | 1.43 |
| 02A | 750 | PF 1 | 680 | 3625.83 | 3628.79 | 3628.74 | 3629.57 | 0.013814 | 7.06 | 96.29 | 56.63 | 0.95 |
| 02A | 500 | PF 1 | 680 | 3622.84 | 3626.09 | 3625.9 | 3626.8 | 0.010862 | 6.76 | 100.6 | 52.74 | 0.86 |
| 02A | 250 | PF 1 | 680 | 3619.65 | 3622.85 | 3622.85 | 3623.87 | 0.014156 | 8.14 | 83.59 | 40.16 | 0.99 |
| 02A | 0 | PF 1 | 680 | 3615.82 | 3617.5 | 3617.5 | 3617.51 | 0.000088 | 0.41 | 985.75 | 448.44 | 0.07 |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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 10250.00
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 10000.00
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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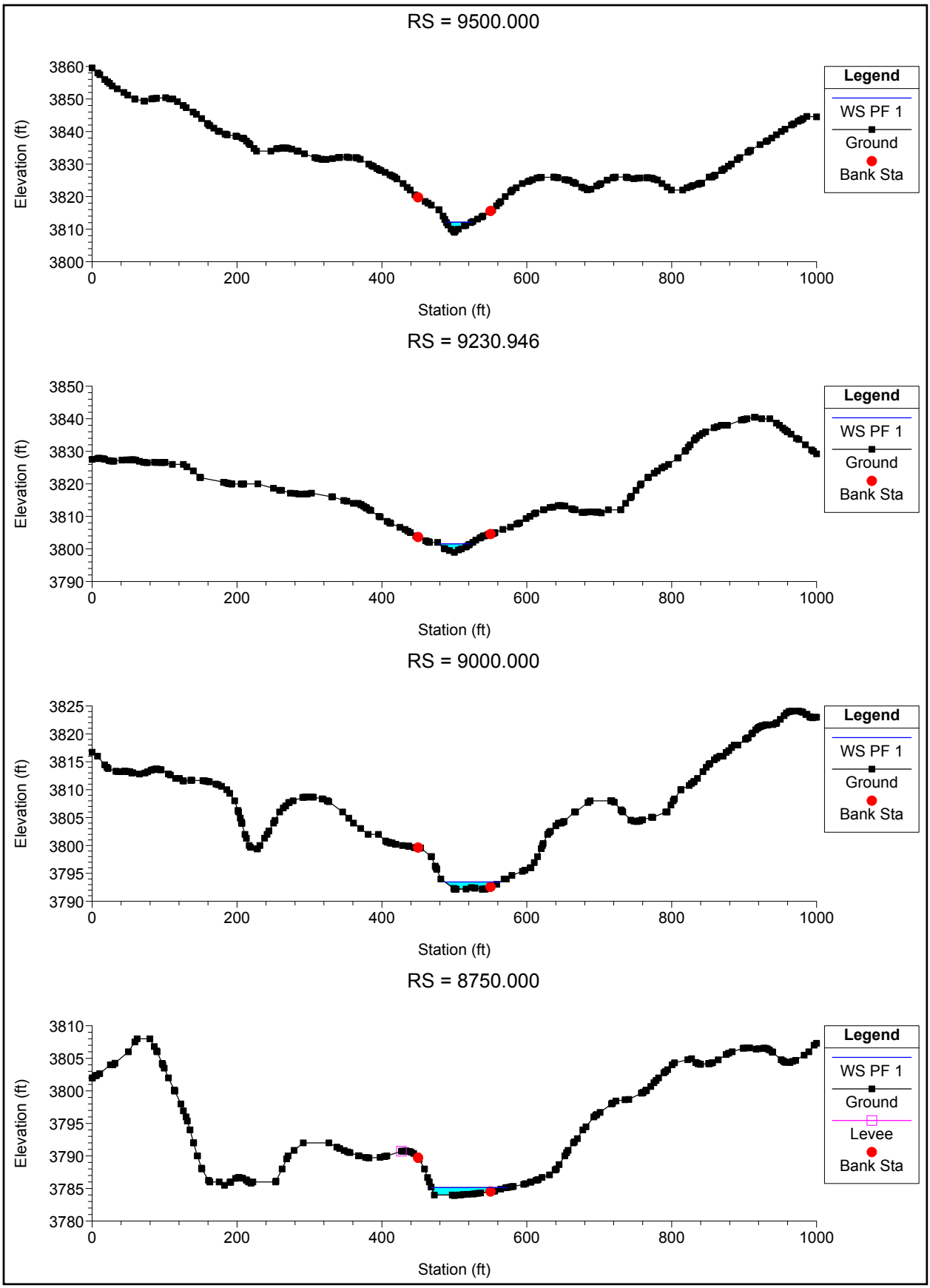
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9230.946
Elevation (ft)
3850
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9000.000
Elevation (ft)
3825
3820
3815
3810
3805
3800
3795
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 8750.000
Elevation (ft)
3810
3805
3800
3795
3790
3785
3780
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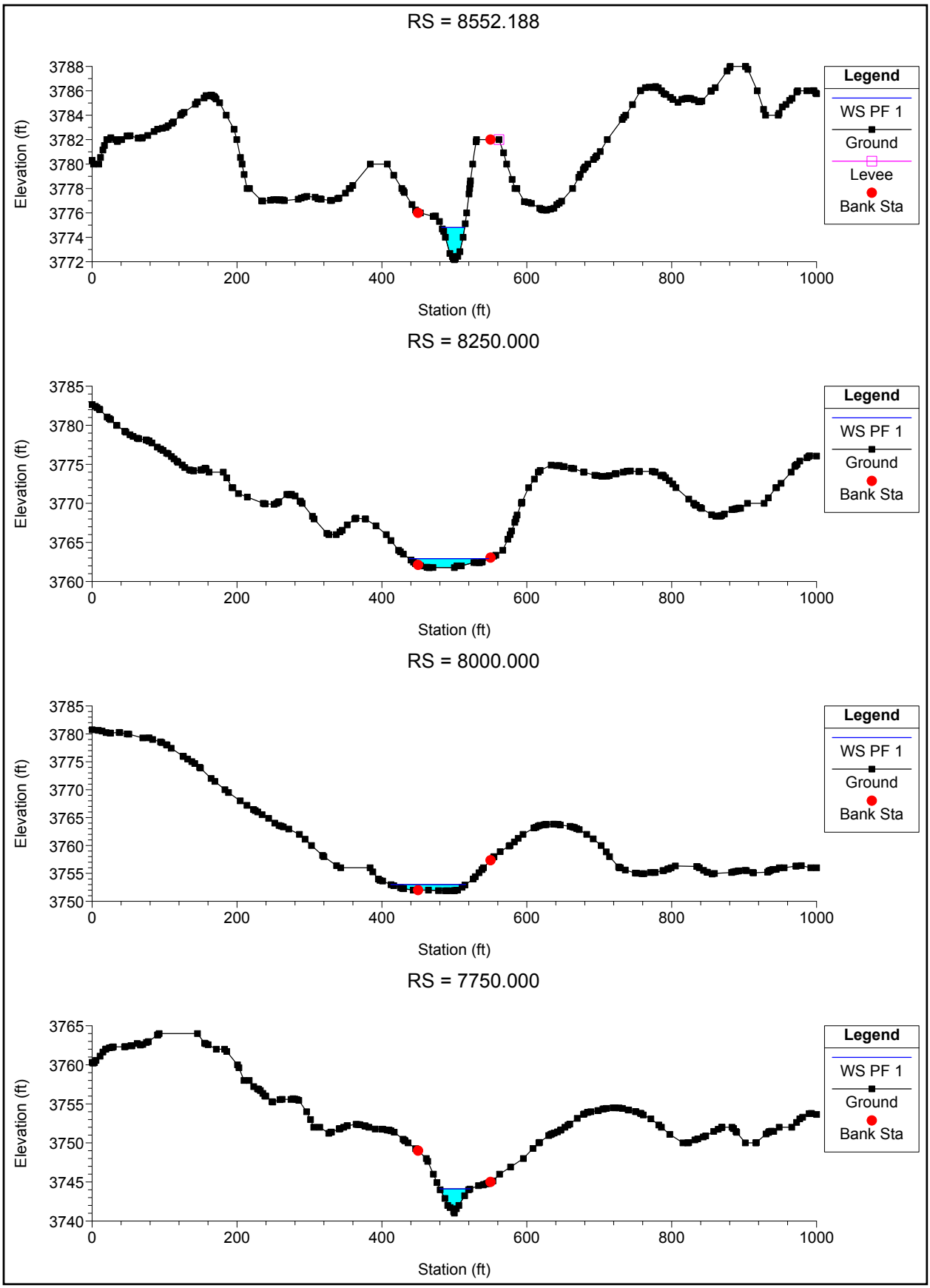
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 8250.000
Elevation (ft)
3785
3780
3775
3770
3765
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 8000.000
Elevation (ft)
3785
3780
3775
3770
3765
3760
3755
3750
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7750.000
Elevation (ft)
3765
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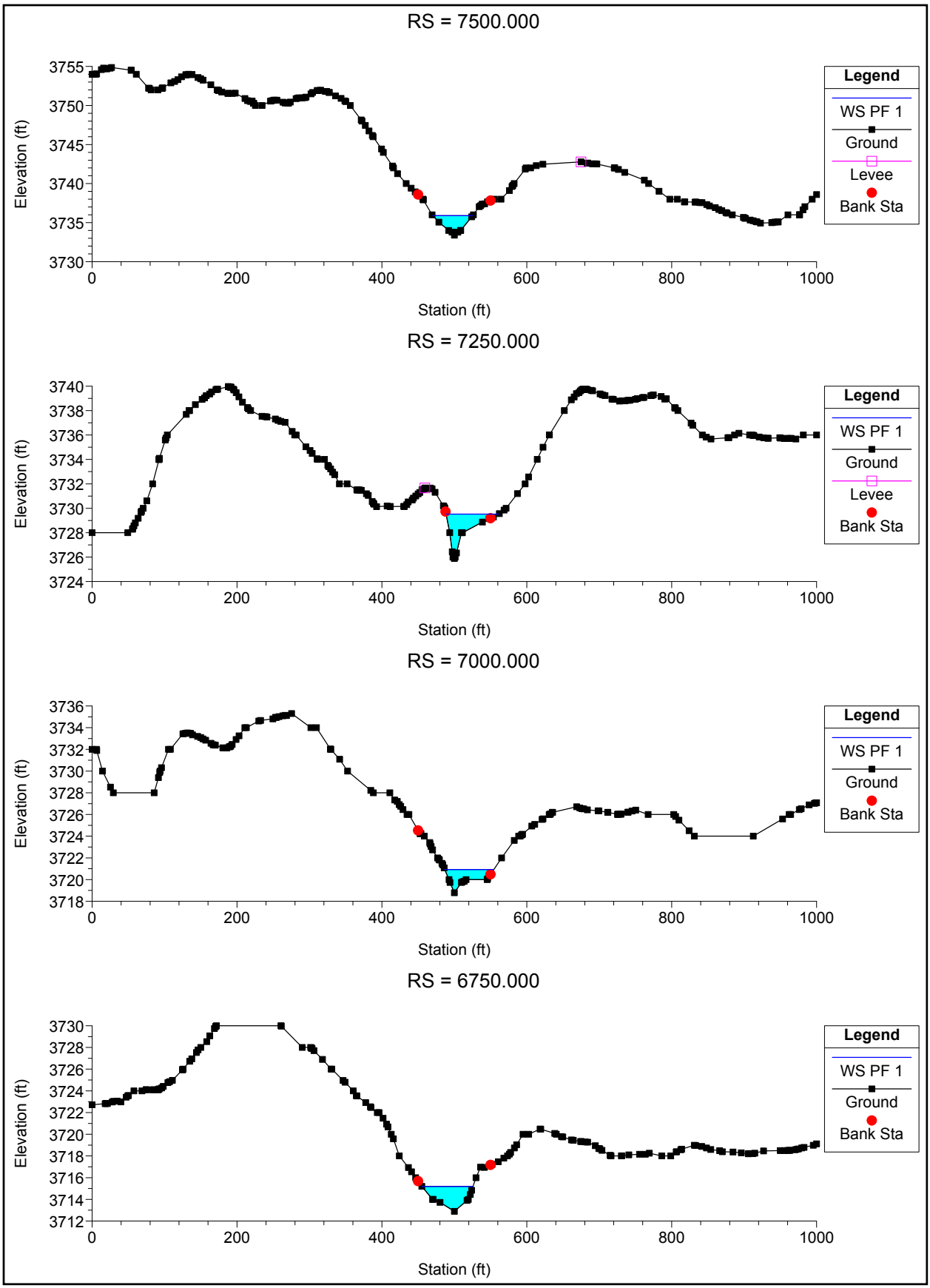
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7250.000
Elevation (ft)
3740
3738
3736
3734
3732
3730
3728
3726
3724
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7000.000
Elevation (ft)
3736
3734
3732
3730
3728
3726
3724
3722
3720
3718
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6750.000
Elevation (ft)
3730
3728
3726
3724
3722
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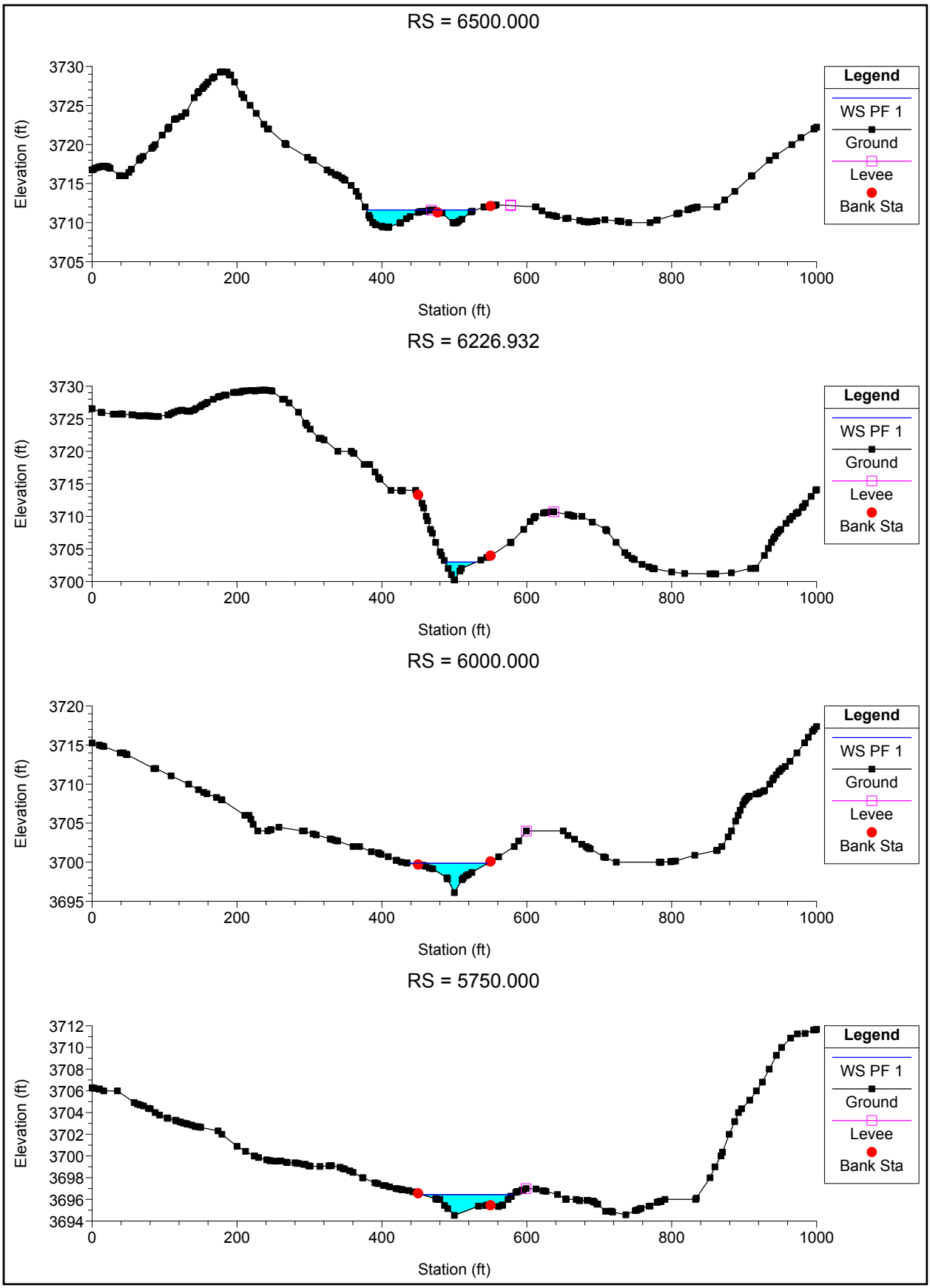
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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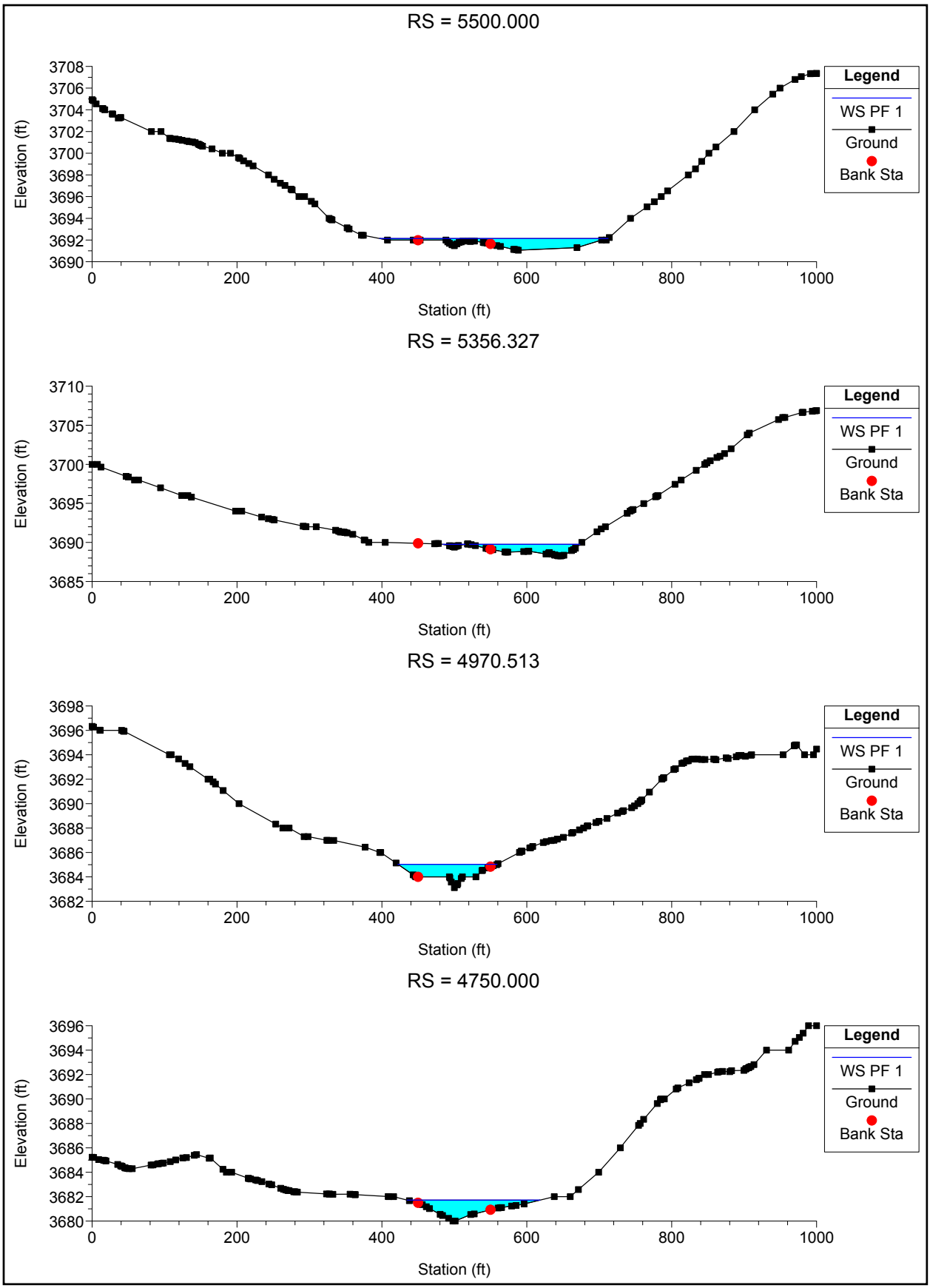
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6226.932
Elevation (ft)
3730
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6000.000
Elevation (ft)
3720
3715
3710
3705
3700
3695
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5750.000
Elevation (ft)
3712
3710
3708
3706
3704
3702
3700
3698
3696
3694
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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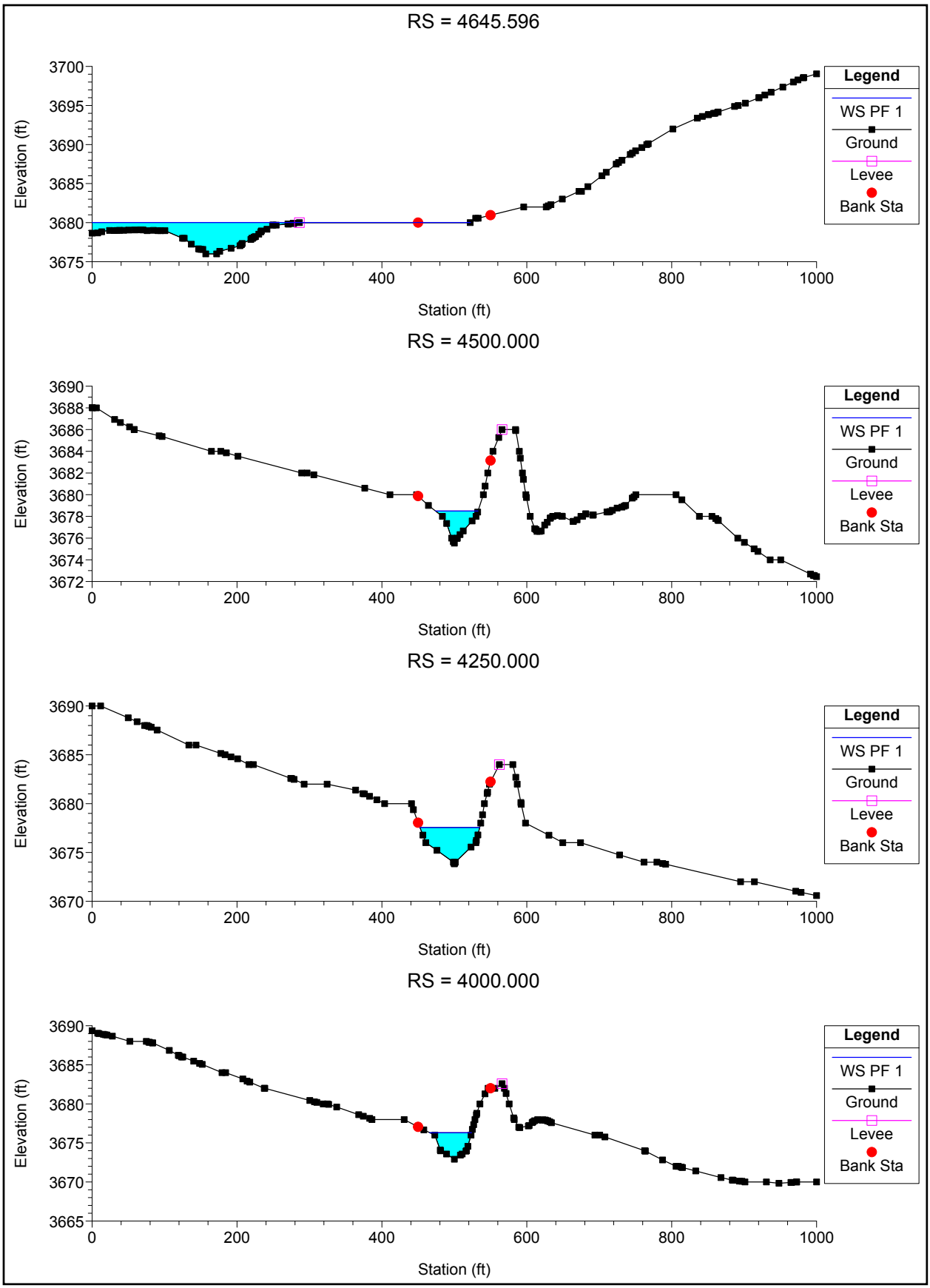
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5356.327
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4970.513
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
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3685
3680
3675
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4500.000
Elevation (ft)
3690
3688
3686
3684
3682
3680
3678
3676
3674
3672
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4250.000
Elevation (ft)
3690
3685
3680
3675
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4000.000
Elevation (ft)
3690
3685
3680
3675
3670
3665
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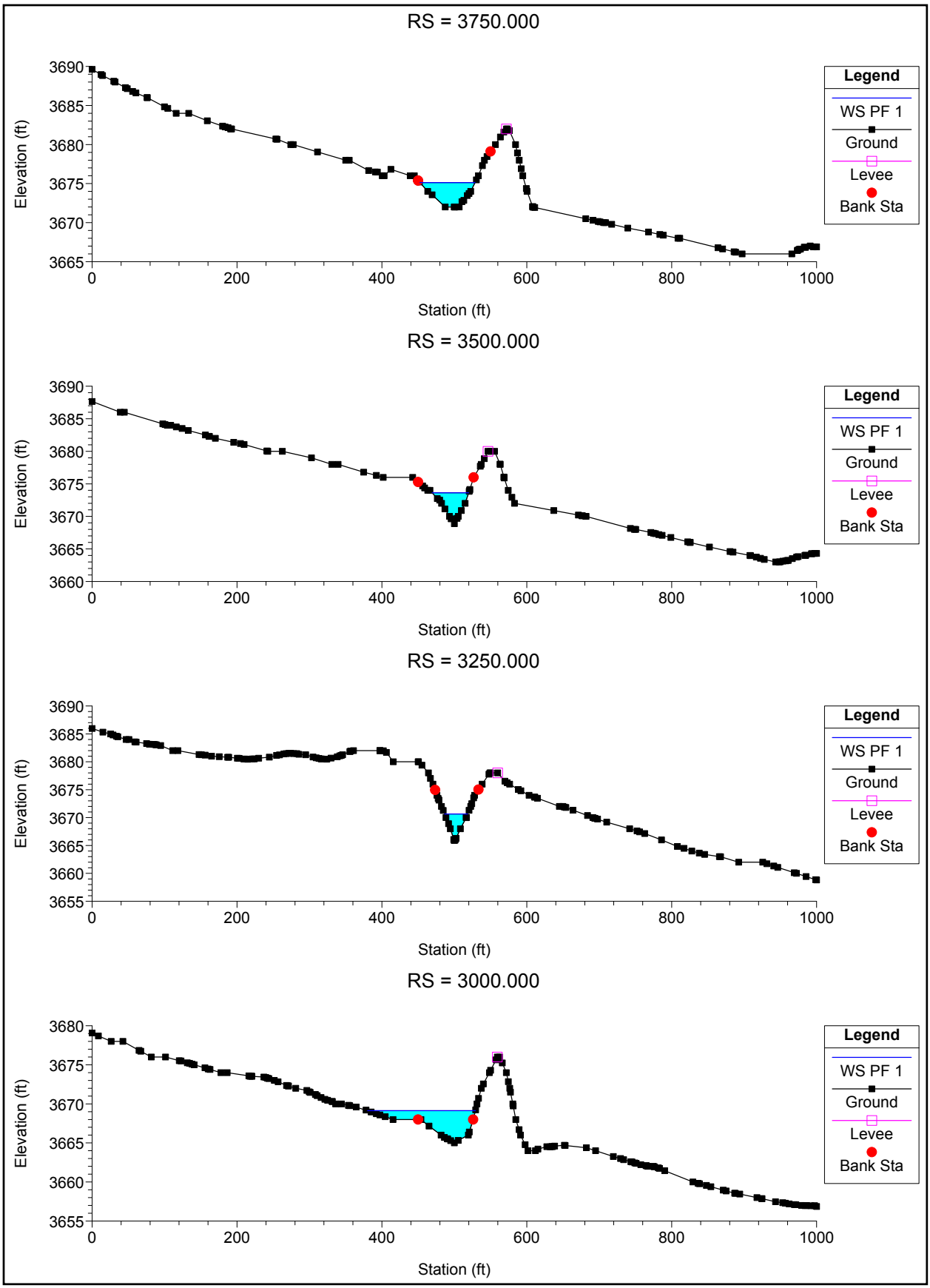
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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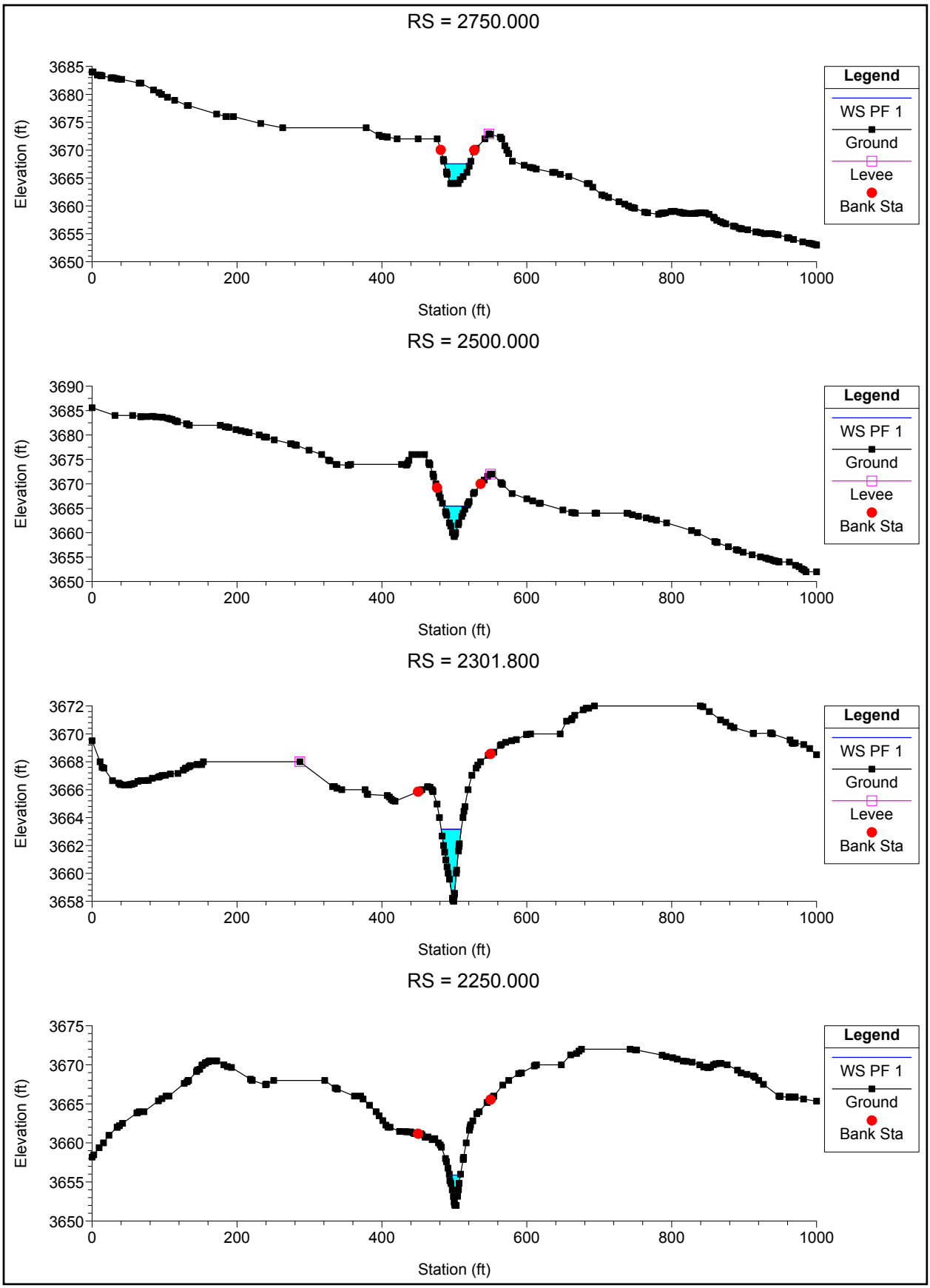
3680
3675
3670
3665
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3500.000
Elevation (ft)
3690
3685
3680
3675
3670
3665
3660
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3250.000
Elevation (ft)
3690
3685
3680
3675
3670
3665
3660
3655
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3000.000
Elevation (ft)
3680
3675
3670
3665
3660
3655
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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3675
3670
3665
3660
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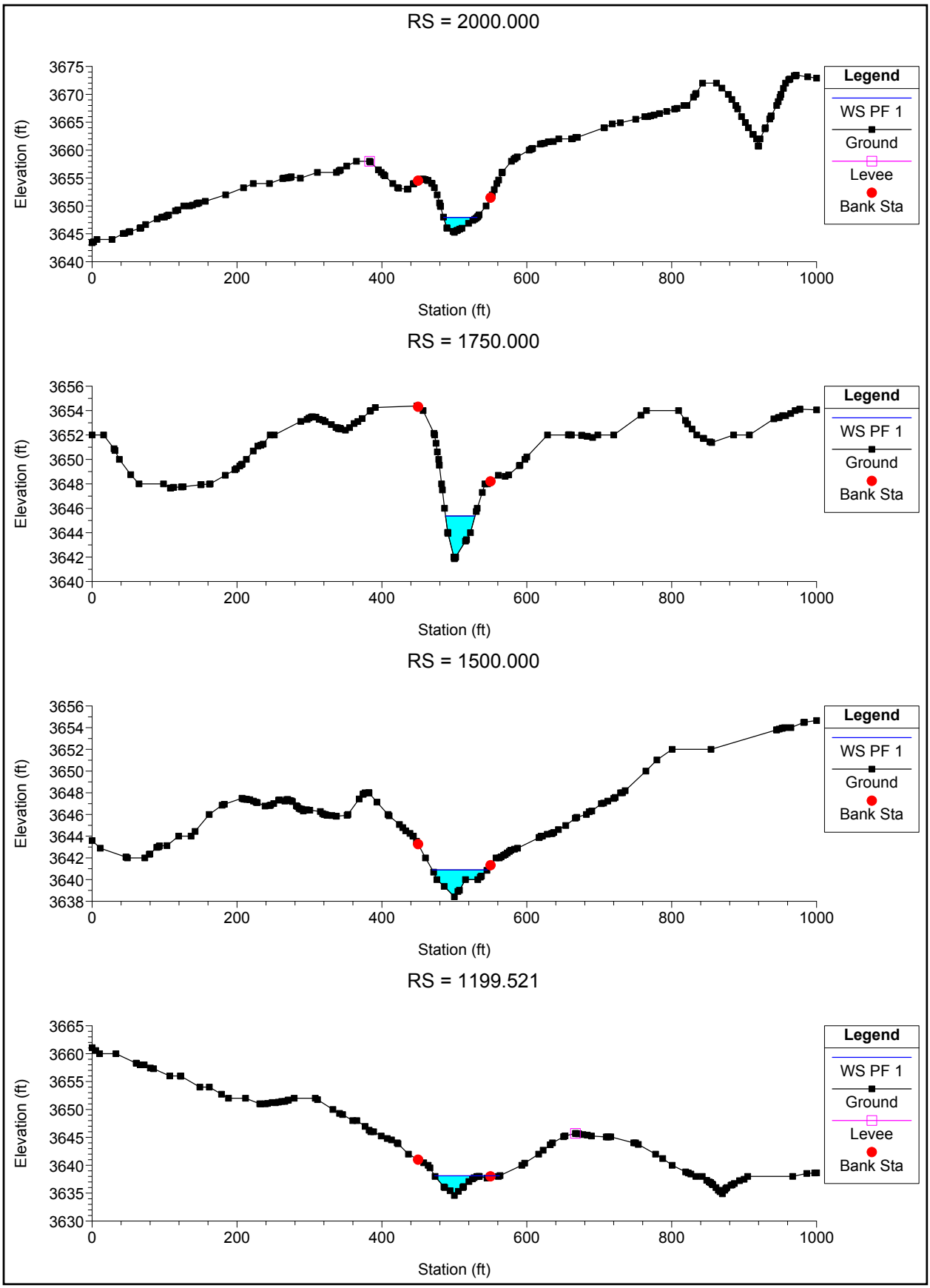
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2500.000
Elevation (ft)
3690
3685
3680
3675
3670
3665
3660
3655
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2301.800
Elevation (ft)
3672
3670
3668
3666
3664
3662
3660
3658
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2250.000
Elevation (ft)
3675
3670
3665
3660
3655
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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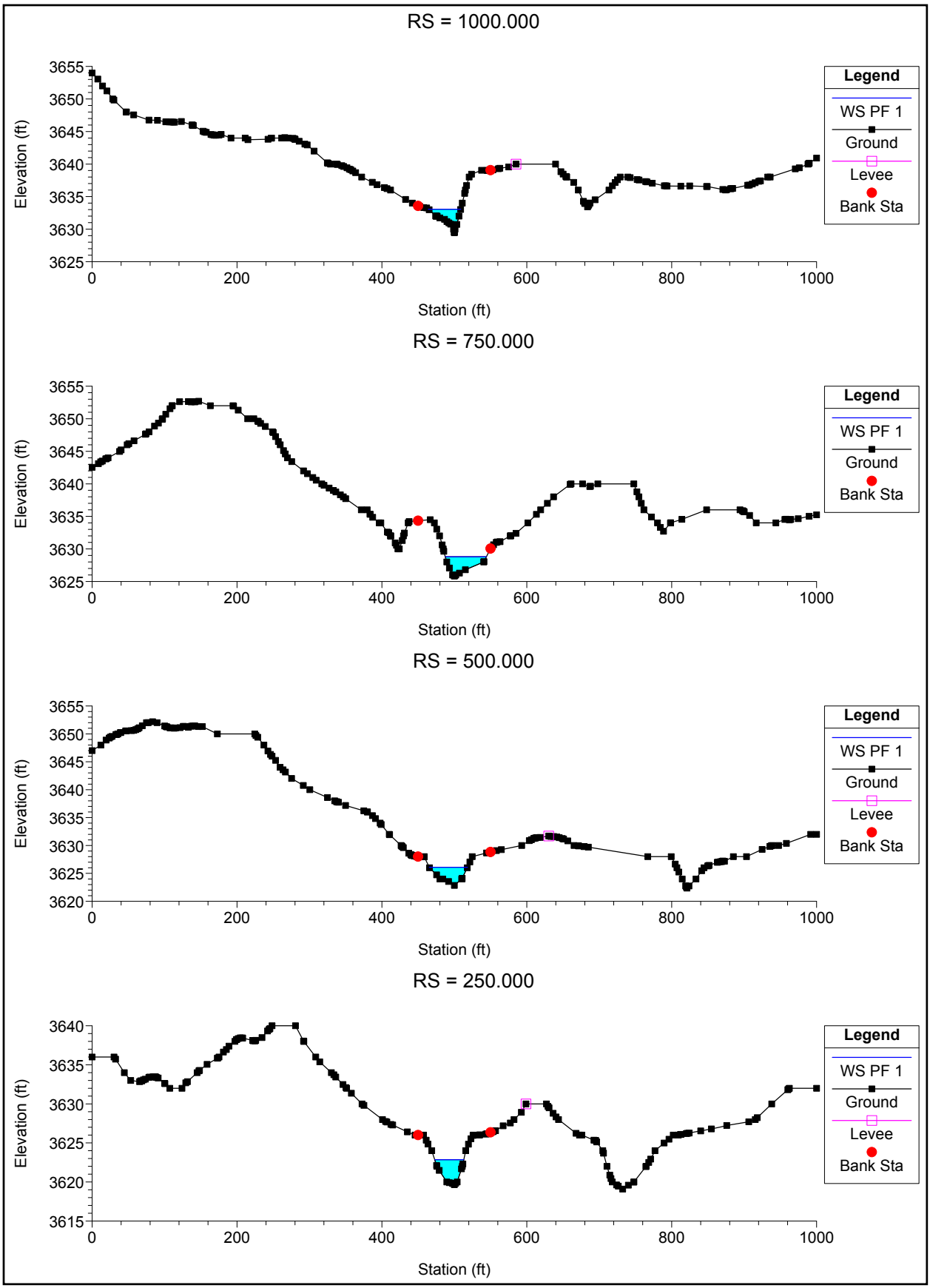
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1199.521
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 1000.000
Elevation (ft)
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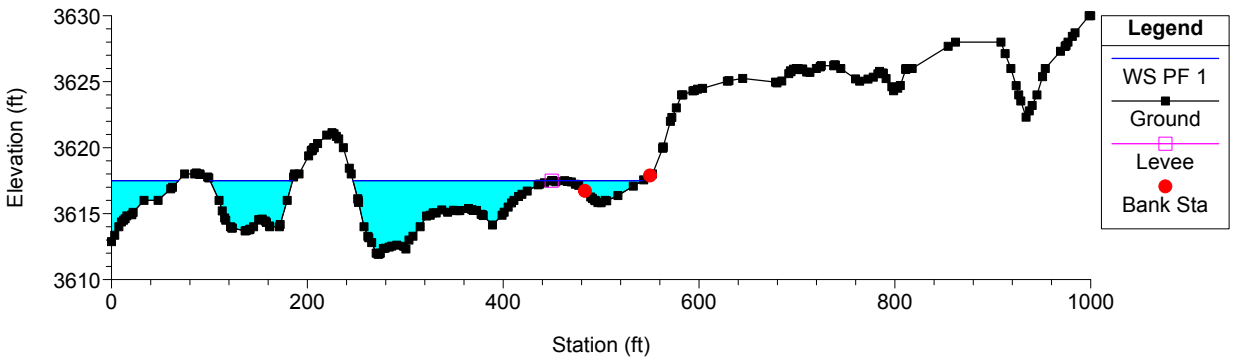
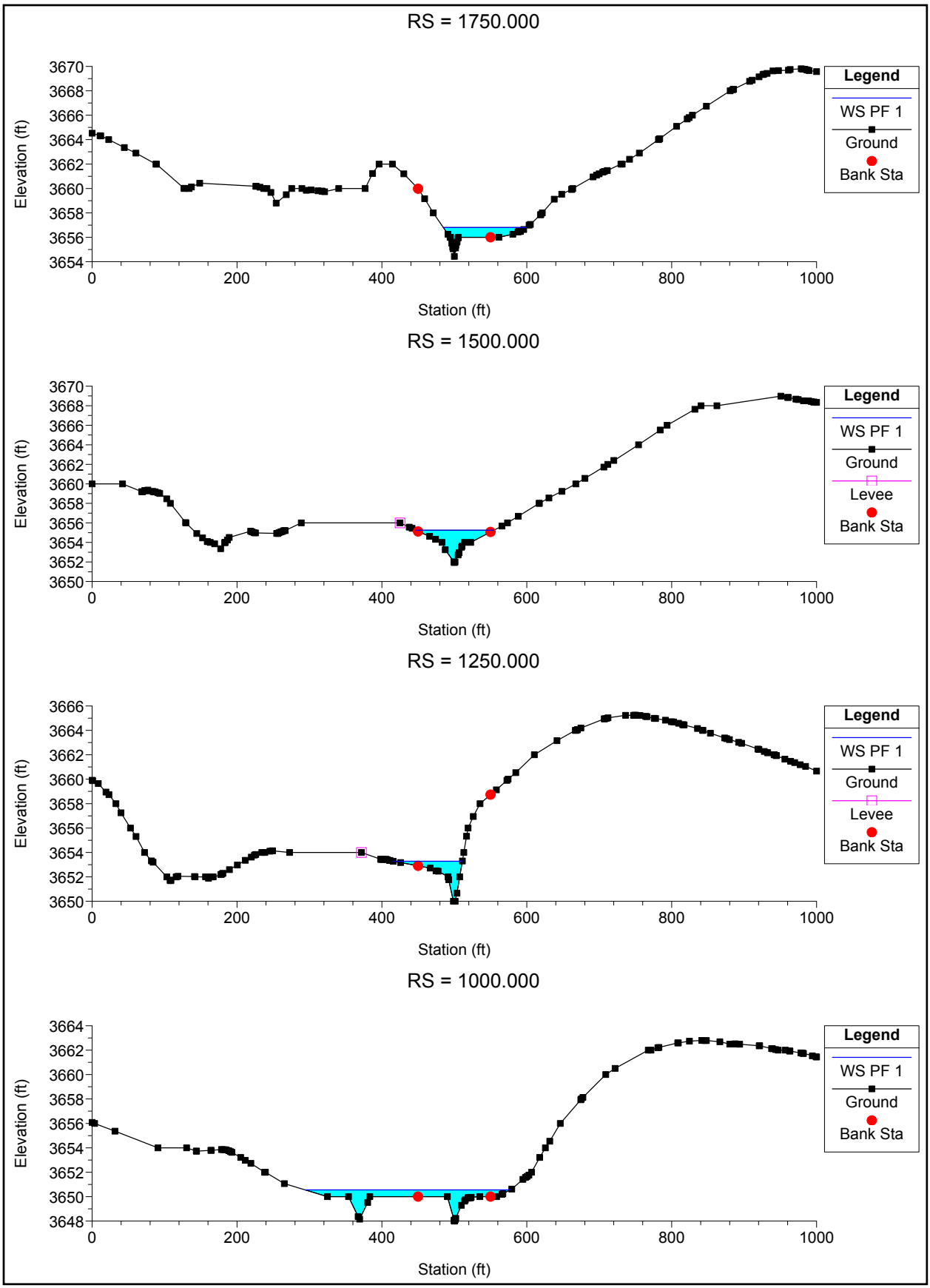
3650
3645
3640
3635
3630
3625
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3655
3650
3645
3640
3635
3630
3625
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3655
3650
3645
3640
3635
3630
3625
3620
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3640
3635
3630
3625
3620
3615
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 0.000
Elevation (ft)
3630
3625
3620
3615
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-5

# HEC-RAS Channel 02B

| 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) | |
| 02B | 1750 | PF 1 | 406 | 3654.44 | 3656.8 | 3656.81 | 3657.18 | 0.018994 | 5.25 | 83.83 | 114.22 | 1 |
| 02B | 1500 | PF 1 | 406 | 3651.94 | 3655.25 | 3654.7 | 3655.41 | 0.004433 | 3.26 | 124.99 | 107.88 | 0.52 |
| 02B | 1250 | PF 1 | 406 | 3650 | 3653.28 | 3653.28 | 3653.74 | 0.013808 | 5.51 | 78.26 | 95.8 | 0.9 |
| 02B | 1000 | PF 1 | 406 | 3648 | 3650.55 | 3650.21 | 3650.62 | 0.003642 | 2.24 | 197.75 | 282.85 | 0.44 |
| 02B | 750 | PF 1 | 406 | 3645.12 | 3648.59 | 3648.59 | 3649.11 | 0.016605 | 5.82 | 71.77 | 78.2 | 0.97 |
| 02B | 554.595 | PF 1 | 406 | 3642.67 | 3644.94 | 3645 | 3645.42 | 0.025804 | 5.58 | 72.51 | 97.04 | 1.14 |
| 02B | 263.213 | PF 1 | 406 | 3640.04 | 3641.93 | 3641.69 | 3642.32 | 0.009713 | 5.06 | 80.26 | 60.14 | 0.77 |
| 02B | 0 | PF 1 | 406 | 3637.84 | 3639.83 | 3639.59 | 3640.18 | 0.009007 | 4.79 | 86.61 | 79.54 | 0.74 |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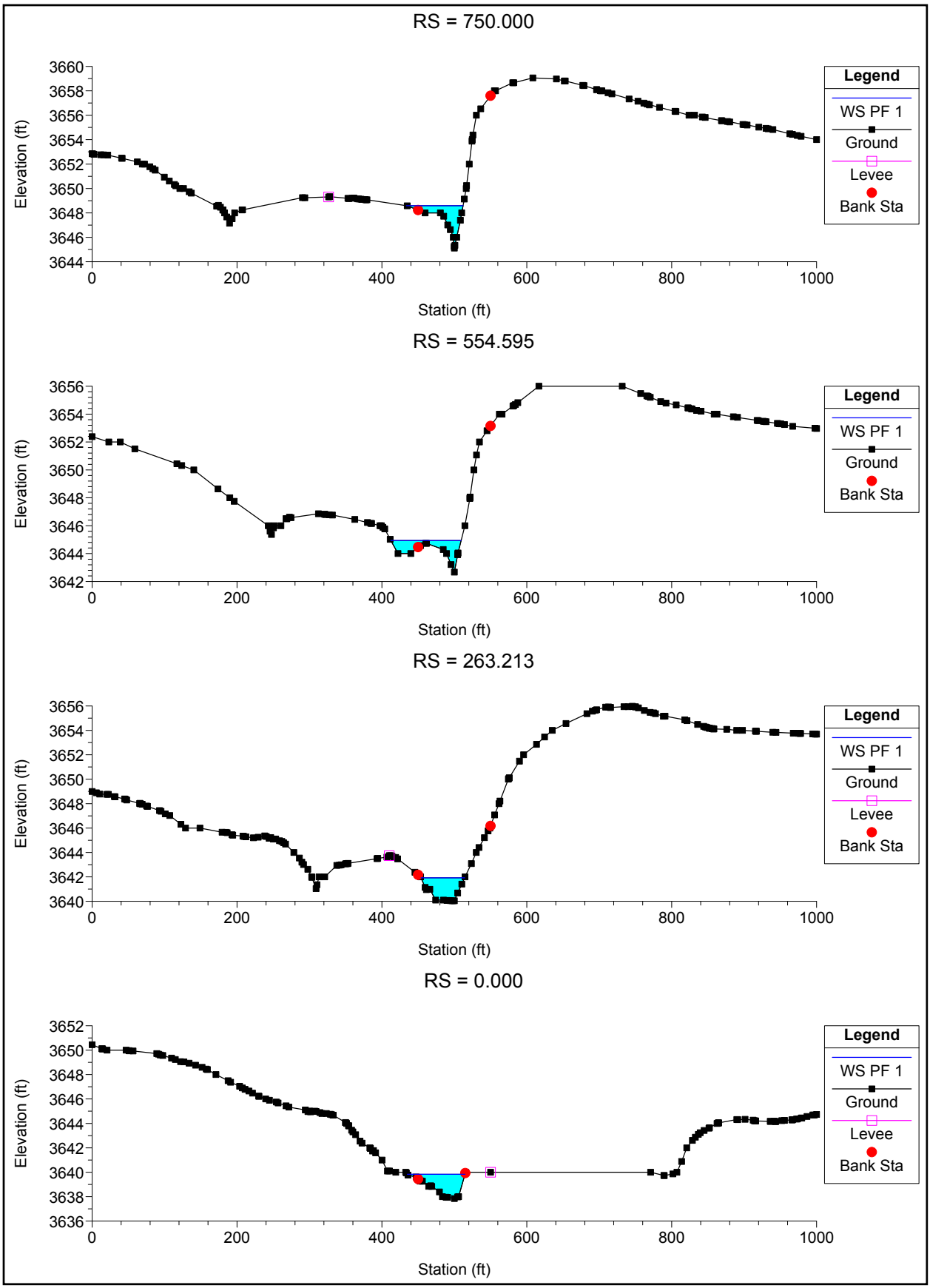
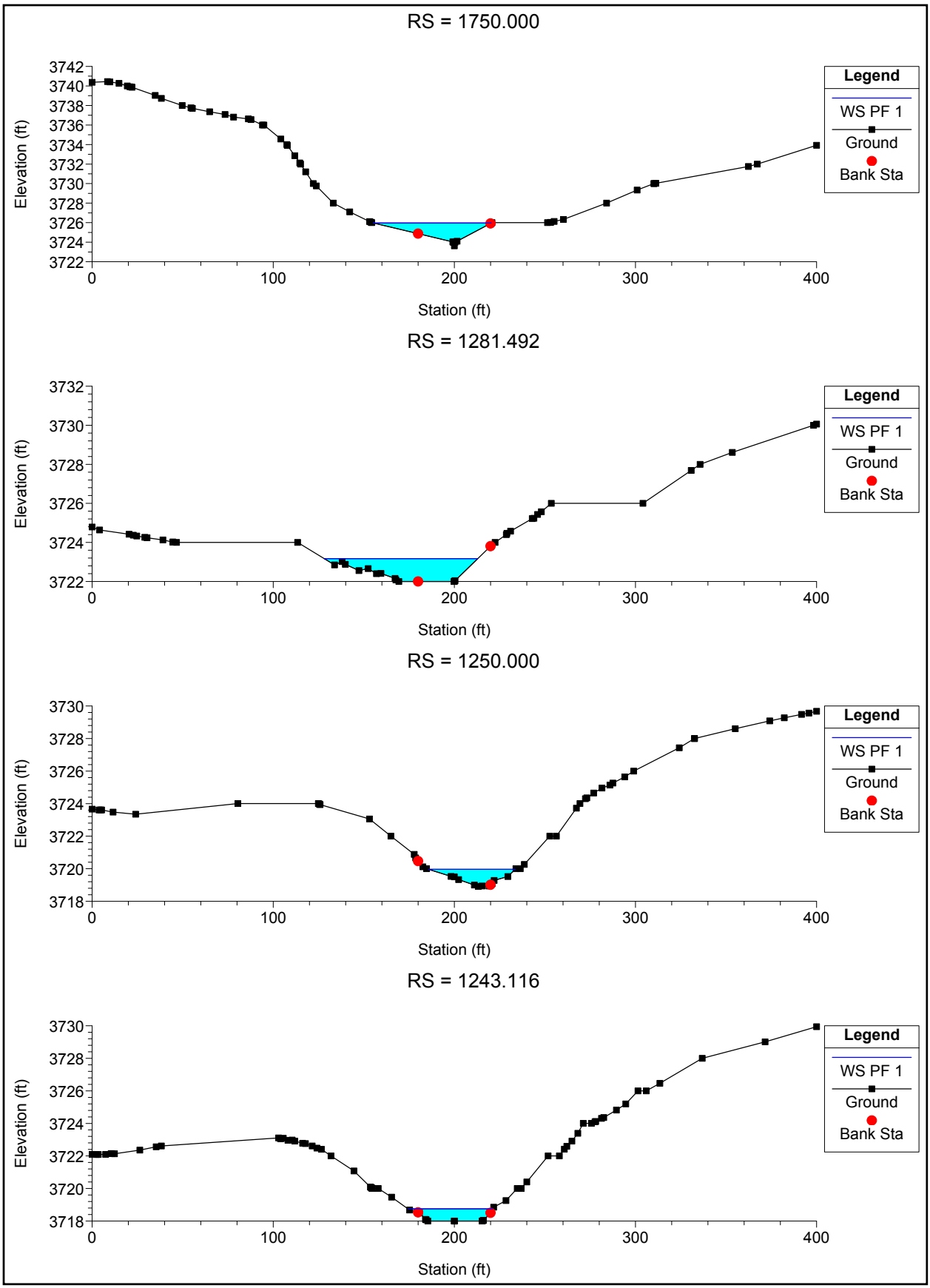
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 554.595
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 263.213
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-6

# HEC-RAS Channel 03

| 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) | |
| 3 | 1750 | PF 1 | 324 | 3723.62 | 3725.96 | 3725.89 | 3726.39 | 0.012086 | 5.48 | 64.96 | 65.19 | 0.85 |
| 3 | 1281.492 | PF 1 | 324 | 3722 | 3723.17 | 3723.17 | 3723.56 | 0.018033 | 5.47 | 66.14 | 84.82 | 0.99 |
| 3 | 1250 | PF 1 | 324 | 3718.91 | 3719.96 | 3720.5 | 3722.11 | 0.156986 | 12.07 | 27.69 | 47.94 | 2.73 |
| 3 | 1243.116 | PF 1 | 341 | 3718 | 3718.75 | 3719.37 | 3721.08 | 0.138808 | 12.3 | 28.32 | 46.8 | 2.62 |
| 3 | 1000 | PF 1 | 341 | 3713.41 | 3715.75 | 3715.58 | 3716.2 | 0.00974 | 5.49 | 65.42 | 56.16 | 0.79 |
| 3 | 750 | PF 1 | 341 | 3710.82 | 3712.9 | 3712.9 | 3713.52 | 0.015204 | 6.41 | 55.19 | 46.68 | 0.97 |
| 3 | 500 | PF 1 | 341 | 3709.36 | 3711.37 | 3710.79 | 3711.55 | 0.003729 | 3.7 | 102.51 | 76.48 | 0.5 |
| 3 | 250 | PF 1 | 341 | 3708.09 | 3709.75 | 3709.75 | 3710.15 | 0.011915 | 5.45 | 75.65 | 100.47 | 0.85 |
| 3 | 169.672 | PF 1 | 341 | 3706.19 | 3709.07 | 3709.07 | 3709.09 | 0.00036 | 0.79 | 335.41 | 253.36 | 0.14 |
| 3 | 0 | PF 1 | 341 | 3698.1 | 3700.47 | 3702.03 | 3708.12 | 0.241067 | 22.2 | 15.36 | 13.16 | 3.62 |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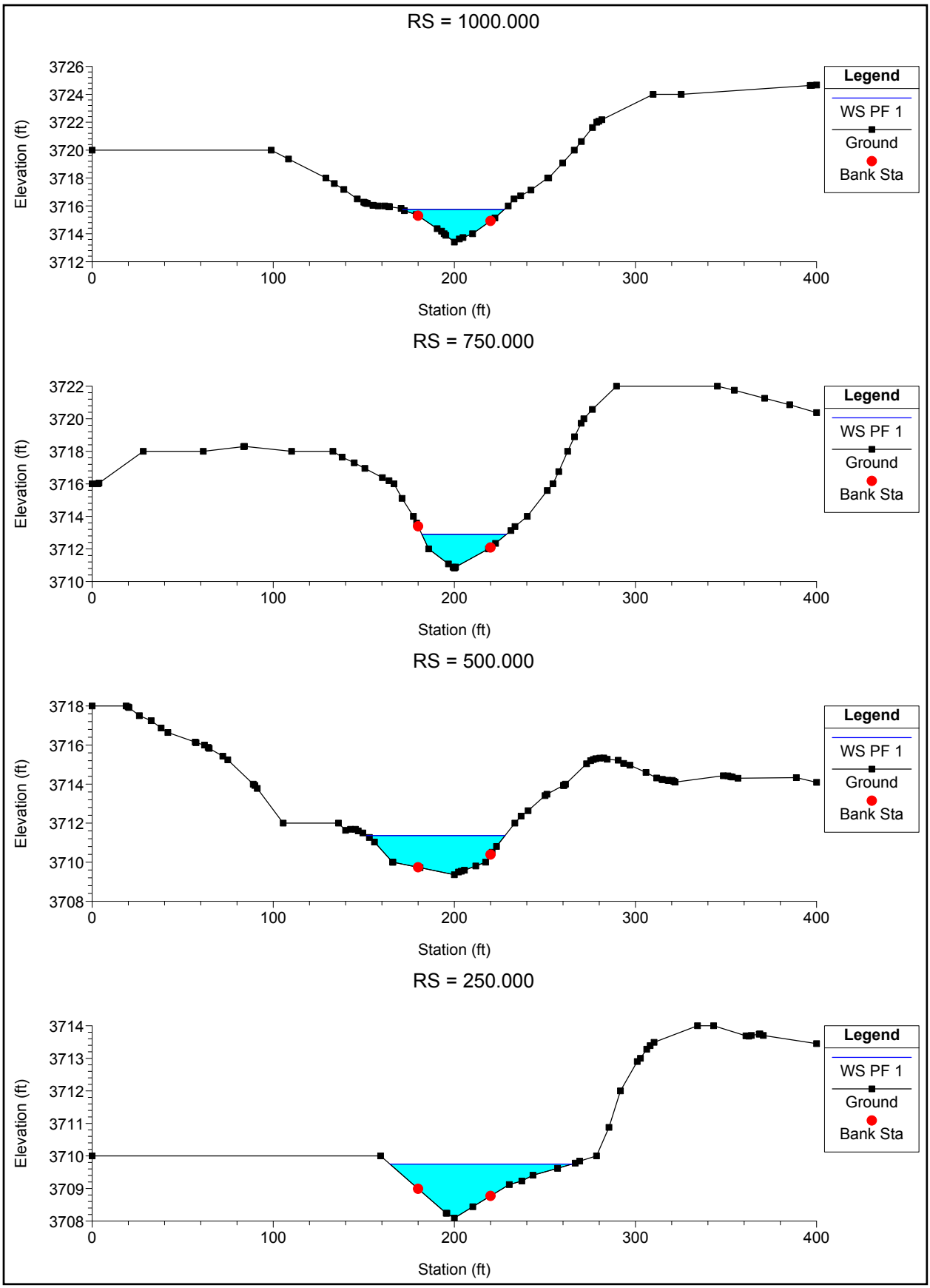
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1281.492
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1243.116
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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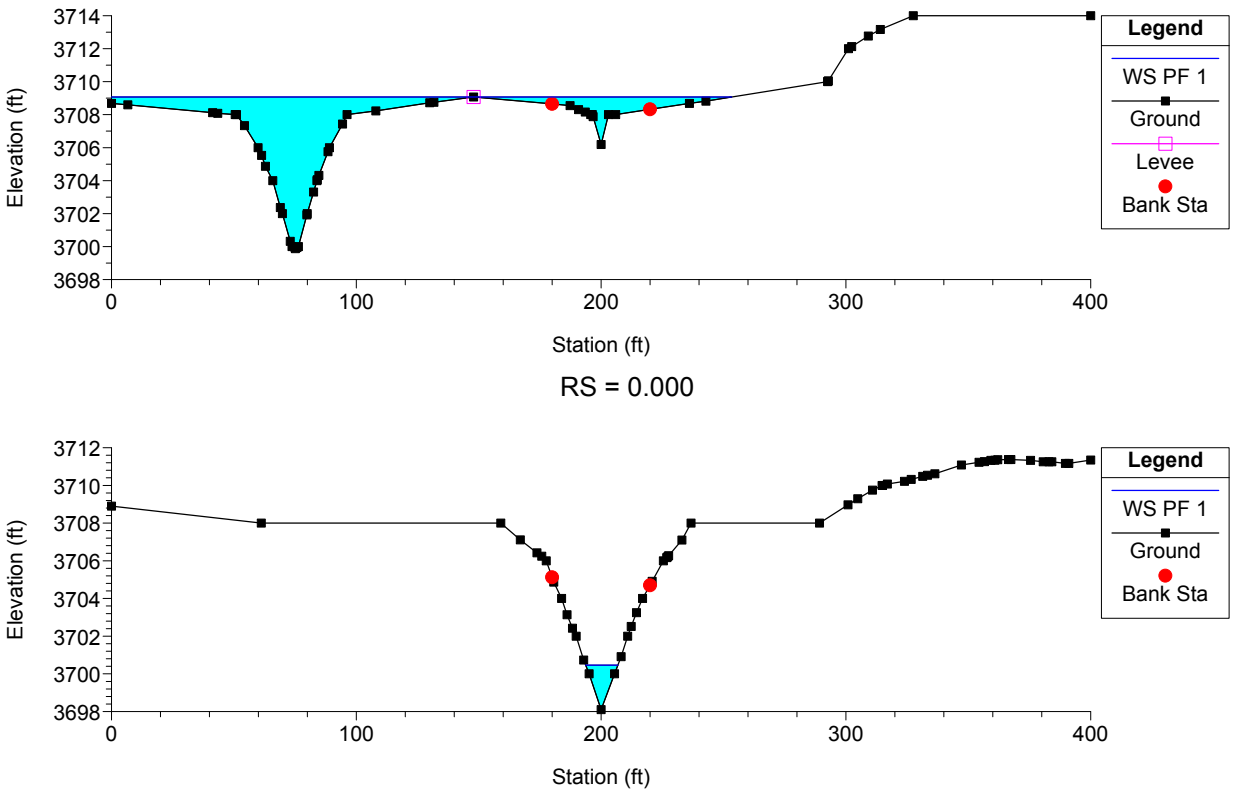
3720
3718
3716
3714
3712
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
3722
3720
3718
3716
3714
3712
3710
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3718
3716
3714
3712
3710
3708
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3714
3713
3712
3711
3710
3709
3708
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 169.672
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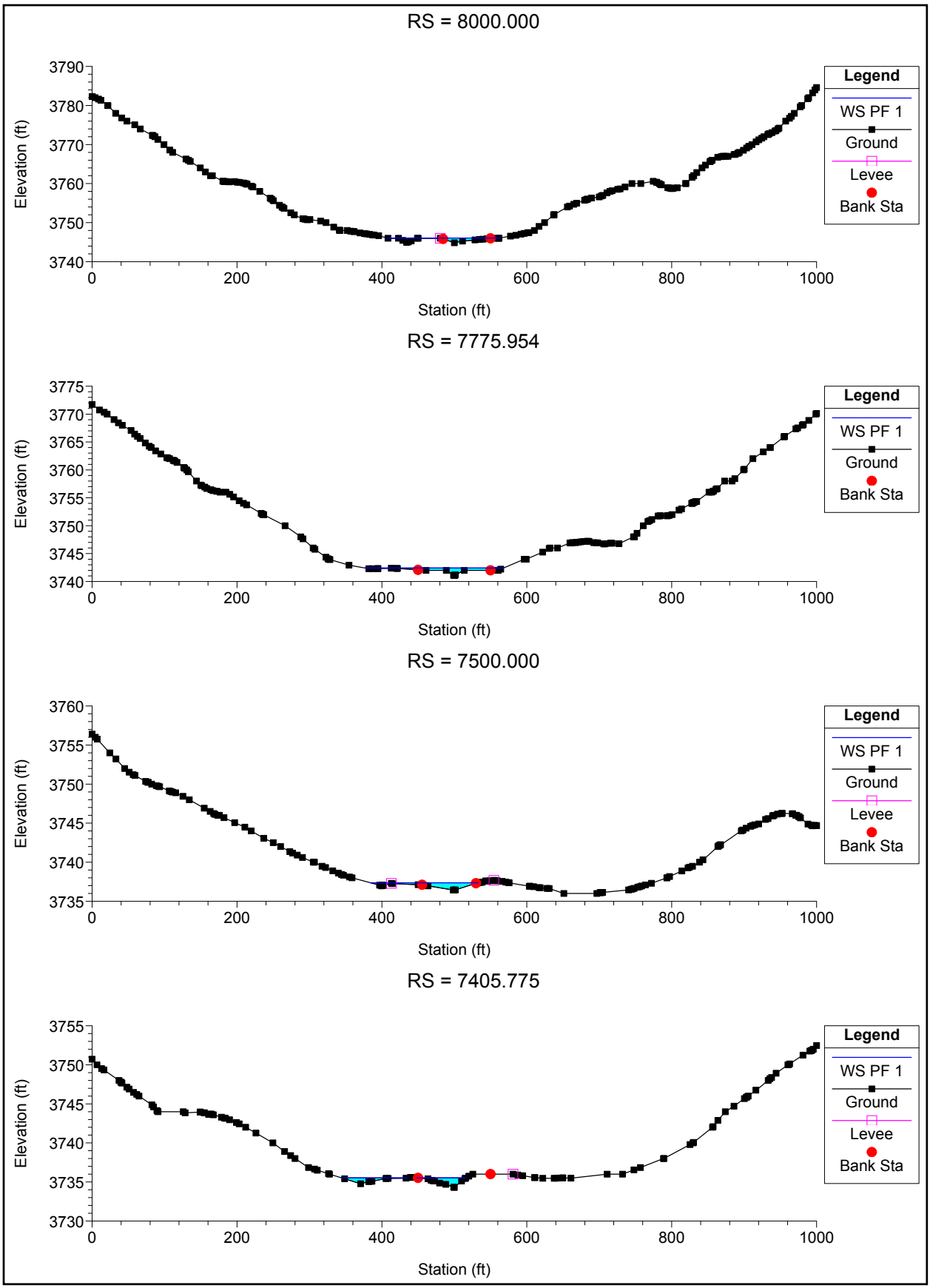
3712
3710
3708
3706
3704
3702
3700
3698
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 0.000
Elevation (ft)
3712
3710
3708
3706
3704
3702
3700
3698
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-7

# HEC-RAS Channel 04

| 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) | |
| 4 | 8000 | PF 1 | 211 | 3744.86 | 3746.08 | 3746.1 | 3746.29 | 0.01702 | 4.02 | 62.18 | 156.24 | 0.9 |
| 4 | 7775.954 | PF 1 | 211 | 3741.07 | 3742.41 | 3742.42 | 3742.59 | 0.016193 | 3.5 | 67.51 | 191.25 | 0.85 |
| 4 | 7500 | PF 1 | 211 | 3736.44 | 3737.36 | 3737.41 | 3737.63 | 0.022327 | 4.34 | 55.72 | 148.67 | 1.02 |
| 4 | 7405.775 | PF 1 | 211 | 3734.31 | 3735.54 | 3735.54 | 3735.74 | 0.020686 | 4.02 | 61.49 | 160.43 | 0.97 |
| 4 | 7250 | PF 1 | 211 | 3732.14 | 3733.05 | 3733.05 | 3733.1 | 0.003412 | 2.08 | 121.05 | 213.18 | 0.42 |
| 4 | 7000 | PF 1 | 211 | 3727.49 | 3727.82 | 3727.82 | 3727.83 | 0.000584 | 0.31 | 228.31 | 282.76 | 0.13 |
| 4 | 6750 | PF 1 | 211 | 3722.66 | 3723.2 | 3723.44 | 3726.94 | 0.768553 | 15.52 | 13.6 | 50.9 | 5.27 |
| 4 | 6486.006 | PF 1 | 211 | 3717.49 | 3718.76 | 3718.59 | 3718.85 | 0.005511 | 2.69 | 93.95 | 171.59 | 0.53 |
| 4 | 6250 | PF 1 | 211 | 3714.22 | 3716 | 3715.9 | 3716.34 | 0.03427 | 4.66 | 45.35 | 110.65 | 1.21 |
| 4 | 6038.126 | PF 1 | 211 | 3709.03 | 3711.28 | 3711.28 | 3711.79 | 0.017368 | 5.71 | 36.96 | 35.58 | 0.99 |
| 4 | 5763.753 | PF 1 | 211 | 3704.65 | 3706.31 | 3706.41 | 3706.79 | 0.022271 | 5.6 | 38.93 | 56.56 | 1.08 |
| 4 | 5542.373 | PF 1 | 211 | 3701.02 | 3702.11 | 3702.11 | 3702.11 | 0.000068 | 0.12 | 499.06 | 423.31 | 0.05 |
| 4 | 5250 | PF 1 | 211 | 3697.89 | 3697.36 | 3698.1 | 3701.62 | 0.586289 | | 12.74 | 35.03 | 0 |
| 4 | 5000 | PF 1 | 211 | 3693.45 | 3694.8 | 3694.8 | 3695.08 | 0.019751 | 4.25 | 50.66 | 96.71 | 0.97 |
| 4 | 4790.533 | PF 1 | 211 | 3691.2 | 3692.13 | 3692.07 | 3692.19 | 0.008847 | 2.19 | 120.75 | 454.09 | 0.61 |
| 4 | 4509.617 | PF 1 | 211 | 3687.67 | 3688.56 | 3688.56 | 3688.77 | 0.019398 | 3.77 | 60.19 | 150.88 | 0.93 |
| 4 | 4250 | PF 1 | 211 | 3685.51 | 3686.01 | 3686.01 | 3686.01 | 0.000385 | 0.27 | 332.51 | 544.6 | 0.11 |
| 4 | 4000 | PF 1 | 211 | 3683.52 | 3683.99 | 3684.13 | 3685.51 | 0.577836 | 11.4 | 24.4 | 214.12 | 4.38 |
| 4 | 3750 | PF 1 | 211 | 3681.42 | 3682.01 | 3682.01 | 3682.02 | 0.001994 | 1.12 | 218.81 | 672.17 | 0.29 |
| 4 | 3500 | PF 1 | 211 | 3679.21 | 3679.65 | 3679.85 | 3680.4 | 0.155772 | 7.26 | 31.62 | 137.3 | 2.4 |
| 4 | 3238.929 | PF 1 | 211 | 3677.14 | 3678.01 | 3677.82 | 3678.01 | 0.000215 | 0.48 | 433.09 | 824.19 | 0.1 |
| 4 | 3000 | PF 1 | 211 | 3675.59 | 3675.96 | 3675.96 | 3676.09 | 0.028645 | 3.01 | 75.11 | 308.17 | 1.02 |
| 4 | 2750 | PF 1 | 211 | 3673.56 | 3674.01 | 3674.01 | 3674.01 | 0.000052 | 0.08 | 608.92 | 619.86 | 0.04 |
| 4 | 2500 | PF 1 | 211 | 3671.48 | 3672.01 | 3672.01 | 3672.01 | 0.000039 | 0.1 | 660.67 | 523.57 | 0.04 |
| 4 | 2250 | PF 1 | 211 | 3669.41 | 3670.01 | 3670.01 | 3670.01 | 0.000235 | 0.27 | 394.41 | 565.51 | 0.09 |
| 4 | 2000 | PF 1 | 211 | 3667.38 | 3667.93 | 3668.13 | 3669.64 | 0.399467 | 10.5 | 20.09 | 82.06 | 3.74 |
| 4 | 1750 | PF 1 | 211 | 3665.64 | 3665.74 | 3665.74 | 3666.02 | 0.022525 | 0.83 | 48.97 | 89.32 | 0.67 |
| 4 | 1500 | PF 1 | 211 | 3664 | 3664.58 | 3664.21 | 3664.58 | 0.000376 | 0.56 | 386.92 | 725.64 | 0.13 |
| 4 | 1250 | PF 1 | 211 | 3662 | 3663.83 | 3663.83 | 3664.27 | 0.016547 | 5.34 | 40.64 | 49.11 | 0.96 |
| 4 | 1000 | PF 1 | 211 | 3661.53 | 3662.01 | 3662.01 | 3662.02 | 0.000627 | 0.41 | 212.26 | 255.8 | 0.15 |
| 4 | 750 | PF 1 | 211 | 3660 | 3660.36 | 3660.64 | 3661.4 | 0.18586 | 7.86 | 25.87 | 87.3 | 2.61 |
| 4 | 500 | PF 1 | 211 | 3659.35 | 3660.01 | 3660.01 | 3660.01 | 0.000074 | 0.22 | 553.4 | 994.9 | 0.06 |
| 4 | 250 | PF 1 | 211 | 3657.83 | 3658.01 | 3658.01 | 3658.02 | 0.001728 | 0.09 | 206.34 | 721.24 | 0.15 |
| 4 | 0 | PF 1 | 211 | 3648.81 | 3649.65 | 3650.46 | 3656.27 | 0.772095 | 20.89 | 10.31 | 25.78 | 5.67 |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3780
3770
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3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7775.954
Elevation (ft)
3775
3770
3765
3760
3755
3750
3745
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7500.000
Elevation (ft)
3760
3755
3750
3745
3740
3735
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7405.775
Elevation (ft)
3755
3750
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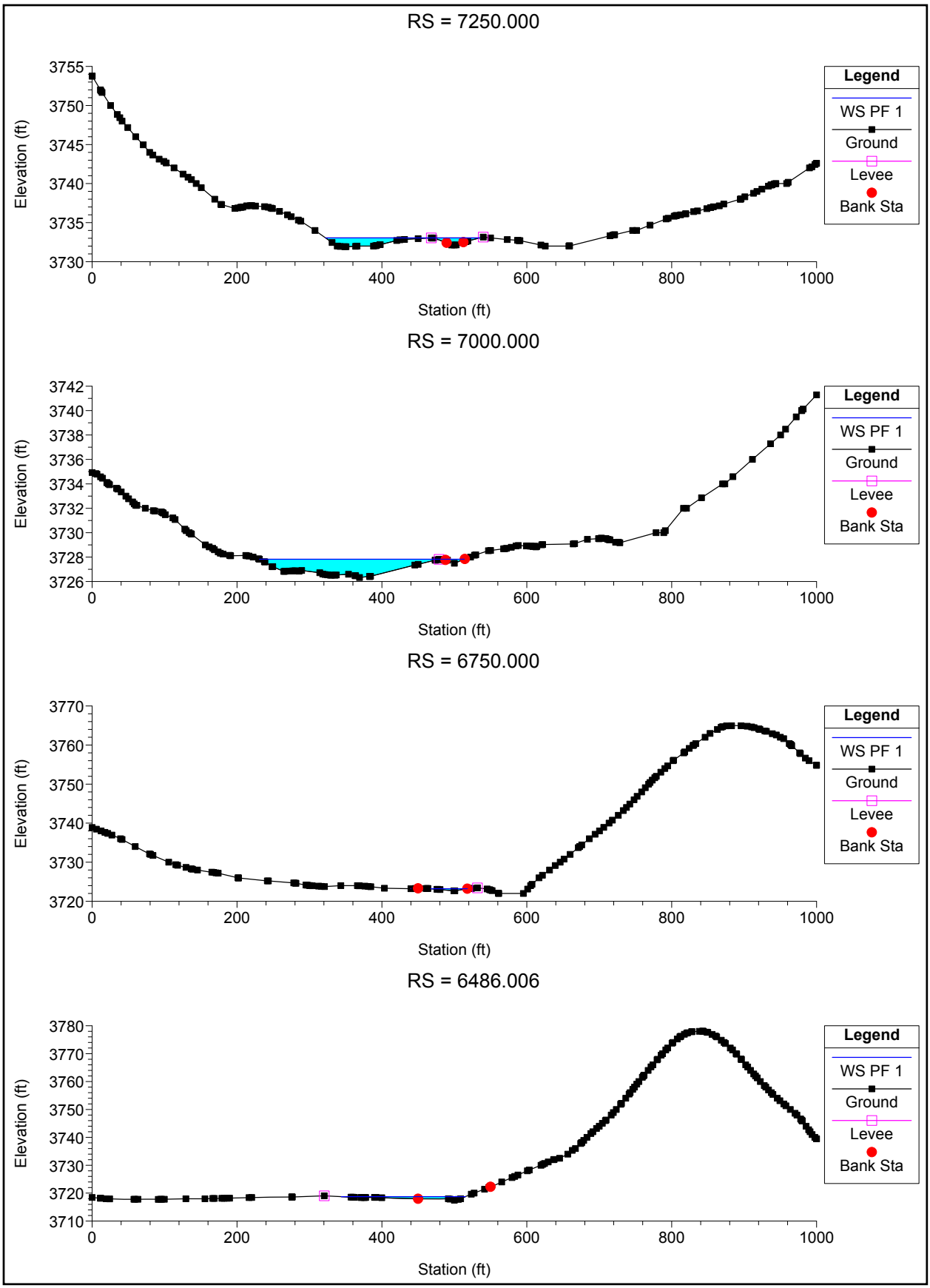
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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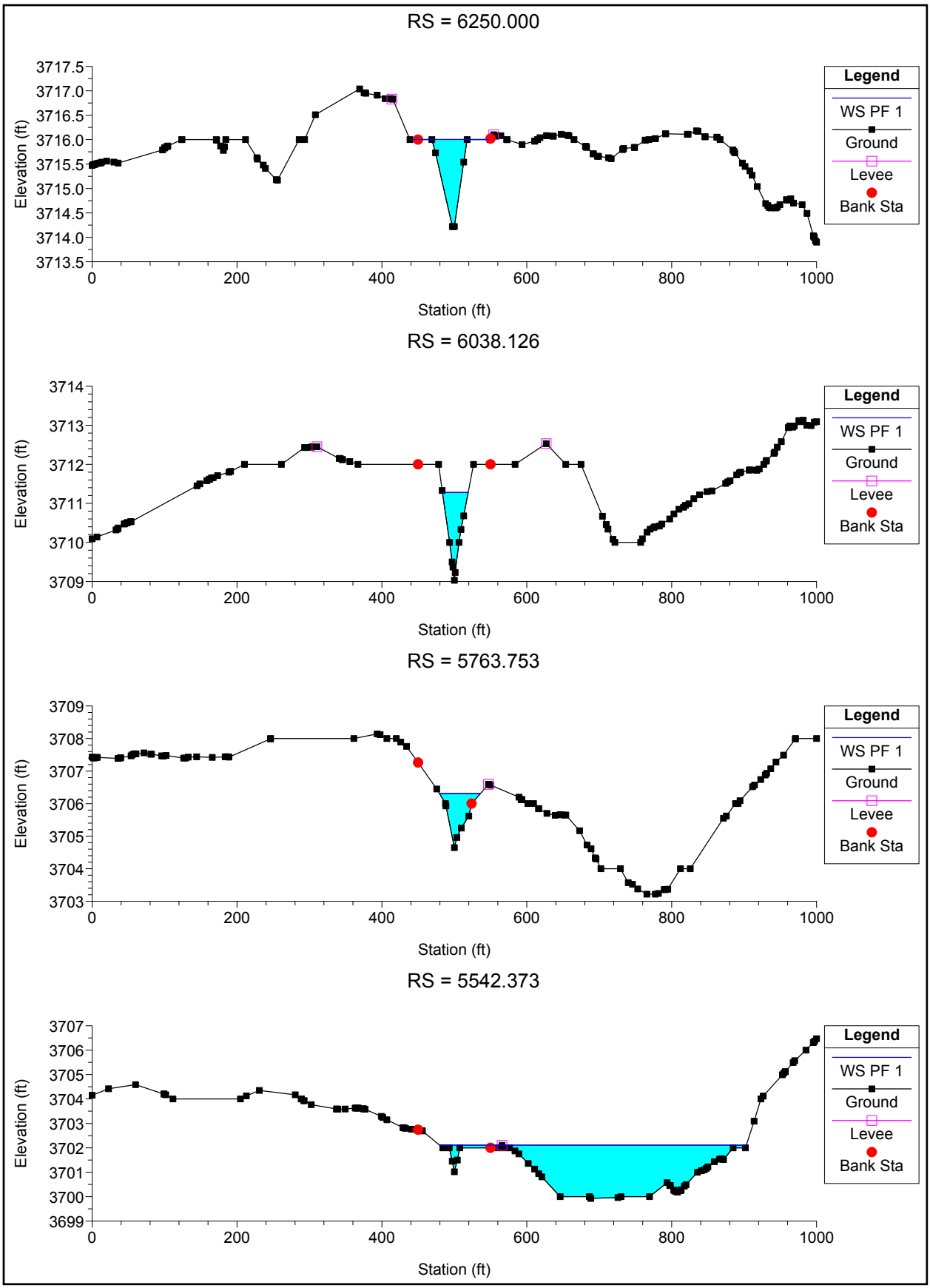
3750
3745
3740
3735
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7000.000
Elevation (ft)
3742
3740
3738
3736
3734
3732
3730
3728
3726
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6750.000
Elevation (ft)
3770
3760
3750
3740
3730
3720
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6486.006
Elevation (ft)
3780
3770
3760
3750
3740
3730
3720
3710
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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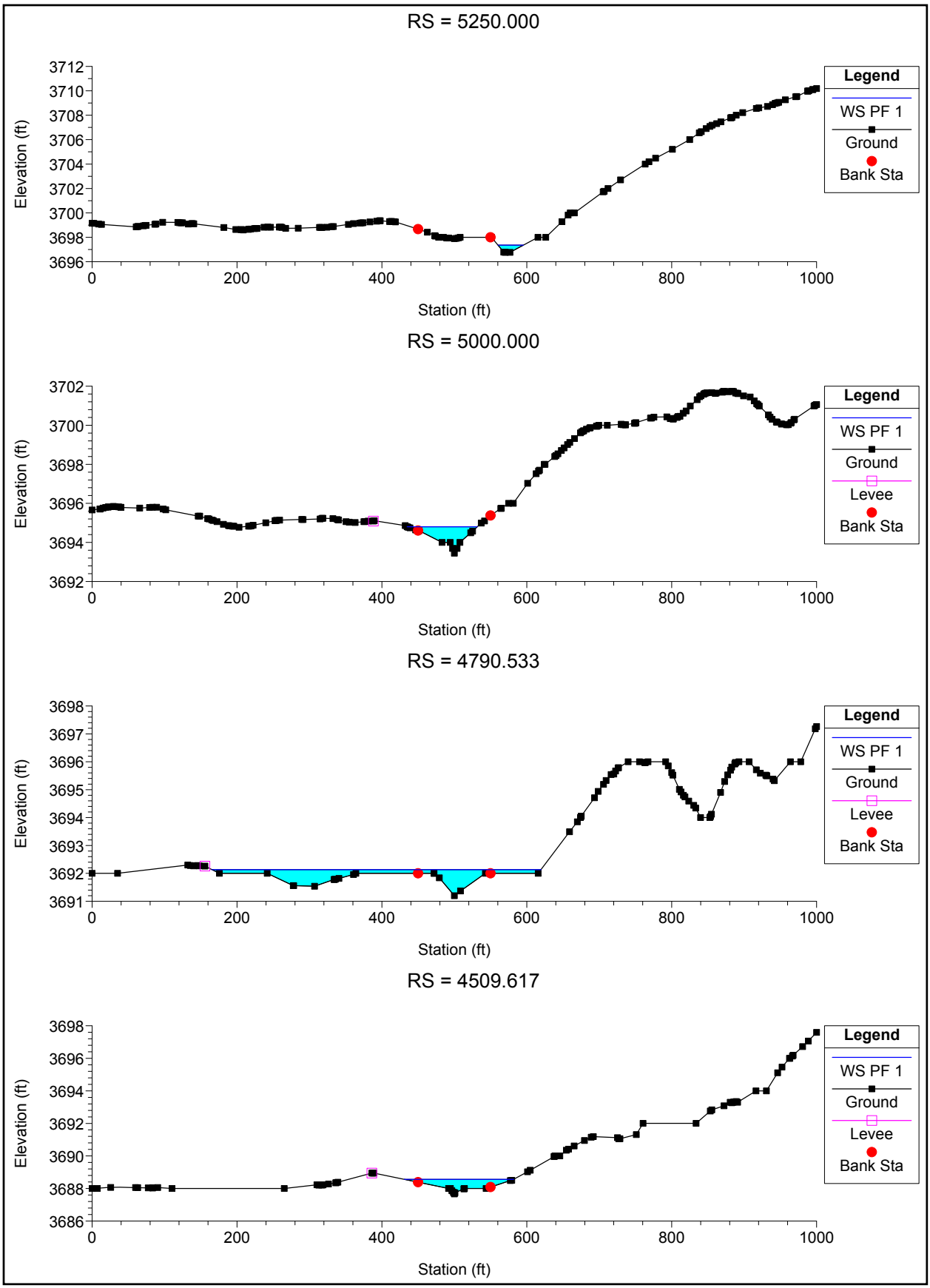
3716.5
3716.0
3715.5
3715.0
3714.5
3714.0
3713.5
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6038.126
Elevation (ft)
3714
3713
3712
3711
3710
3709
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5763.753
Elevation (ft)
3709
3708
3707
3706
3705
3704
3703
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5542.373
Elevation (ft)
3707
3706
3705
3704
3703
3702
3701
3700
3699
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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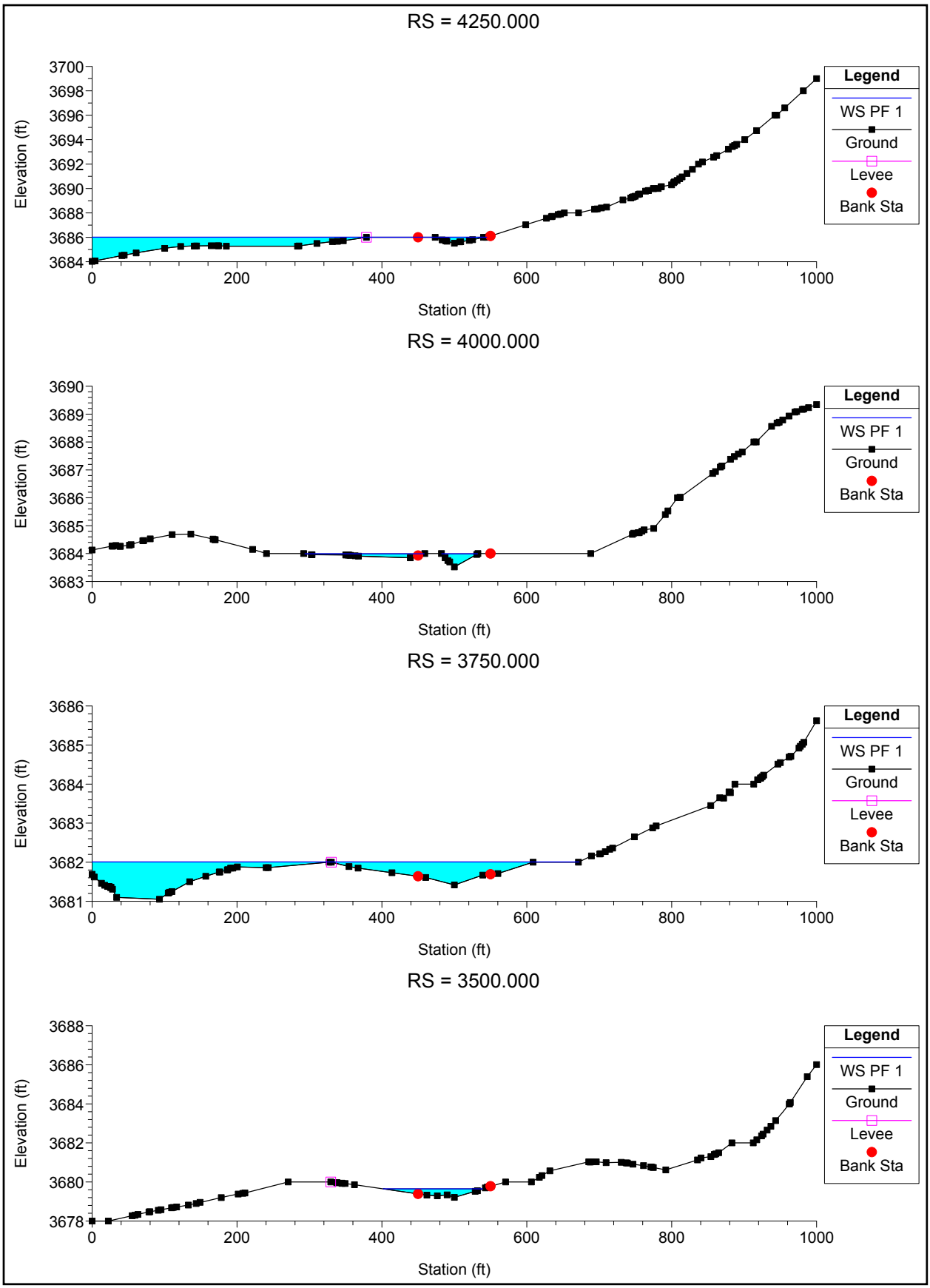
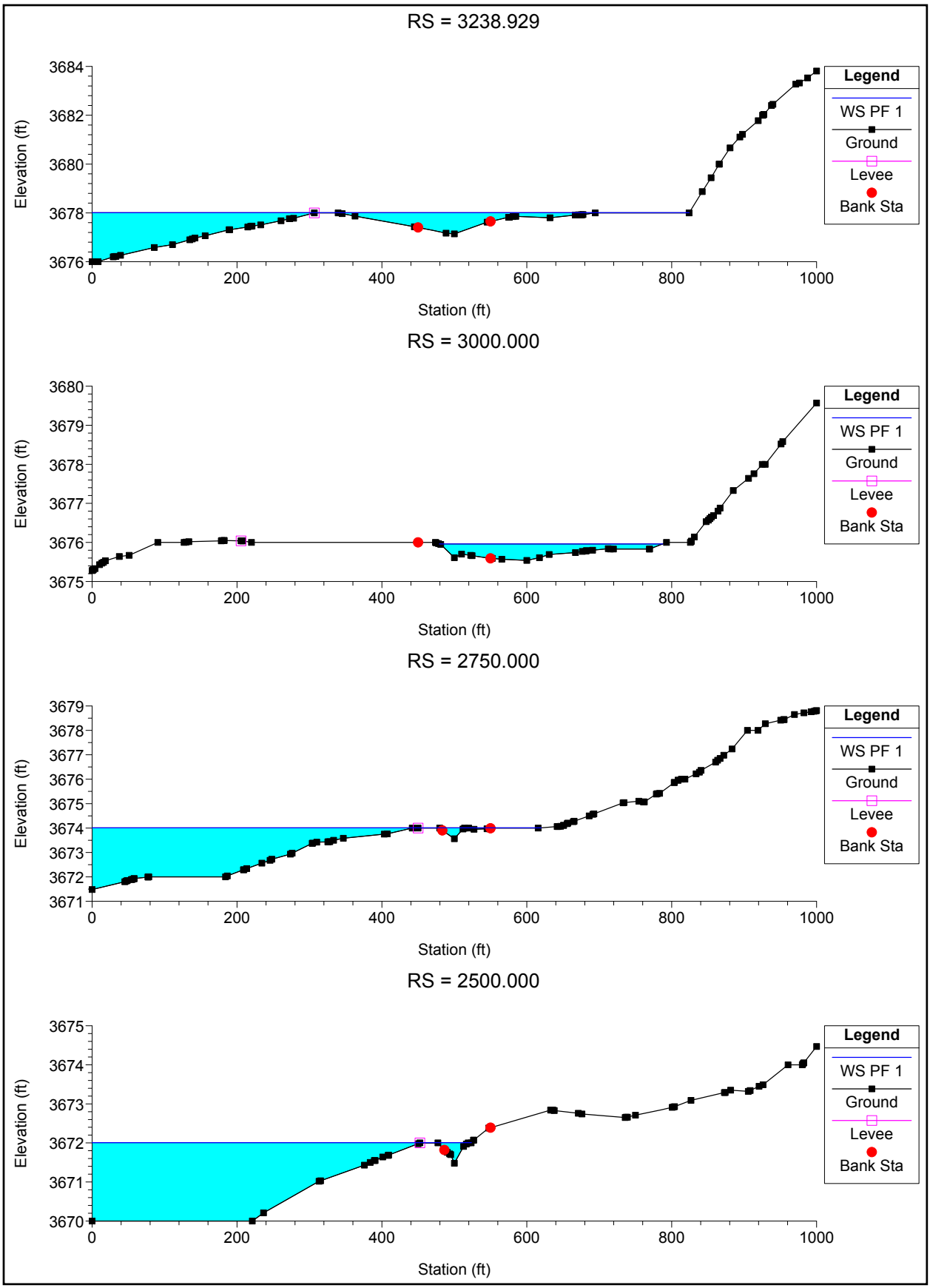
3710
3708
3706
3704
3702
3700
3698
3696
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
3702
3700
3698
3696
3694
3692
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4790.533
Elevation (ft)
3698
3697
3696
3695
3694
3693
3692
3691
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4509.617
Elevation (ft)
3698
3696
3694
3692
3690
3688
3686
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 4250.000
Elevation (ft)
3700
3698
3696
3694
3692
3690
3688
3686
3684
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4000.000
Elevation (ft)
3690
3689
3688
3687
3686
3685
3684
3683
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
3686
3685
3684
3683
3682
3681
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3500.000
Elevation (ft)
3688
3686
3684
3682
3680
3678
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 3238.929
Elevation (ft)
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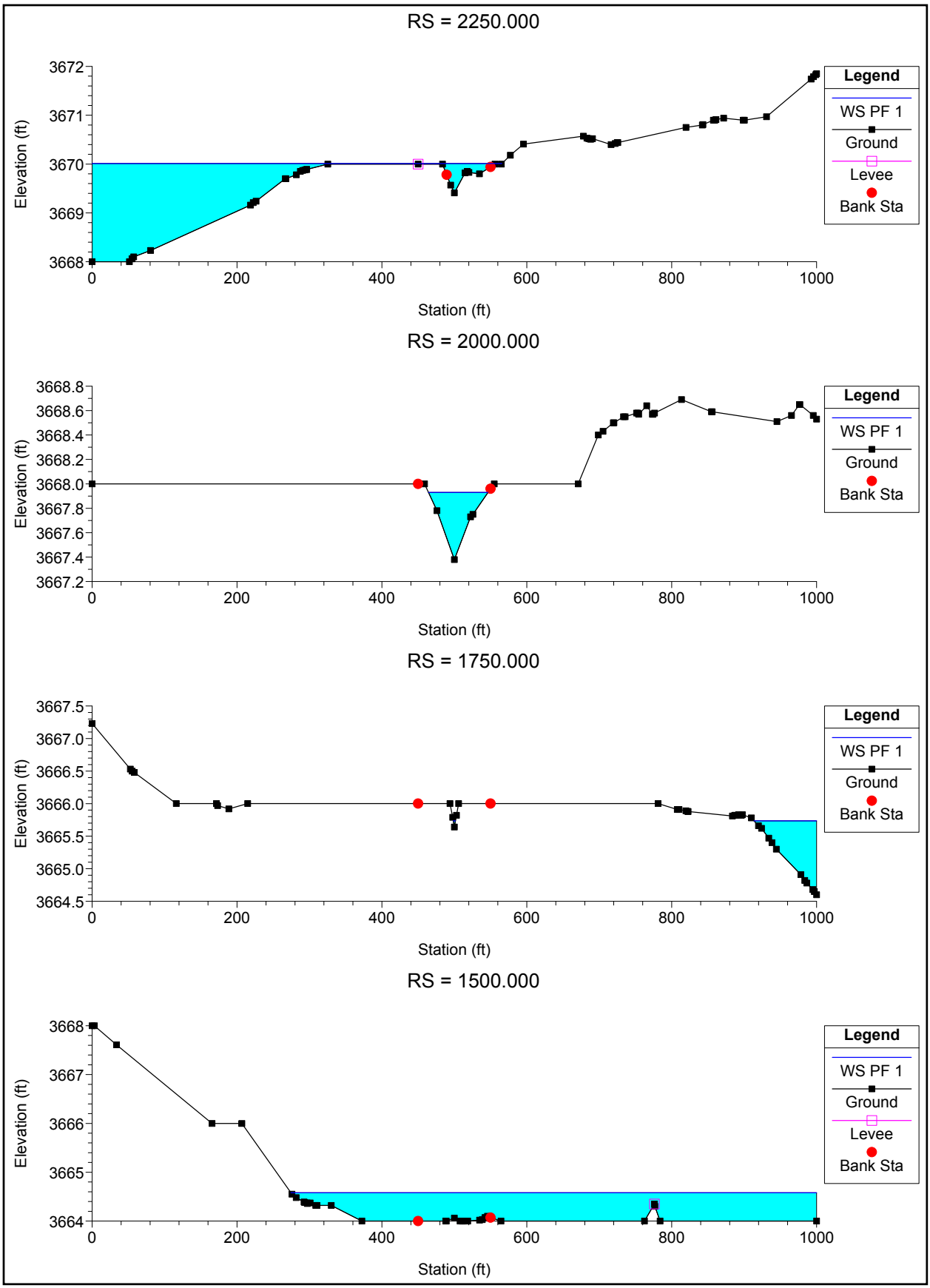
3682
3680
3678
3676
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3000.000
Elevation (ft)
3680
3679
3678
3677
3676
3675
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2750.000
Elevation (ft)
3679
3678
3677
3676
3675
3674
3673
3672
3671
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2500.000
Elevation (ft)
3675
3674
3673
3672
3671
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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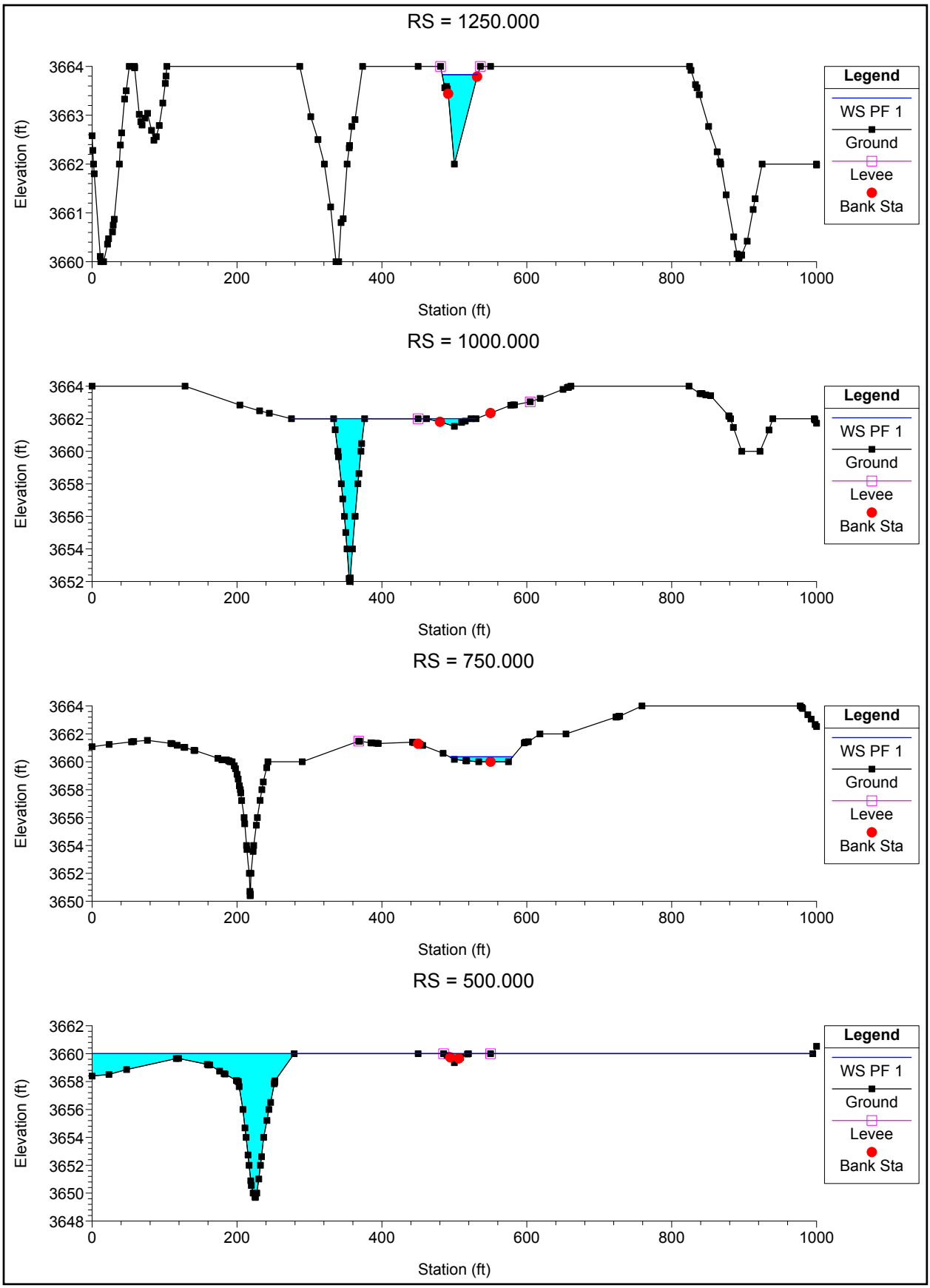
3671
3670
3669
3668
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2000.000
Elevation (ft)
3668.8
3668.6
3668.4
3668.2
3668.0
3667.8
3667.6
3667.4
3667.2
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3667.5
3667.0
3666.5
3666.0
3665.5
3665.0
3664.5
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
3668
3667
3666
3665
3664
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
3664
3663
3662
3661
3660
0
200
400
600
800
1000
Station (ft)
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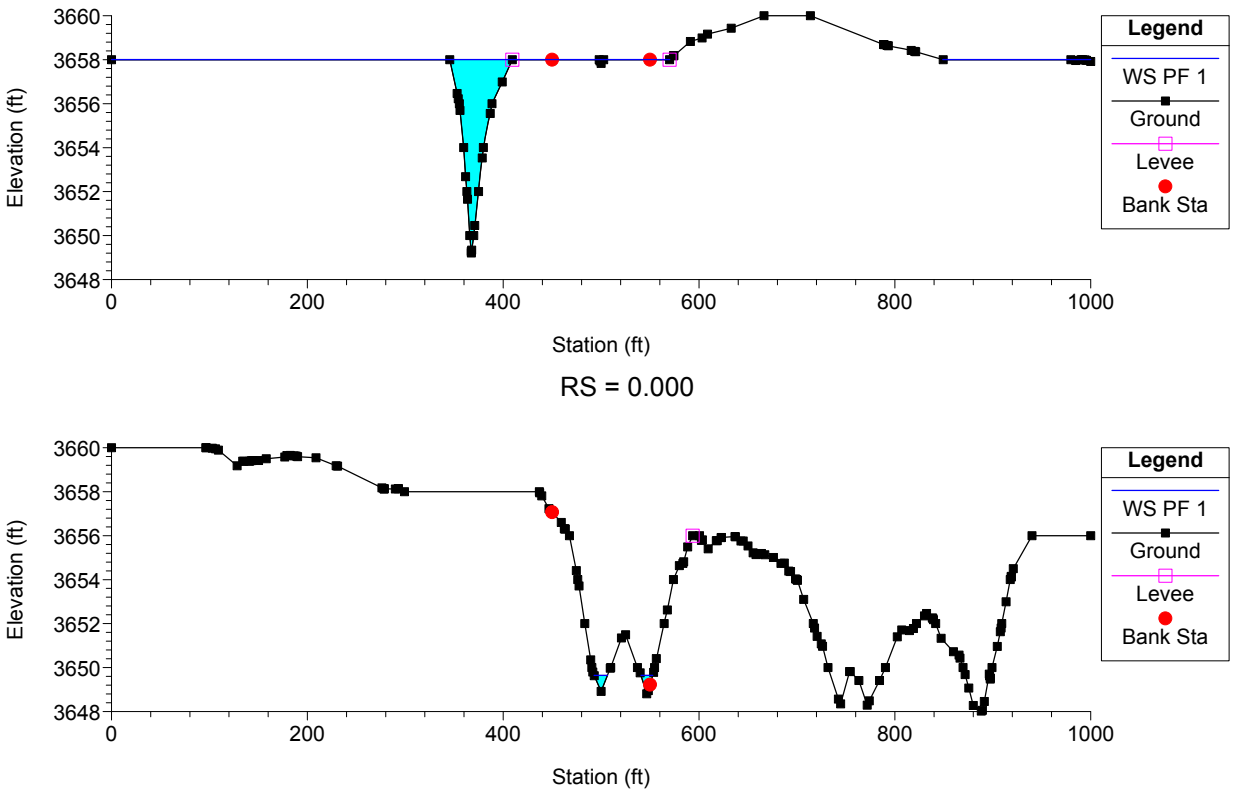
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
3664
3662
3660
3658
3656
3654
3652
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3664
3662
3660
3658
3656
3654
3652
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
3662
3660
3658
3656
3654
3652
3650
3648
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

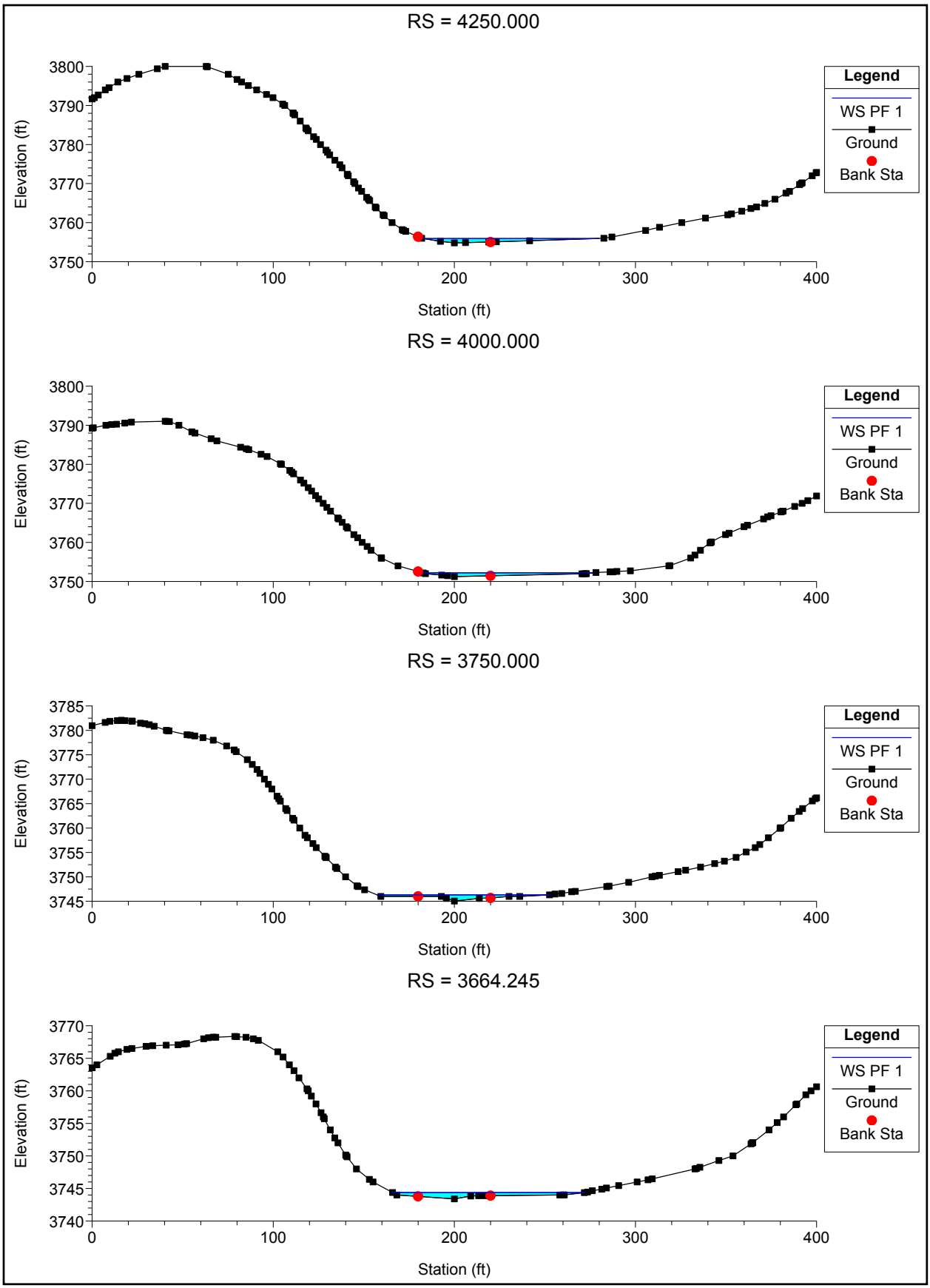

RS = 250.000
Elevation (ft)
3660
3658
3656
3654
3652
3650
3648
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 0.000
Elevation (ft)
3660
3658
3656
3654
3652
3650
3648
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-8

# HEC-RAS Channel 05

| 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) | |
| 5 | 4250 | PF 1 | 212 | 3754.83 | 3755.96 | 3755.88 | 3756.18 | 0.012612 | 4.23 | 59.12 | 97.33 | 0.82 |
| 5 | 4000 | PF 1 | 212 | 3751.25 | 3752.21 | 3752.21 | 3752.48 | 0.018876 | 4.59 | 52.41 | 93.94 | 0.97 |
| 5 | 3750 | PF 1 | 212 | 3745.06 | 3746.31 | 3746.41 | 3746.75 | 0.030981 | 5.83 | 43.39 | 95.23 | 1.24 |
| 5 | 3664.245 | PF 1 | 212 | 3743.41 | 3744.38 | 3744.39 | 3744.65 | 0.019445 | 4.66 | 53.77 | 106.2 | 0.98 |
| 5 | 3500 | PF 1 | 224 | 3740.22 | 3740.74 | 3740.8 | 3741.08 | 0.024974 | 3.19 | 50.02 | 102.48 | 0.98 |
| 5 | 3250 | PF 1 | 224 | 3734.99 | 3734.85 | 3734.85 | 3735.07 | 0.024274 | | 59.15 | 136.52 | 0 |
| 5 | 3000 | PF 1 | 224 | 3728.24 | 3729.19 | 3729.24 | 3729.51 | 0.020954 | 5.07 | 53.97 | 123.35 | 1.03 |
| 5 | 2750 | PF 1 | 224 | 3722.89 | 3724 | 3724 | 3724.03 | 0.0013 | 1.07 | 180.59 | 255.78 | 0.25 |
| 5 | 2500 | PF 1 | 224 | 3718.9 | 3719.16 | 3719.19 | 3723.47 | 1.529111 | 18.48 | 14.46 | 103.39 | 7.13 |
| 5 | 2250 | PF 1 | 369 | 3708.22 | 3710.73 | 3710.88 | 3711.54 | 0.020319 | 7.25 | 52.39 | 51.13 | 1.11 |
| 5 | 2000 | PF 1 | 369 | 3700.89 | 3702.4 | 3702.85 | 3703.87 | 0.057601 | 9.83 | 38.57 | 44.56 | 1.78 |
| 5 | 1750 | PF 1 | 369 | 3697.25 | 3700.22 | 3700.22 | 3701.16 | 0.015296 | 7.79 | 47.34 | 25.31 | 1 |
| 5 | 1500 | PF 1 | 369 | 3694.16 | 3696.43 | 3696.17 | 3696.64 | 0.004835 | 4.13 | 109.2 | 106.38 | 0.57 |
| 5 | 1250 | PF 1 | 369 | 3692.15 | 3694.19 | 3694.19 | 3694.76 | 0.014747 | 6.26 | 62.33 | 52.58 | 0.95 |
| 5 | 1000 | PF 1 | 369 | 3688.71 | 3692.14 | 3692.01 | 3692.22 | 0.002815 | 2.9 | 183.83 | 331.37 | 0.42 |
| 5 | 750 | PF 1 | 369 | 3686.34 | 3691.33 | 3689.97 | 3691.55 | 0.002539 | 3.85 | 100.3 | 51.16 | 0.43 |
| 5 | 500 | PF 1 | 369 | 3686 | 3691.39 | | 3691.42 | 0.000145 | 1.52 | 267.89 | 66.3 | 0.12 |
| 5 | 250 | PF 1 | 369 | 3686 | 3690.29 | 3690.29 | 3691.22 | 0.015749 | 7.75 | 47.61 | 25.56 | 1 |
| 5 | 0 | PF 1 | 369 | 3681.44 | 3686.13 | 3685 | 3686.38 | 0.003004 | 3.99 | 94.44 | 48.34 | 0.46 |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3780
3770
3760
3750
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4000.000
Elevation (ft)
3800
3790
3780
3770
3760
3750
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
3785
3780
3775
3770
3765
3760
3755
3750
3745
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3664.245
Elevation (ft)
3770
3765
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3755
3750
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3740
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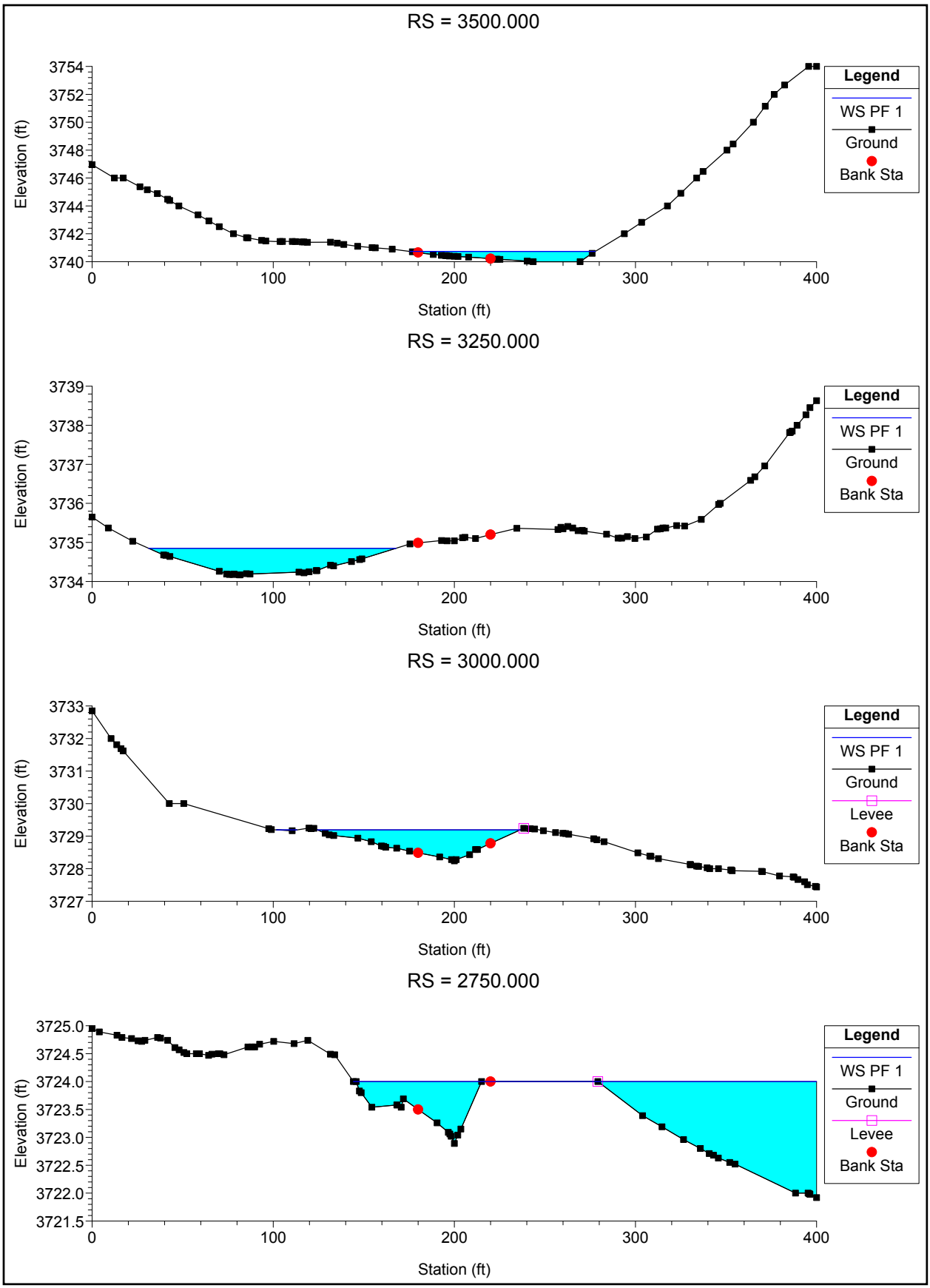
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 3500.000
Elevation (ft)
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3744
3742
3740
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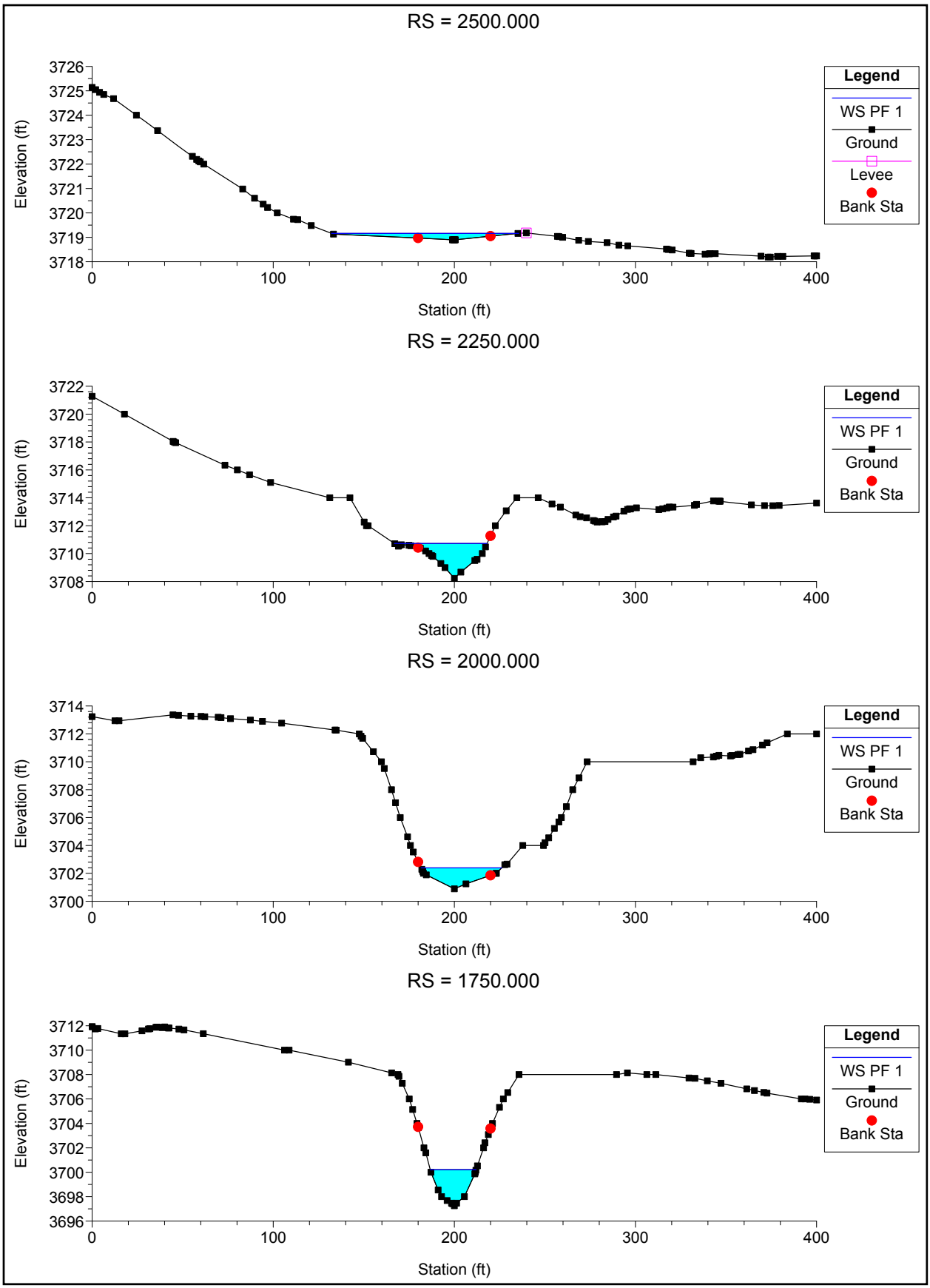
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3250.000
Elevation (ft)
3739
3738
3737
3736
3735
3734
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3000.000
Elevation (ft)
3733
3732
3731
3730
3729
3728
3727
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2750.000
Elevation (ft)
3725.0
3724.5
3724.0
3723.5
3723.0
3722.5
3722.0
3721.5
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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3725
3724
3723
3722
3721
3720
3719
3718
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2250.000
Elevation (ft)
3722
3720
3718
3716
3714
3712
3710
3708
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
3714
3712
3710
3708
3706
3704
3702
3700
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3712
3710
3708
3706
3704
3702
3700
3698
3696
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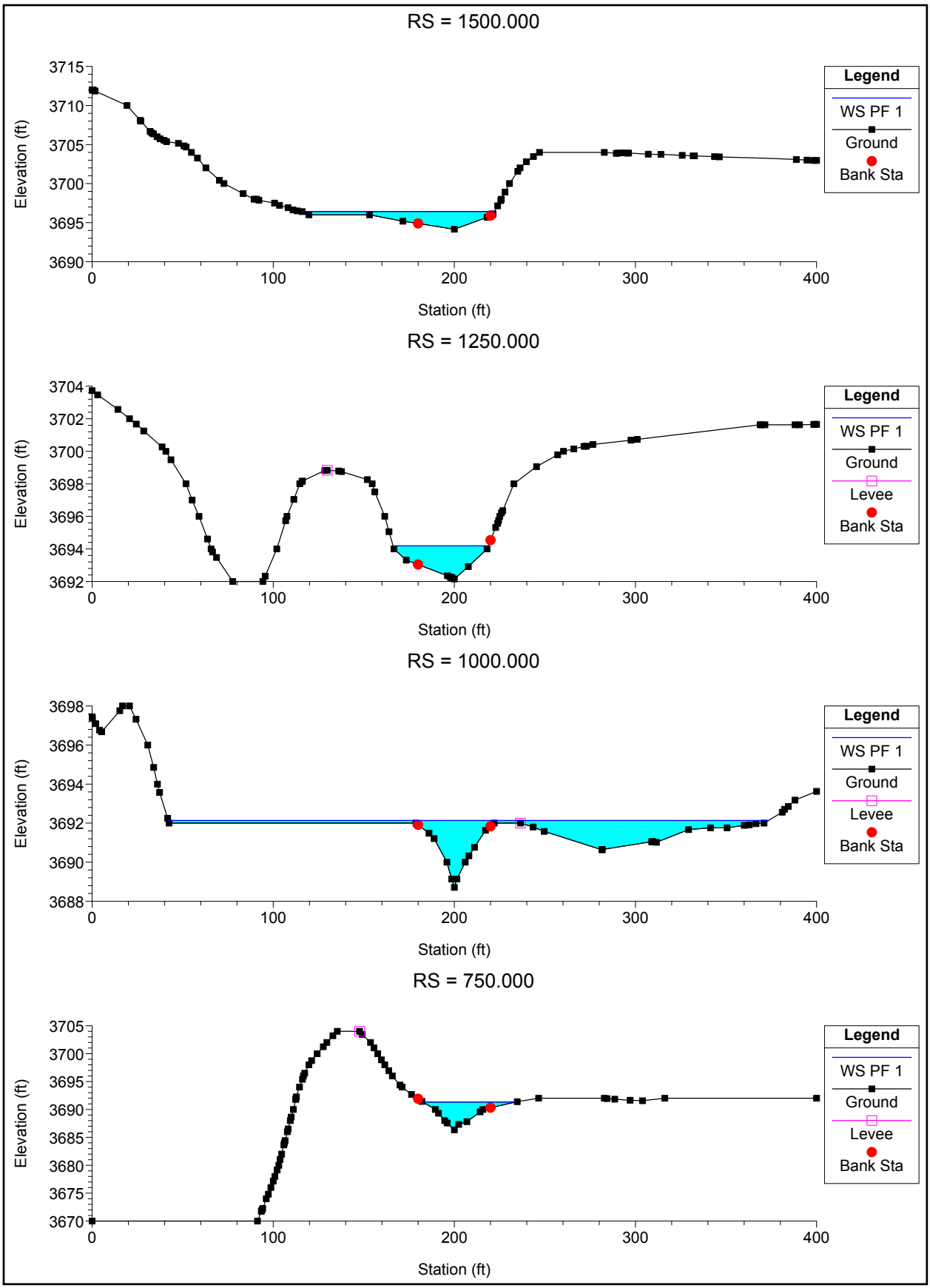
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 1500.000
Elevation (ft)
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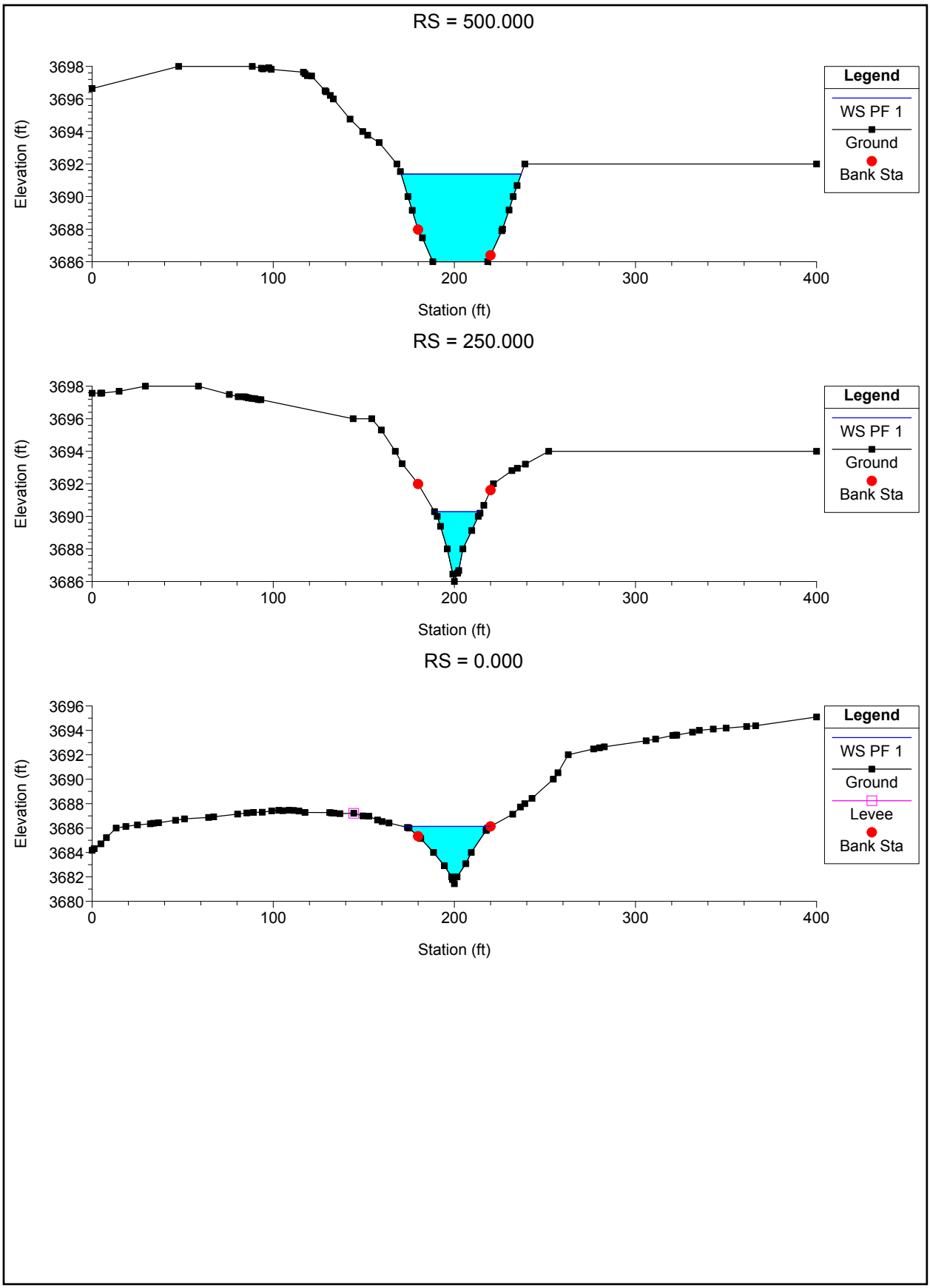
3705
3700
3695
3690
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
3704
3702
3700
3698
3696
3694
3692
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
3698
3696
3694
3692
3690
3688
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3705
3700
3695
3690
3685
3680
3675
3670
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3694
3692
3690
3688
3686
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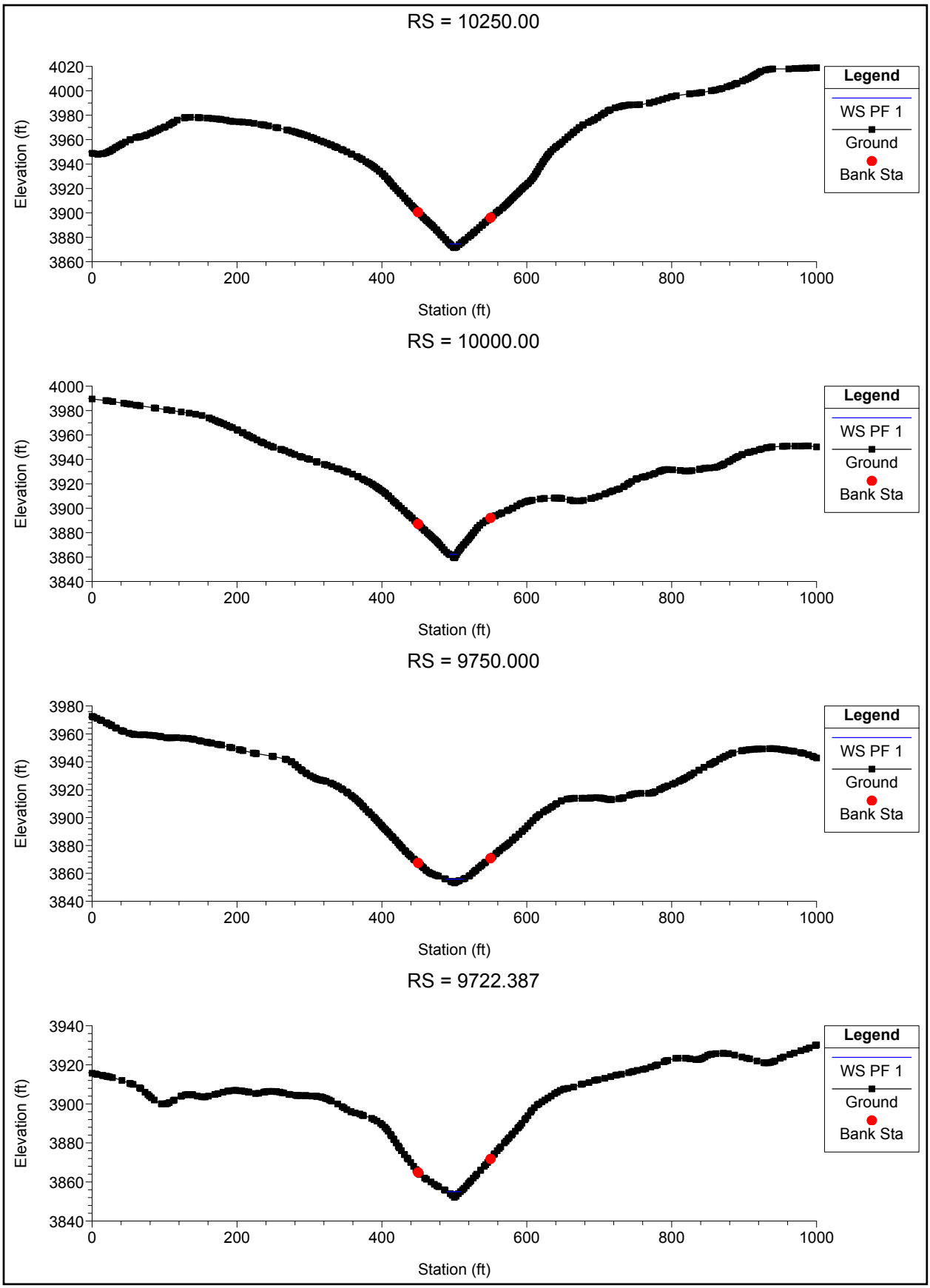
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3698
3696
3694
3692
3690
3688
3686
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 0.000
Elevation (ft)
3696
3694
3692
3690
3688
3686
3684
3682
3680
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-9

# HEC-RAS Channel 07

| 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) | |
| 7 | 10250 | PF 1 | 205 | 3871.43 | 3874.6 | 3874.71 | 3875.64 | 0.020013 | 8.22 | 24.94 | 14.14 | 1.09 |
| 7 | 10000 | PF 1 | 205 | 3859.4 | 3862.24 | 3863.31 | 3865.82 | 0.103019 | 15.18 | 13.5 | 9.75 | 2.27 |
| 7 | 9750 | PF 1 | 205 | 3853.15 | 3855.89 | 3855.93 | 3856.58 | 0.018285 | 6.66 | 30.79 | 23.99 | 1.04 |
| 7 | 9722.387 | PF 1 | 205 | 3852.11 | 3855.05 | 3855.2 | 3856 | 0.022491 | 7.86 | 26.1 | 18.09 | 1.15 |
| 7 | 9500 | PF 1 | 205 | 3846.68 | 3849.62 | 3849.86 | 3850.71 | 0.025291 | 8.39 | 24.43 | 16.57 | 1.22 |
| 7 | 9250 | PF 1 | 205 | 3841.92 | 3843.94 | 3844.05 | 3844.71 | 0.022435 | 7.07 | 29.01 | 24.32 | 1.14 |
| 7 | 9000 | PF 1 | 205 | 3836.42 | 3839.43 | 3839.43 | 3840.19 | 0.016705 | 6.96 | 29.45 | 19.64 | 1 |
| 7 | 8750 | PF 1 | 205 | 3821.9 | 3823.01 | 3824.13 | 3828.91 | 0.318479 | 19.49 | 10.52 | 14.07 | 3.97 |
| 7 | 8500 | PF 1 | 205 | 3805.94 | 3808.59 | 3808.98 | 3809.95 | 0.032593 | 9.35 | 21.93 | 15.35 | 1.38 |
| 7 | 8250 | PF 1 | 205 | 3800.63 | 3803.81 | 3803.81 | 3804.58 | 0.016654 | 7.09 | 28.93 | 18.58 | 1 |
| 7 | 8000 | PF 1 | 205 | 3795.55 | 3798.21 | 3798.54 | 3799.38 | 0.035 | 8.67 | 23.63 | 19.82 | 1.4 |
| 7 | 7750 | PF 1 | 205 | 3791.78 | 3793.55 | 3793.55 | 3794.09 | 0.018034 | 5.9 | 34.72 | 32.69 | 1.01 |
| 7 | 7500 | PF 1 | 205 | 3785.7 | 3788.71 | 3788.77 | 3789.41 | 0.020281 | 6.74 | 30.42 | 24.85 | 1.07 |
| 7 | 7250 | PF 1 | 205 | 3781.81 | 3784.71 | 3784.71 | 3785.37 | 0.01683 | 6.5 | 31.56 | 23.87 | 1 |
| 7 | 7000 | PF 1 | 205 | 3777.07 | 3779.92 | 3779.19 | 3780.03 | 0.003028 | 2.8 | 75.89 | 60.57 | 0.43 |
| 7 | 6750 | PF 1 | 784 | 3776 | 3777.06 | 3777.06 | 3777.55 | 0.017997 | 5.42 | 138.84 | 140.73 | 0.99 |
| 7 | 6500 | PF 1 | 784 | 3768.35 | 3770.43 | 3770.76 | 3771.61 | 0.035067 | 8.7 | 90.09 | 78.51 | 1.43 |
| 7 | 6250 | PF 1 | 784 | 3765.44 | 3767.55 | 3767.55 | 3768.26 | 0.016065 | 6.76 | 116.33 | 84.91 | 1 |
| 7 | 6000 | PF 1 | 784 | 3762.19 | 3764.47 | 3764.47 | 3764.94 | 0.013614 | 5.73 | 148.84 | 155.89 | 0.9 |
| 7 | 5741.994 | PF 1 | 784 | 3753.65 | 3757.71 | 3758.57 | 3760.12 | 0.029507 | 12.46 | 62.92 | 26.72 | 1.43 |
| 7 | 5500 | PF 1 | 784 | 3748.37 | 3752.45 | 3752.7 | 3753.69 | 0.022469 | 8.93 | 87.76 | 51.74 | 1.21 |
| 7 | 5250 | PF 1 | 784 | 3745.07 | 3748.48 | 3748.53 | 3749.1 | 0.016678 | 5.16 | 127.66 | 111.03 | 0.94 |
| 7 | 5000 | PF 1 | 784 | 3741.86 | 3744.48 | 3744.29 | 3744.97 | 0.009811 | 5.68 | 143.08 | 104.78 | 0.8 |
| 7 | 4750 | PF 1 | 784 | 3738.86 | 3741.93 | 3741.67 | 3742.62 | 0.009886 | 6.68 | 117.45 | 58.61 | 0.83 |
| 7 | 4500 | PF 1 | 784 | 3736.52 | 3738.97 | 3738.97 | 3739.53 | 0.017776 | 6.13 | 131.43 | 123.57 | 1.02 |
| 7 | 4250 | PF 1 | 784 | 3733.33 | 3736 | 3736 | 3736.03 | 0.000742 | 1.27 | 628.84 | 609.67 | 0.21 |
| 7 | 4000 | PF 1 | 784 | 3730 | 3730.51 | 3731.24 | 3734.97 | 0.472037 | 16.86 | 46.28 | 104.58 | 4.48 |
| 7 | 3750 | PF 1 | 784 | 3724.5 | 3726.75 | 3726.59 | 3727.21 | 0.010557 | 5.55 | 147 | 112.25 | 0.82 |
| 7 | 3500 | PF 1 | 784 | 3724.89 | 3726.61 | | 3726.65 | 0.0007 | 1.28 | 476.29 | 278.83 | 0.2 |
| 7 | 3263.561 | PF 1 | 784 | 3724 | 3725.73 | 3725.73 | 3726.17 | 0.014092 | 5.63 | 154.09 | 168.15 | 0.91 |
| 7 | 3219.486 | PF 1 | 784 | 3719.48 | 3719.59 | 3720.32 | 3724.06 | 0.349619 | 4.53 | 46.42 | 100.29 | 2.88 |
| 7 | 3000 | PF 1 | 784 | 3714.7 | 3716.36 | 3716.26 | 3716.75 | 0.011507 | 5.25 | 162.82 | 162.28 | 0.83 |
| 7 | 2813.1 | PF 1 | 1022 | 3711.59 | 3713.57 | 3713.57 | 3714.28 | 0.014738 | 6.93 | 154.03 | 110.62 | 0.98 |
| 7 | 2539.204 | PF 1 | 1022 | 3707.85 | 3709.35 | 3709.51 | 3710.09 | 0.025109 | 7.61 | 152.04 | 158.15 | 1.22 |
| 7 | 2250 | PF 1 | 1022 | 3701.34 | 3703.65 | 3703.69 | 3704.45 | 0.016426 | 7.22 | 144.06 | 100.53 | 1.03 |
| 7 | 2000 | PF 1 | 1022 | 3696.66 | 3699.86 | 3699.86 | 3700.85 | 0.014522 | 7.96 | 128.33 | 65.55 | 1 |
| 7 | 1750 | PF 1 | 1022 | 3693.43 | 3695.99 | 3696.25 | 3697.27 | 0.021425 | 9.08 | 113.46 | 67.58 | 1.2 |
| 7 | 1500 | PF 1 | 1022 | 3689.66 | 3692.19 | 3692.33 | 3693.07 | 0.016956 | 7.55 | 138.41 | 109.65 | 1.05 |
| 7 | 1250 | PF 1 | 1022 | 3687.09 | 3689.84 | 3689.83 | 3690.65 | 0.013564 | 7.27 | 143.85 | 92.39 | 0.96 |
| 7 | 1000 | PF 1 | 1022 | 3685.63 | 3689.07 | | 3689.31 | 0.002513 | 4.11 | 265.4 | 116.17 | 0.44 |
| 7 | 750 | PF 1 | 1022 | 3684.81 | 3687.95 | | 3688.42 | 0.005818 | 5.83 | 195.72 | 105.83 | 0.66 |
| 7 | 500 | PF 1 | 1022 | 3683.97 | 3687.03 | | 3687.28 | 0.003427 | 4.18 | 259.89 | 138.97 | 0.5 |
| 7 | 250 | PF 1 | 1022 | 3682.35 | 3685.03 | 3685.03 | 3685.69 | 0.015286 | 6.74 | 158.82 | 119.27 | 0.98 |
| 7 | 0 | PF 1 | 1022 | 3673.48 | 3674.55 | 3675.21 | 3677.3 | 0.165894 | 12.9 | 78.86 | 133.64 | 2.83 |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Station (ft)
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WS PF 1
Ground
Bank Sta
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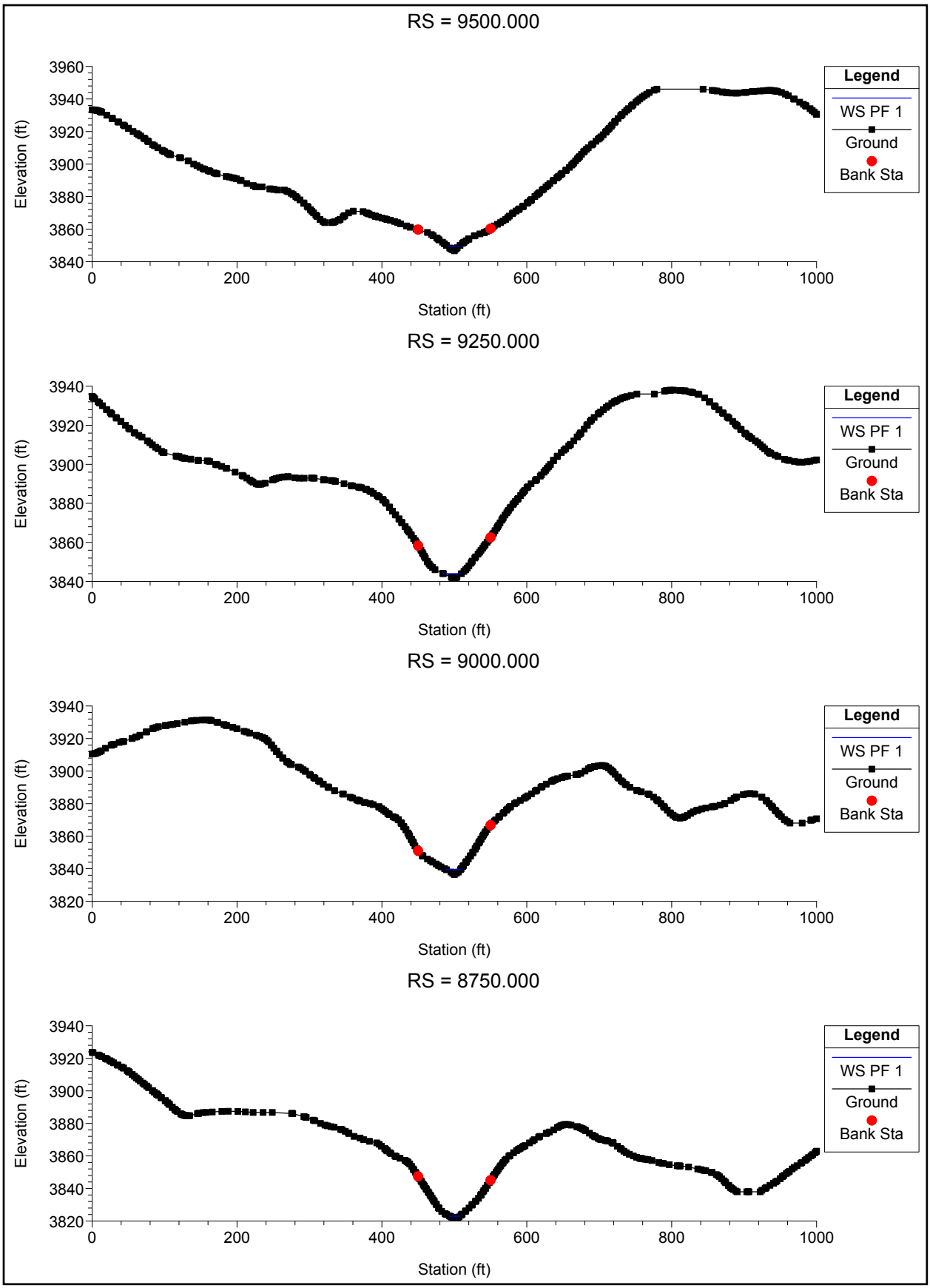
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9722.387
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9250.000
Elevation (ft)
3940
3920
3900
3880
3860
3840
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9000.000
Elevation (ft)
3940
3920
3900
3880
3860
3840
3820
0
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 8750.000
Elevation (ft)
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3920
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Station (ft)
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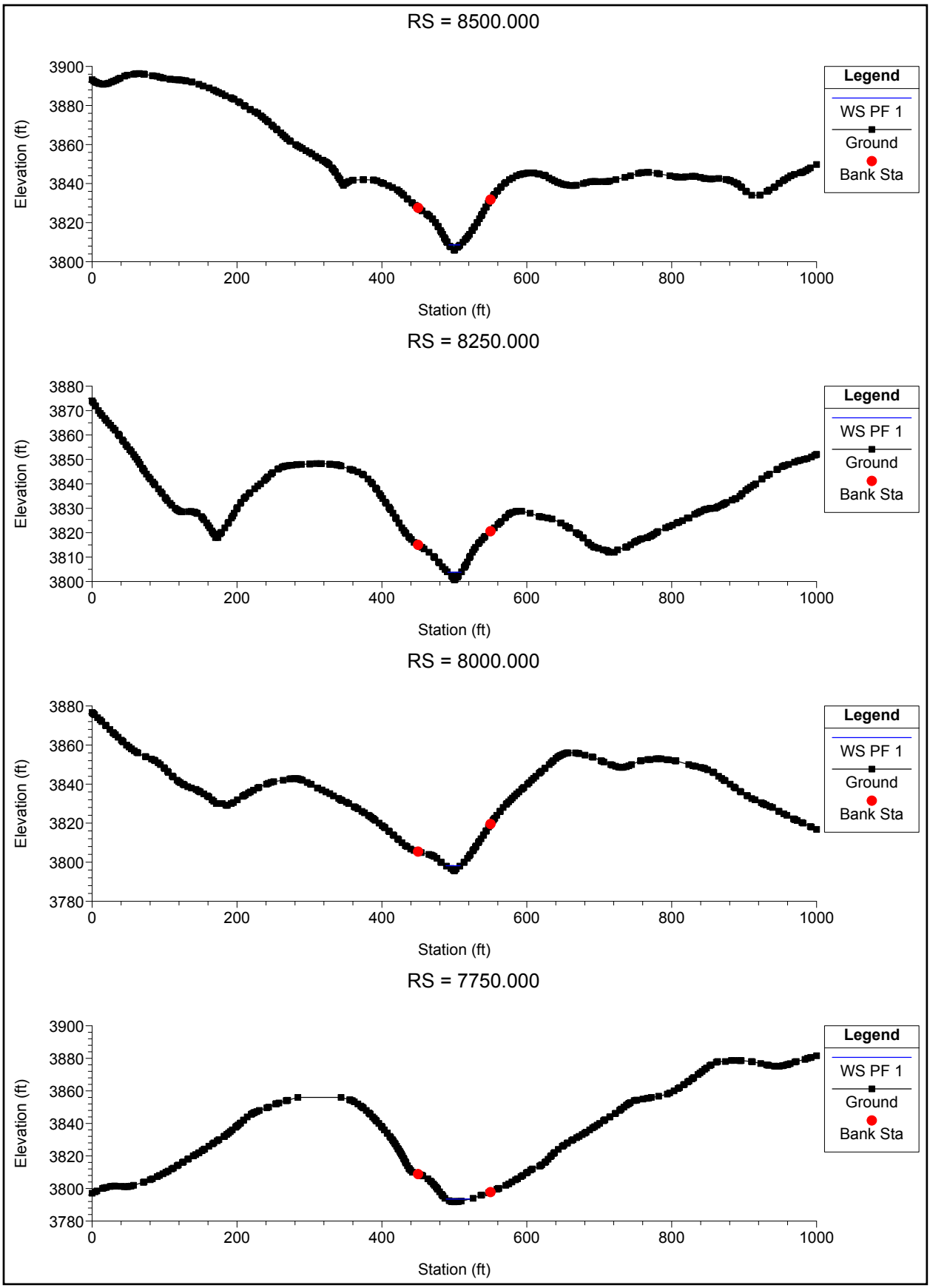
Bank Sta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600
800
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Legend
WS PF 1
Ground
Bank Sta
RS = 8250.000
Elevation (ft)
3880
3870
3860
3850
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 8000.000
Elevation (ft)
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3860
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400
600
800
1000
Station (ft)
Legend
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Ground
Bank Sta
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Elevation (ft)
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3880
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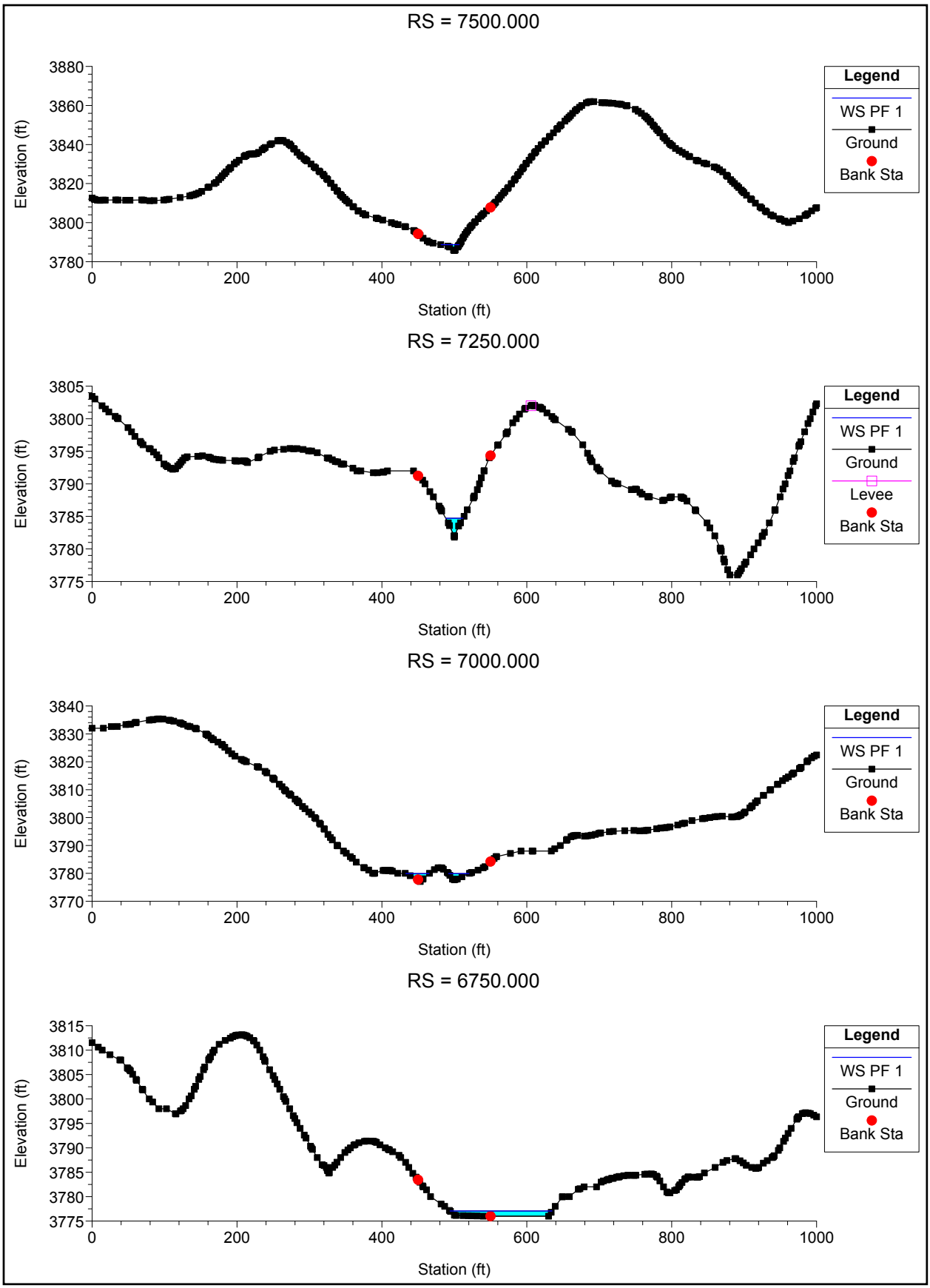
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7250.000
Elevation (ft)
3805
3800
3795
3790
3785
3780
3775
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7000.000
Elevation (ft)
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3830
3820
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3790
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3770
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600
800
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Station (ft)
Legend
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Ground
Bank Sta
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3805
3800
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Station (ft)
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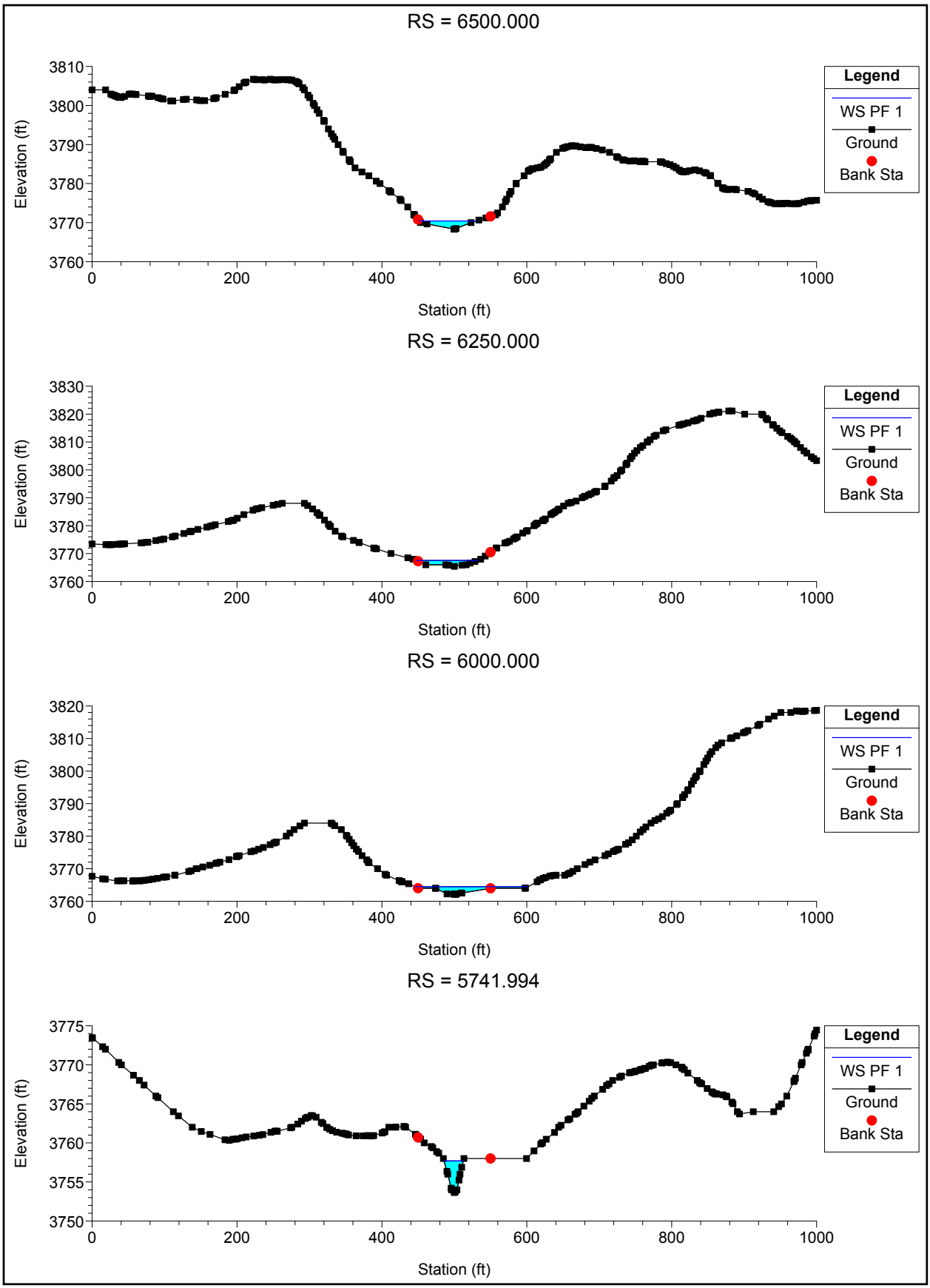
Ground
Bank Sta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800
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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6250.000
Elevation (ft)
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3820
3810
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Station (ft)
Legend
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Ground
Bank Sta
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Elevation (ft)
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1000
Station (ft)
Legend
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Ground
Bank Sta
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1000
Station (ft)
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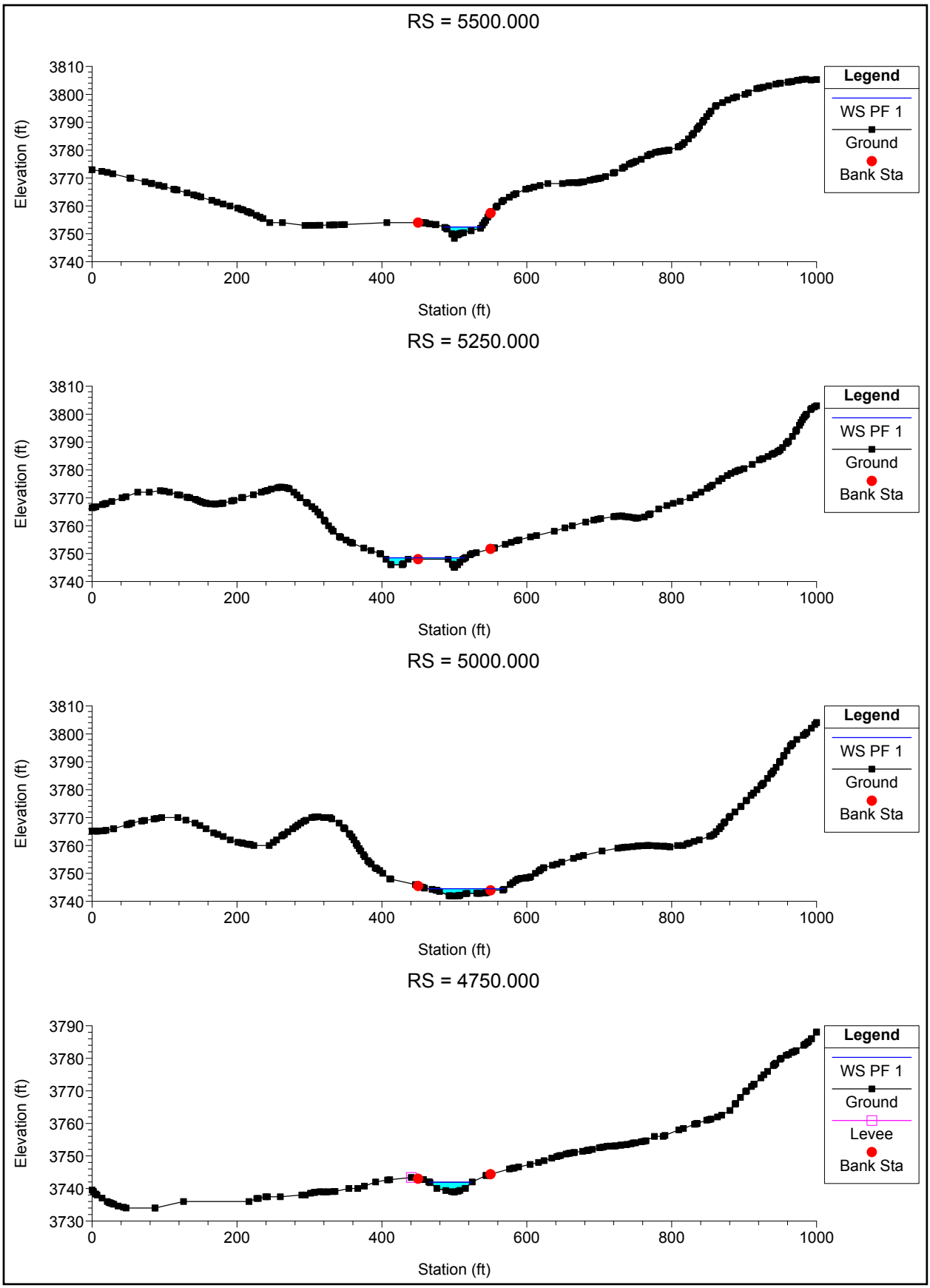
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
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Ground
Bank Sta
RS = 4750.000
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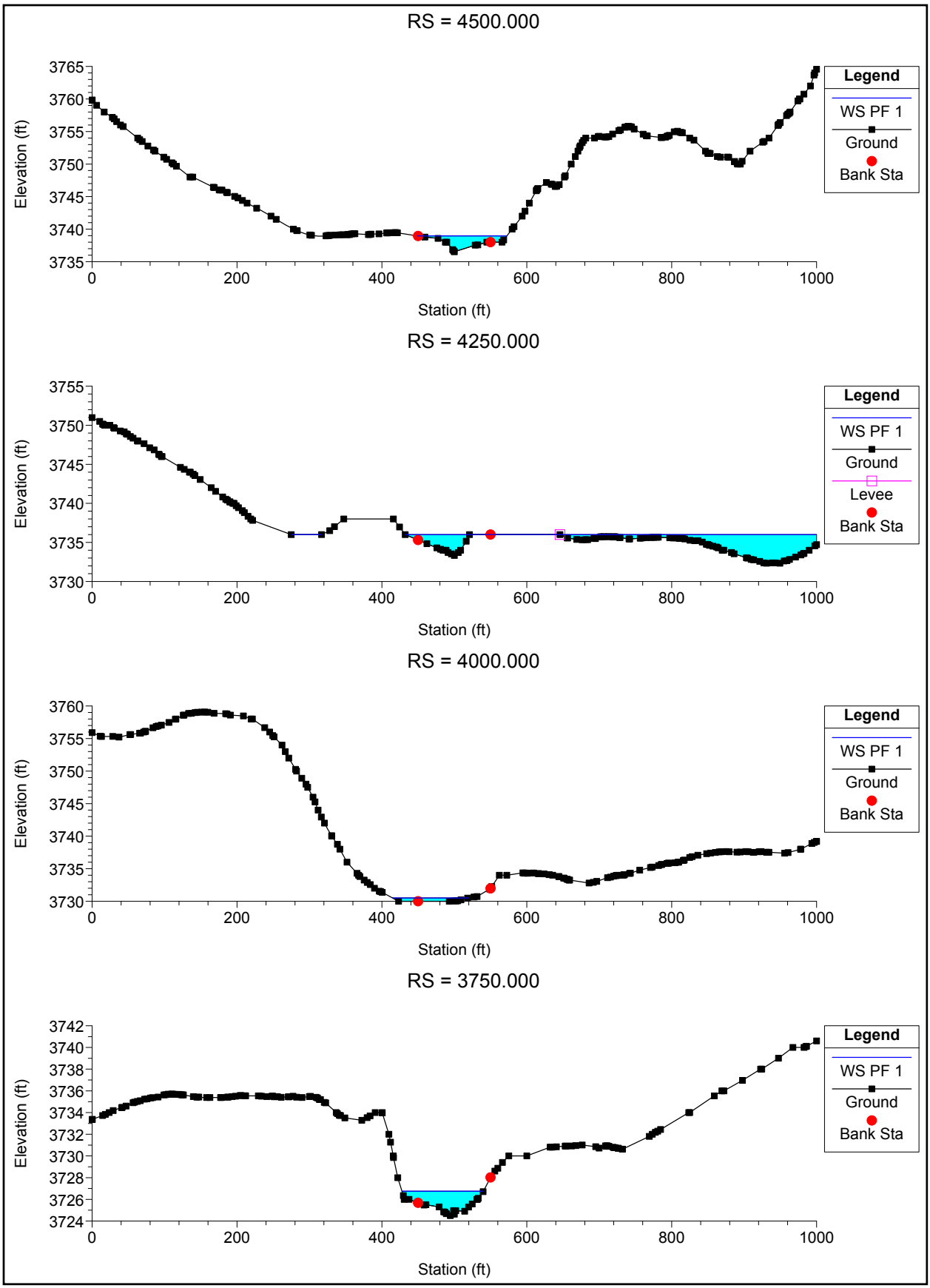
3760
3750
3740
3730
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4250.000
Elevation (ft)
3755
3750
3745
3740
3735
3730
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4000.000
Elevation (ft)
3760
3755
3750
3745
3740
3735
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
3742
3740
3738
3736
3734
3732
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3726
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600
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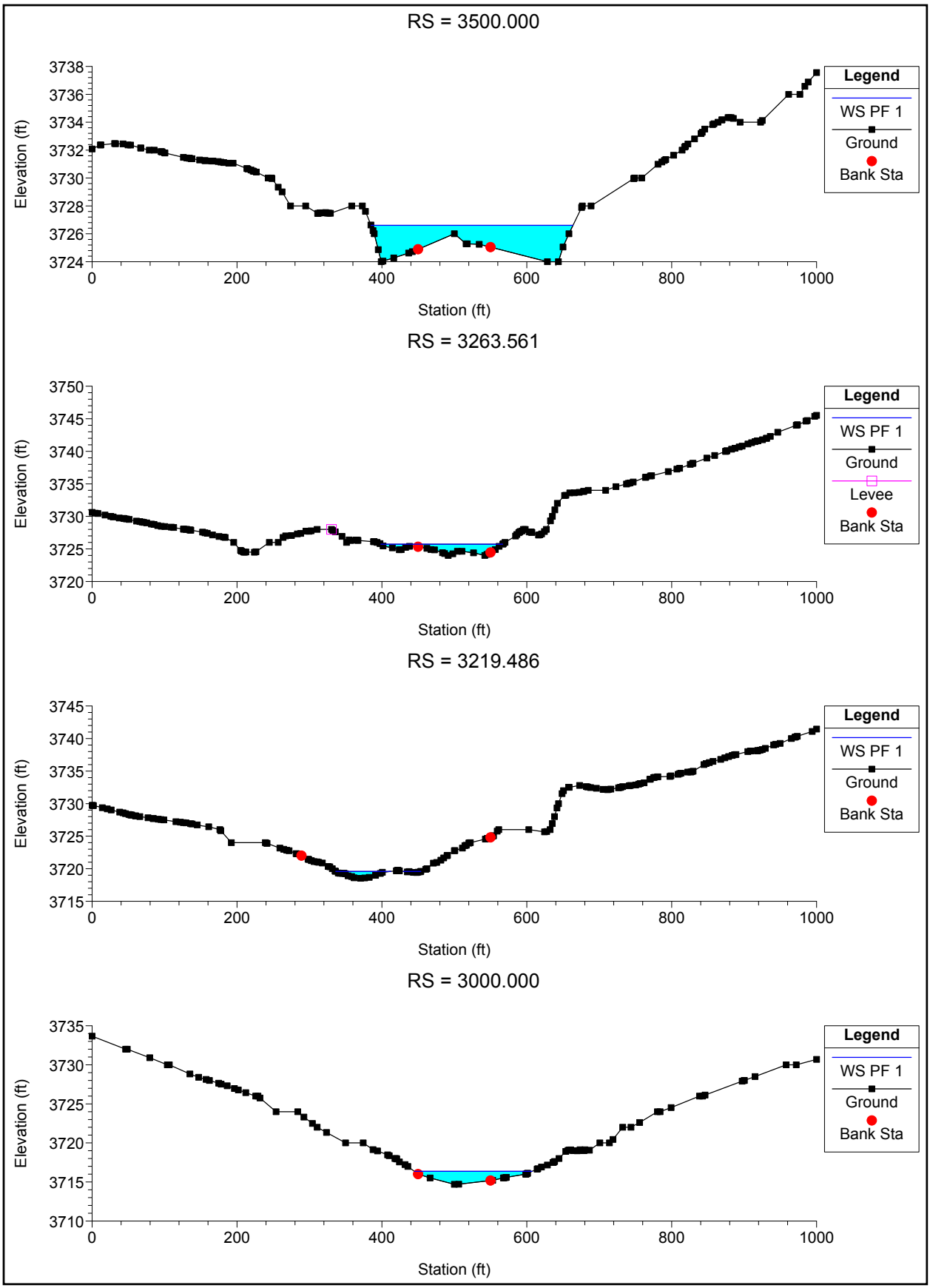
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3732
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3724
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3263.561
Elevation (ft)
3750
3745
3740
3735
3730
3725
3720
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3219.486
Elevation (ft)
3745
3740
3735
3730
3725
3720
3715
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3000.000
Elevation (ft)
3735
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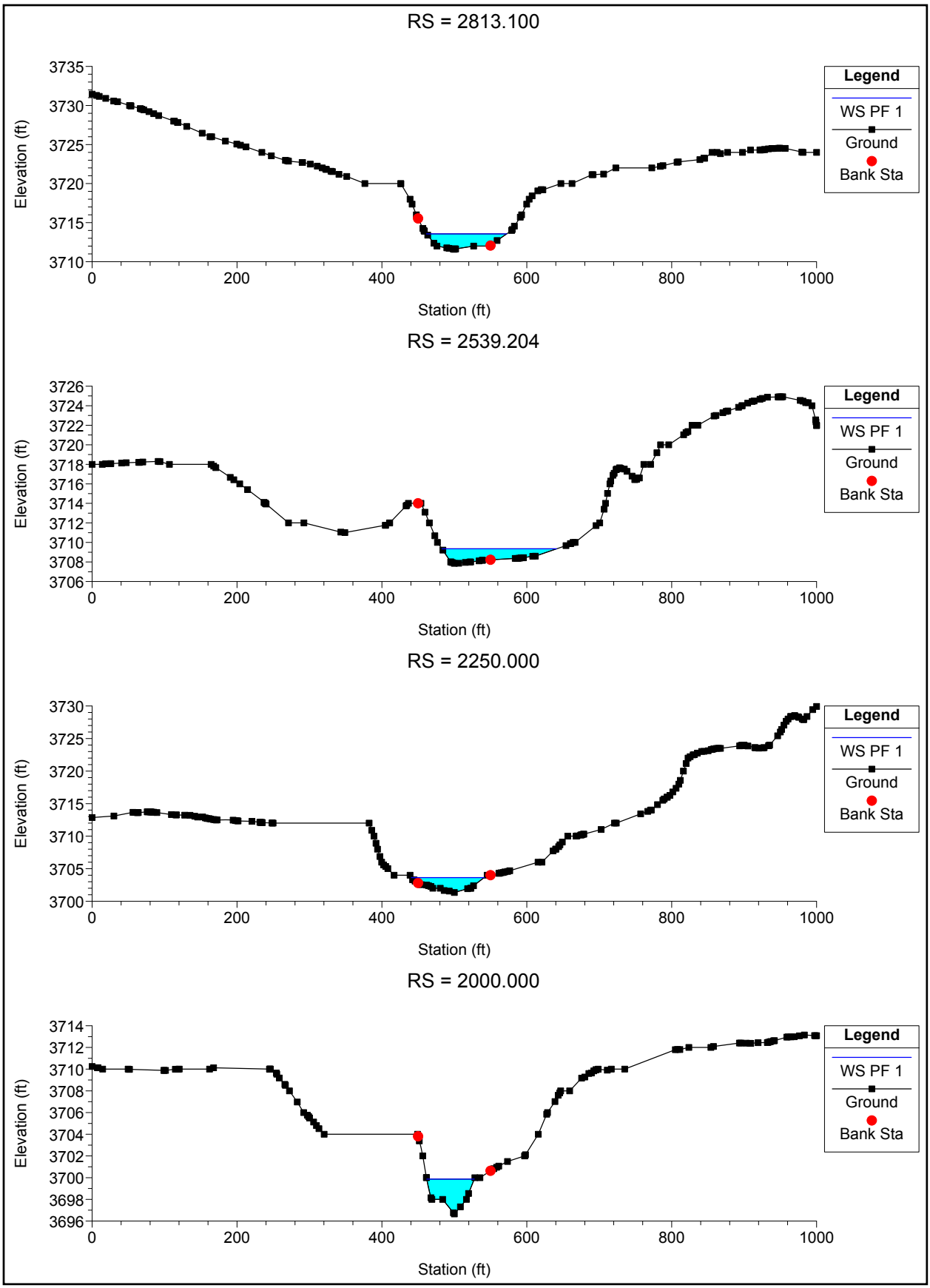
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2539.204
Elevation (ft)
3726
3724
3722
3720
3718
3716
3714
3712
3710
3708
3706
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3730
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
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3712
3710
3708
3706
3704
3702
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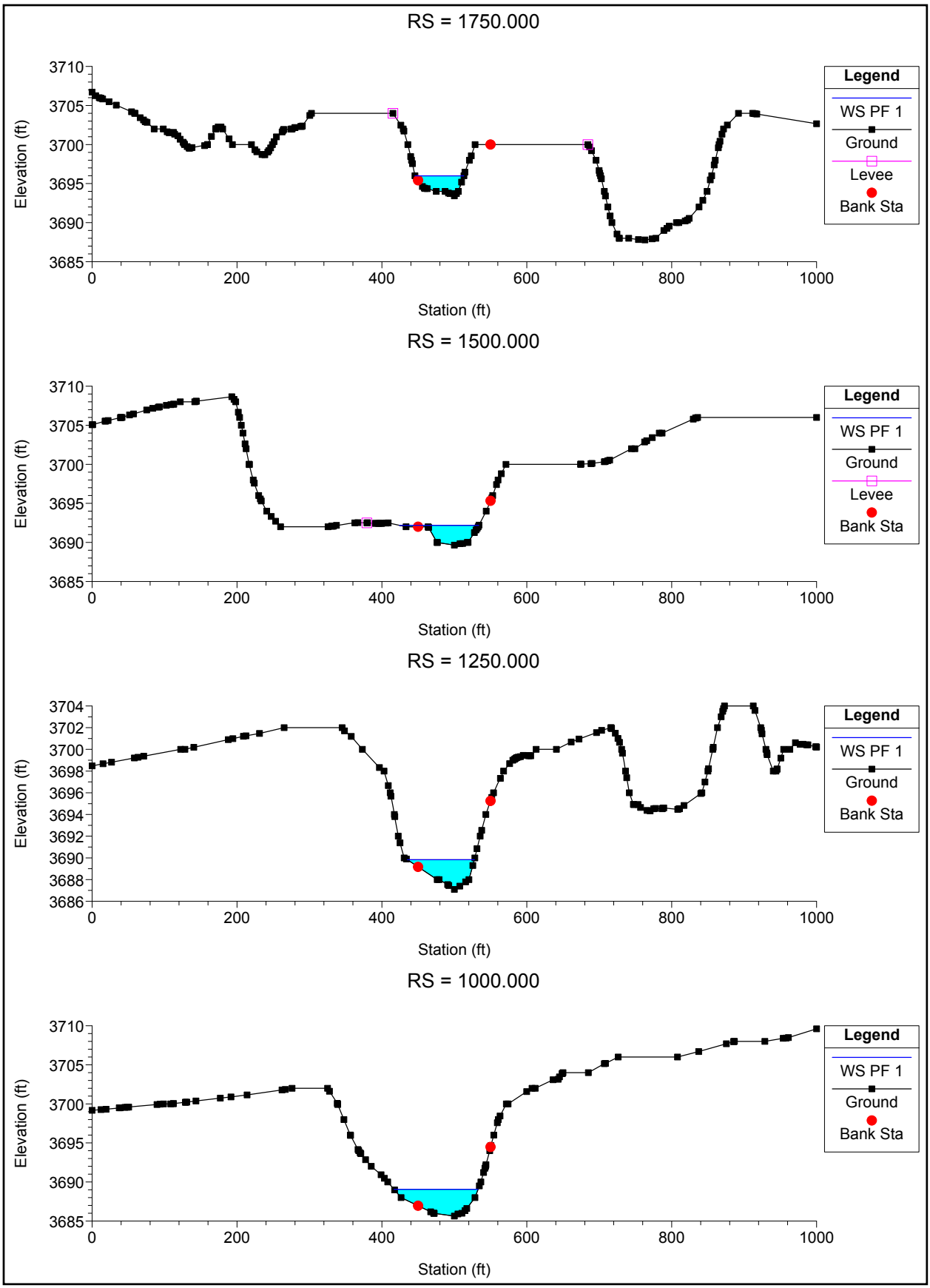
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1500.000
Elevation (ft)
3710
3705
3700
3695
3690
3685
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1250.000
Elevation (ft)
3704
3702
3700
3698
3696
3694
3692
3690
3688
3686
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3710
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3690
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400
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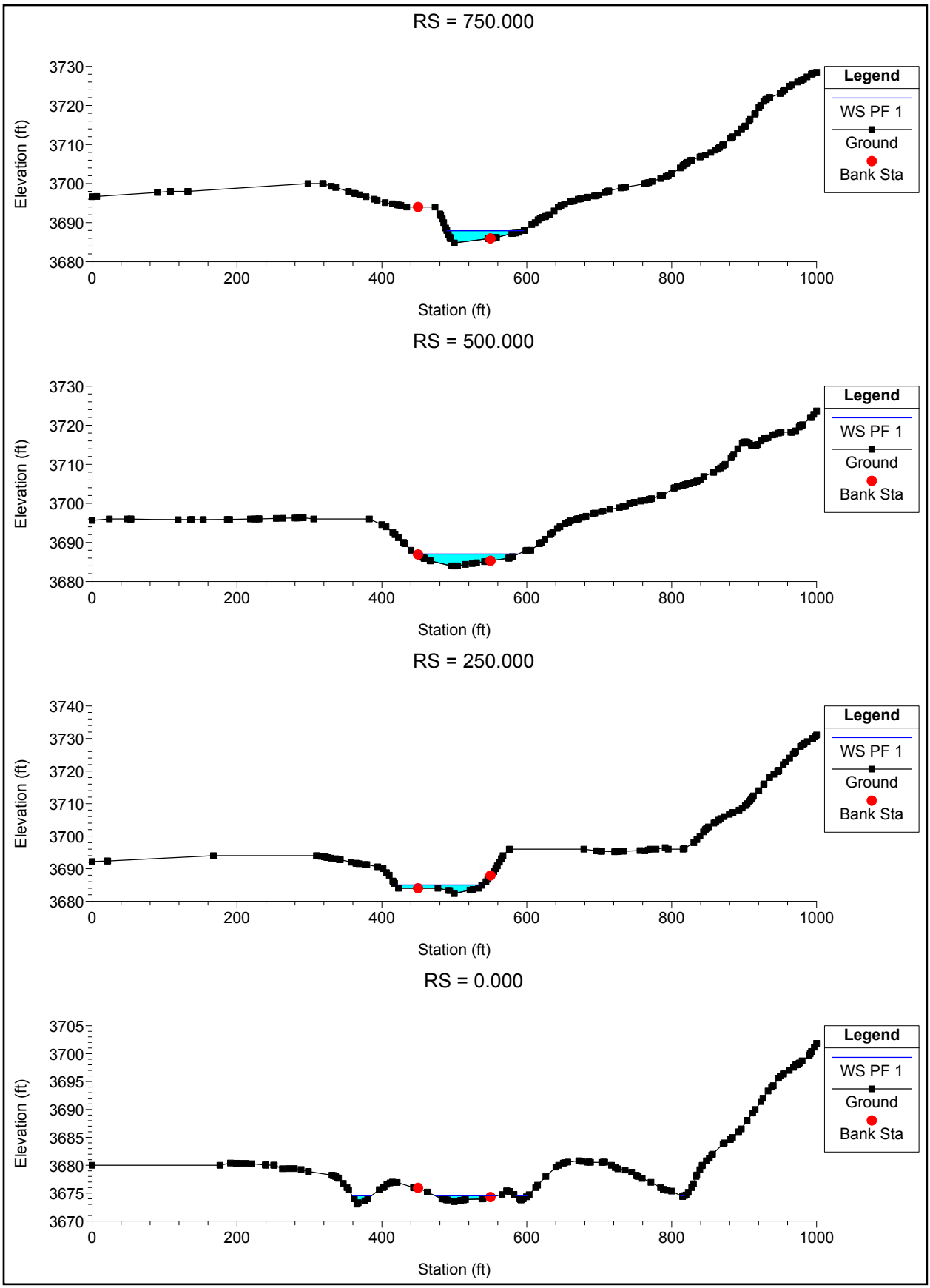
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3730
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3700
3690
3680
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3740
3730
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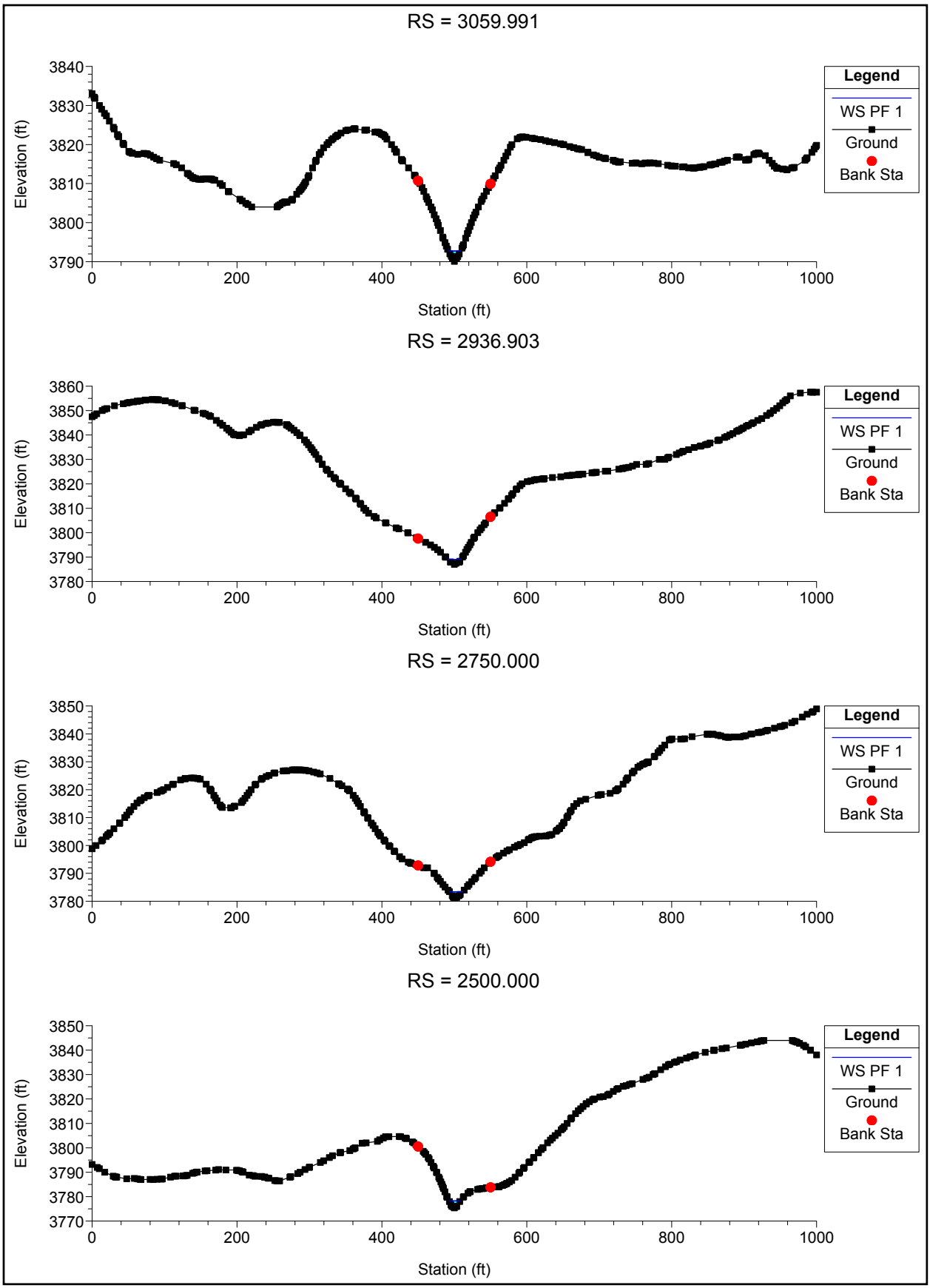
3710
3700
3690
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 0.000
Elevation (ft)
3705
3700
3695
3690
3685
3680
3675
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-10

# HEC-RAS Channel 07A

| 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) | |
| 07A | 3059.991 | PF 1 | 205 | 3790.08 | 3792.77 | 3793.04 | 3793.9 | 0.02671 | 8.52 | 24.07 | 16.84 | 1.26 |
| 07A | 2936.903 | PF 1 | 205 | 3787.05 | 3789.09 | 3789.48 | 3790.43 | 0.038441 | 9.26 | 22.13 | 18.3 | 1.48 |
| 07A | 2750 | PF 1 | 205 | 3781.17 | 3783.43 | 3783.7 | 3784.52 | 0.028061 | 8.4 | 24.41 | 18.38 | 1.28 |
| 07A | 2500 | PF 1 | 205 | 3775.39 | 3778.29 | 3778.32 | 3779.2 | 0.017711 | 7.69 | 26.67 | 15.57 | 1.03 |
| 07A | 2250 | PF 1 | 205 | 3770.6 | 3772.43 | 3772.79 | 3773.56 | 0.052992 | 8.89 | 25.31 | 37.77 | 1.67 |
| 07A | 2000 | PF 1 | 205 | 3759.88 | 3762.15 | 3762.53 | 3763.45 | 0.037292 | 9.14 | 22.44 | 18.48 | 1.46 |
| 07A | 1750 | PF 1 | 205 | 3745.42 | 3749.01 | 3748.23 | 3749.17 | 0.003288 | 3.17 | 64.6 | 42.24 | 0.45 |
| 07A | 1630.622 | PF 1 | 205 | 3744.66 | 3747.82 | 3747.82 | 3748.47 | 0.018262 | 6.44 | 31.84 | 25.71 | 1.02 |
| 07A | 1500 | PF 1 | 205 | 3743.24 | 3744.64 | 3744.82 | 3745.37 | 0.034325 | 6.86 | 29.86 | 36.48 | 1.34 |
| 07A | 1250 | PF 1 | 205 | 3737.51 | 3739.55 | 3739.55 | 3740.03 | 0.018938 | 5.57 | 36.82 | 39.33 | 1.01 |
| 07A | 1000 | PF 1 | 205 | 3734.25 | 3736.03 | 3735.29 | 3736.08 | 0.001723 | 1.89 | 108.3 | 97.17 | 0.32 |
| 07A | 923.905 | PF 1 | 205 | 3734 | 3735.32 | 3735.32 | 3735.75 | 0.019201 | 5.29 | 38.74 | 45.24 | 1.01 |
| 07A | 750 | PF 1 | 205 | 3729.1 | 3730.35 | 3730.59 | 3731.14 | 0.050921 | 7.1 | 28.86 | 45.13 | 1.57 |
| 07A | 500 | PF 1 | 205 | 3724.56 | 3725.79 | 3725.79 | 3726.13 | 0.019754 | 4.67 | 43.85 | 63.18 | 0.99 |
| 07A | 250 | PF 1 | 205 | 3720.17 | 3721.03 | 3721.05 | 3721.33 | 0.021385 | 4.56 | 47.43 | 89.16 | 1.01 |
| 07A | 0 | PF 1 | 205 | 3714.87 | 3715.64 | 3715.67 | 3715.9 | 0.023862 | 4.29 | 51.67 | 120.33 | 1.04 |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3790
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2936.903
Elevation (ft)
3860
3850
3840
3830
3820
3810
3800
3790
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2750.000
Elevation (ft)
3850
3840
3830
3820
3810
3800
3790
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2500.000
Elevation (ft)
3850
3840
3830
3820
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600
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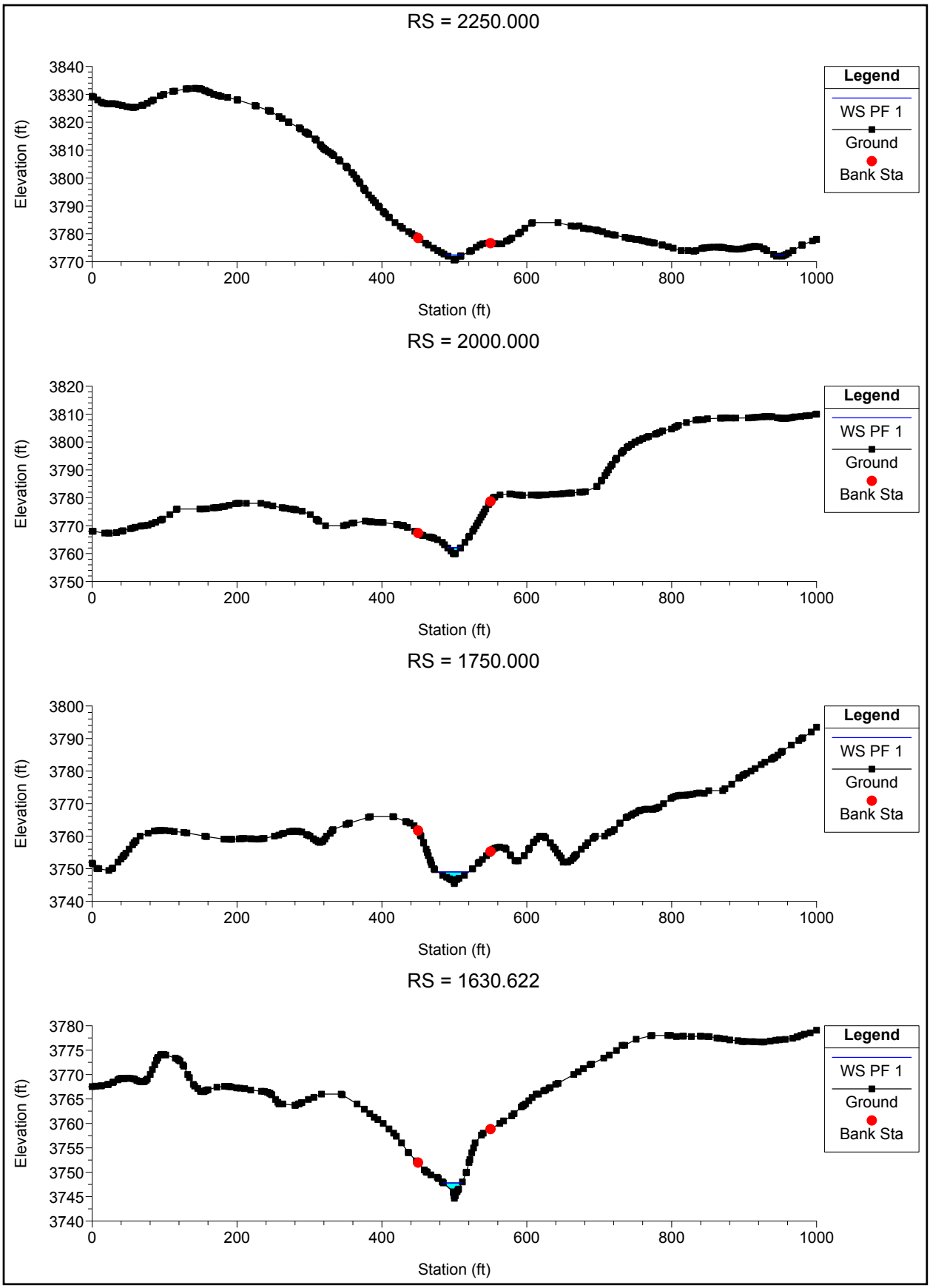
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
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3810
3800
3790
3780
3770
3760
3750
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
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3770
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3755
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Station (ft)
Legend
WS PF 1
Ground
Bank Sta

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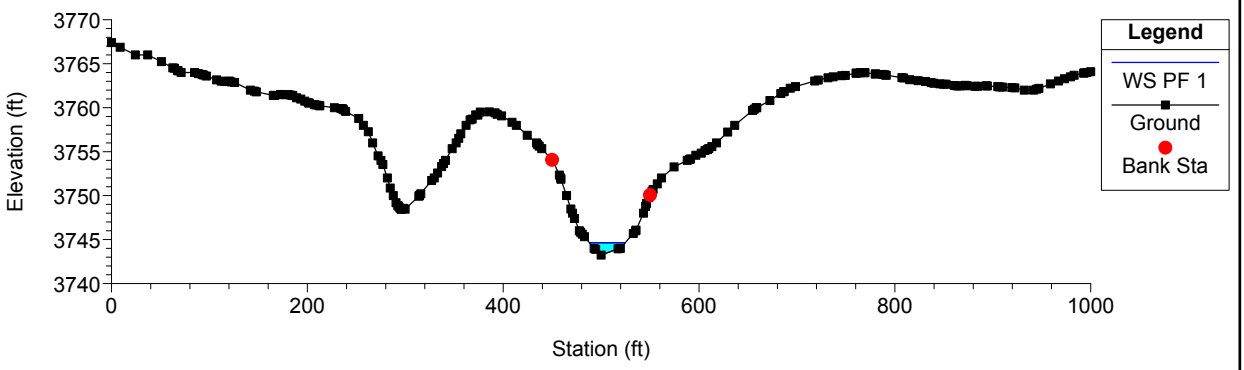


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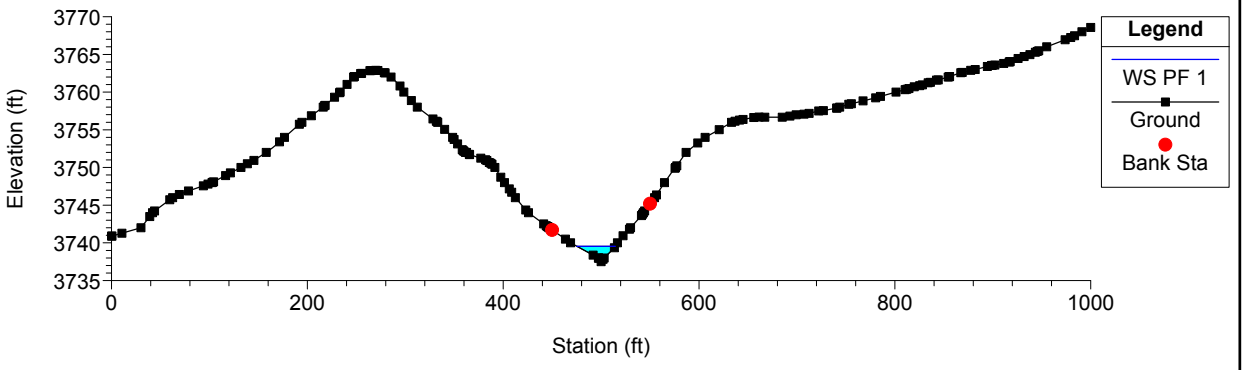


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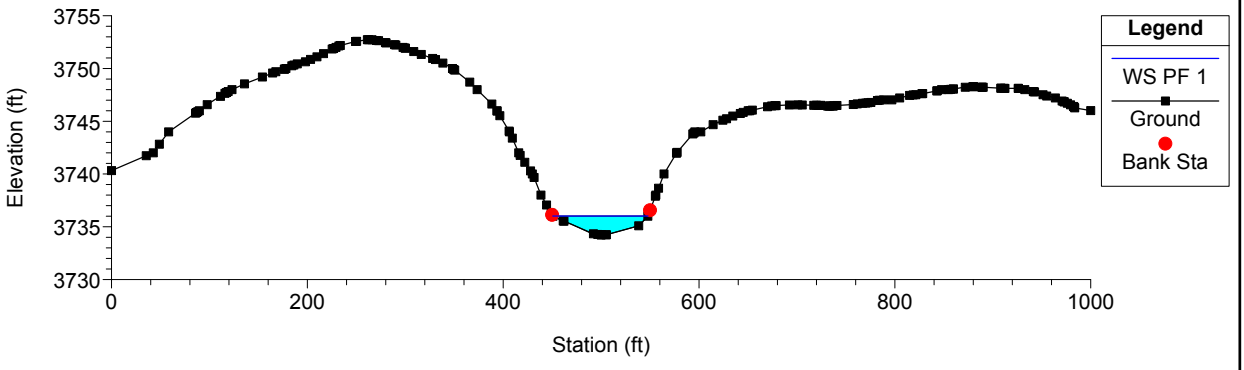


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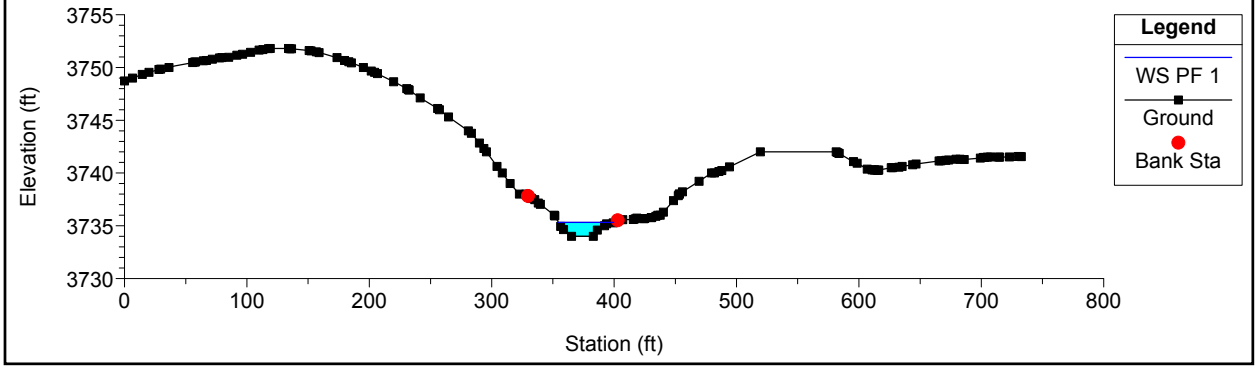

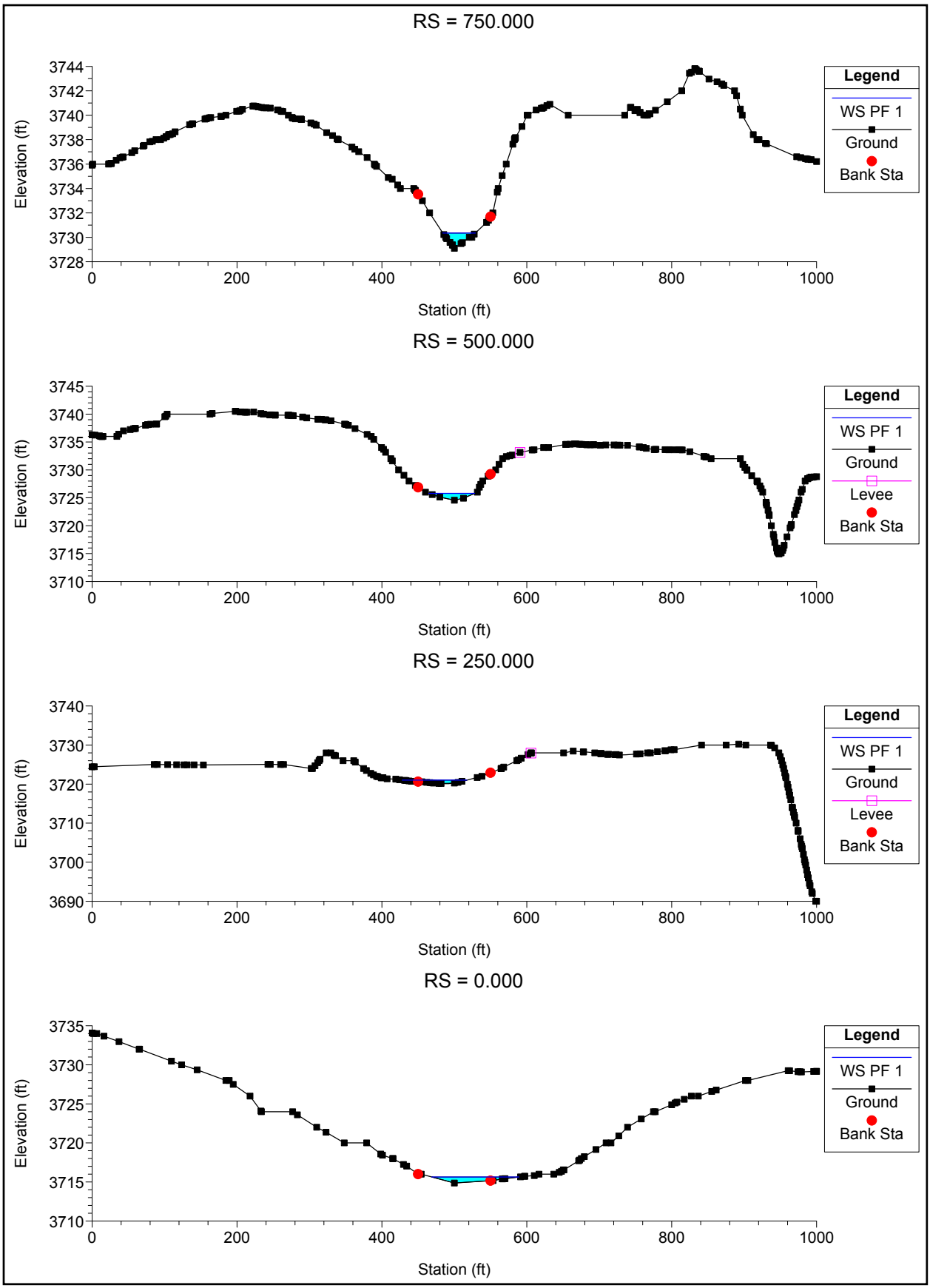
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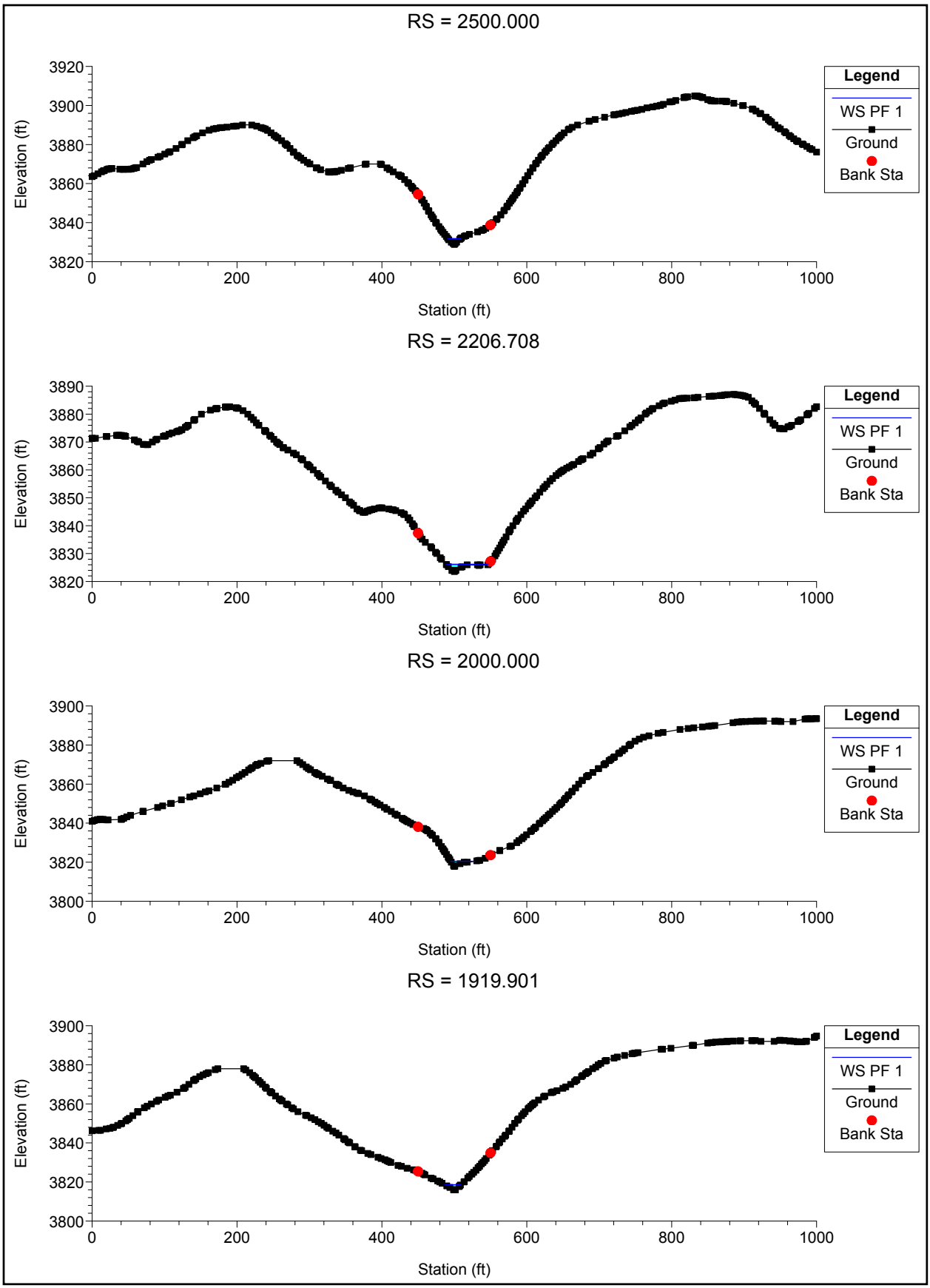
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3745
3740
3735
3730
3725
3720
3715
3710
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3740
3730
3720
3710
3700
3690
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3735
3730
3725
3720
3715
3710
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-11

# HEC-RAS Channel 07B

| 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) | |
| 07B | 2500 | PF 1 | 236 | 3828.85 | 3831.85 | 3832.1 | 3833.02 | 0.025009 | 8.68 | 27.19 | 17.48 | 1.23 |
| 07B | 2206.708 | PF 1 | 236 | 3823.55 | 3826.17 | 3826.21 | 3826.62 | 0.02415 | 5.42 | 43.57 | 58 | 1.1 |
| 07B | 2000 | PF 1 | 236 | 3817.92 | 3820.52 | 3820.7 | 3821.32 | 0.030202 | 7.19 | 32.81 | 33.22 | 1.28 |
| 07B | 1919.901 | PF 1 | 236 | 3815.94 | 3818.59 | 3818.69 | 3819.46 | 0.020161 | 7.47 | 31.59 | 22.17 | 1.1 |
| 07B | 1750 | PF 1 | 236 | 3811.98 | 3813.71 | 3814.1 | 3815.03 | 0.041184 | 9.22 | 25.58 | 22.69 | 1.53 |
| 07B | 1500 | PF 1 | 236 | 3802.44 | 3805.58 | 3805.88 | 3806.85 | 0.027454 | 9.03 | 26.13 | 16.73 | 1.27 |
| 07B | 1250 | PF 1 | 236 | 3793.73 | 3795.81 | 3796.42 | 3797.72 | 0.057737 | 11.1 | 21.27 | 18.21 | 1.81 |
| 07B | 1000 | PF 1 | 236 | 3789.53 | 3793.04 | 3792.84 | 3793.66 | 0.011862 | 6.31 | 37.39 | 22.34 | 0.86 |
| 07B | 750 | PF 1 | 236 | 3787.06 | 3789.96 | 3789.84 | 3790.52 | 0.013429 | 6.01 | 39.29 | 28.44 | 0.9 |
| 07B | 500 | PF 1 | 236 | 3783.58 | 3786.25 | 3786.25 | 3787.01 | 0.016618 | 6.98 | 33.81 | 22.77 | 1.01 |
| 07B | 250 | PF 1 | 236 | 3777.89 | 3780.33 | 3780.74 | 3781.66 | 0.033574 | 9.26 | 25.49 | 18.93 | 1.41 |
| 07B | 0 | PF 1 | 236 | 3776 | 3778.15 | 3778.14 | 3778.49 | 0.019996 | 4.69 | 50.33 | 71.94 | 0.99 |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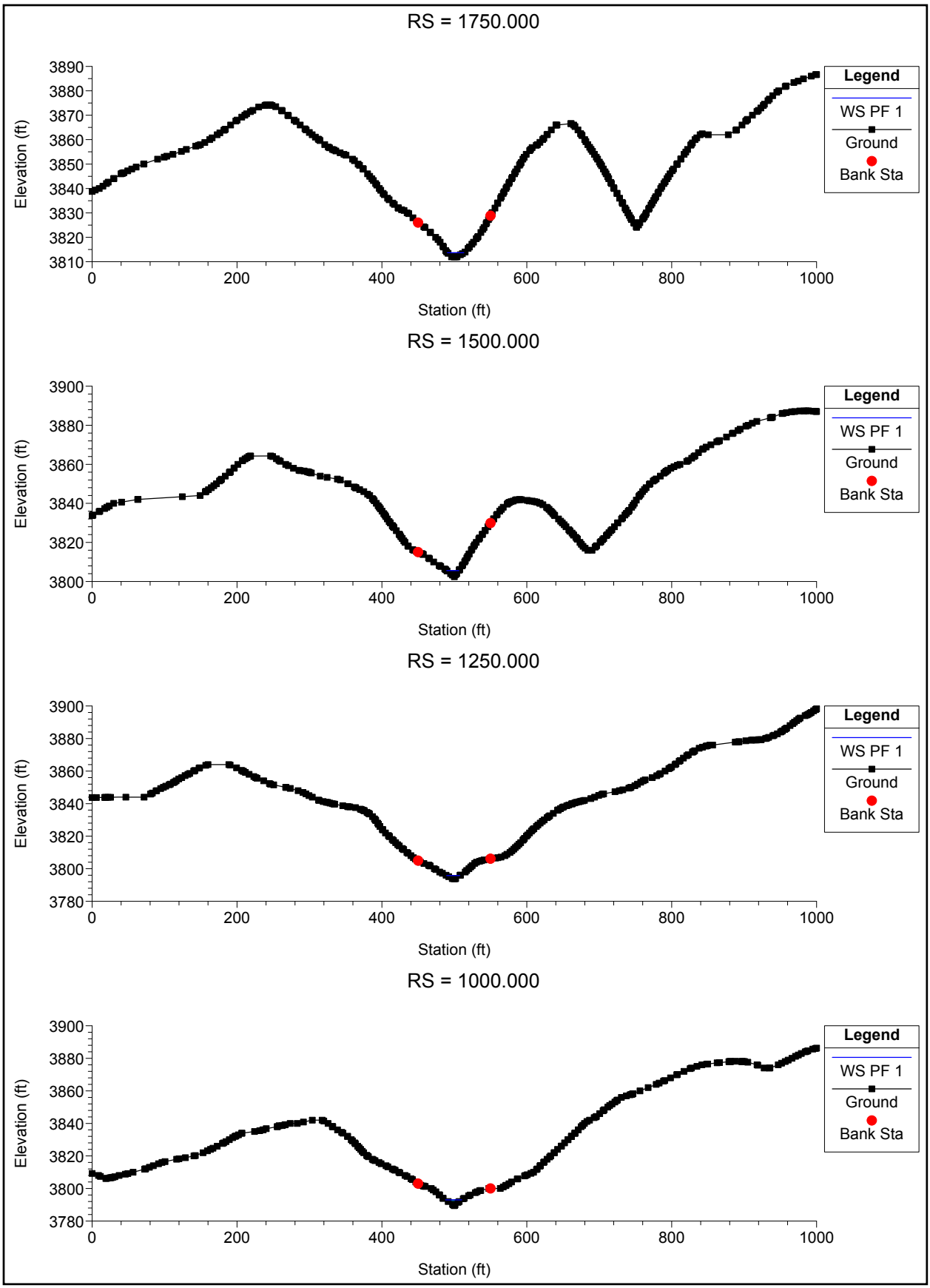
3920
3900
3880
3860
3840
3820
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2206.708
Elevation (ft)
3890
3880
3870
3860
3850
3840
3830
3820
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
3900
3880
3860
3840
3820
3800
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1919.901
Elevation (ft)
3900
3880
3860
3840
3820
3800
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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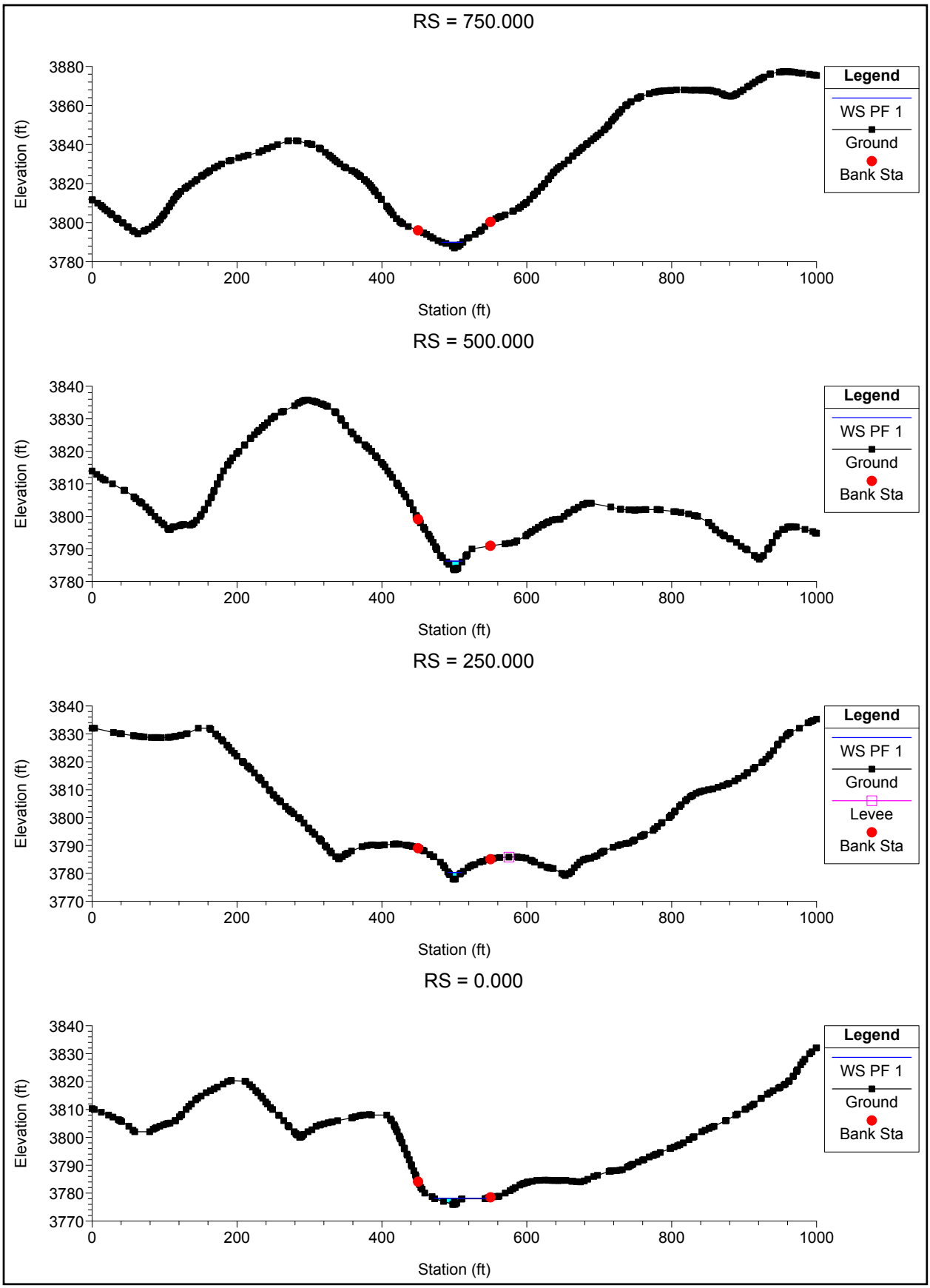
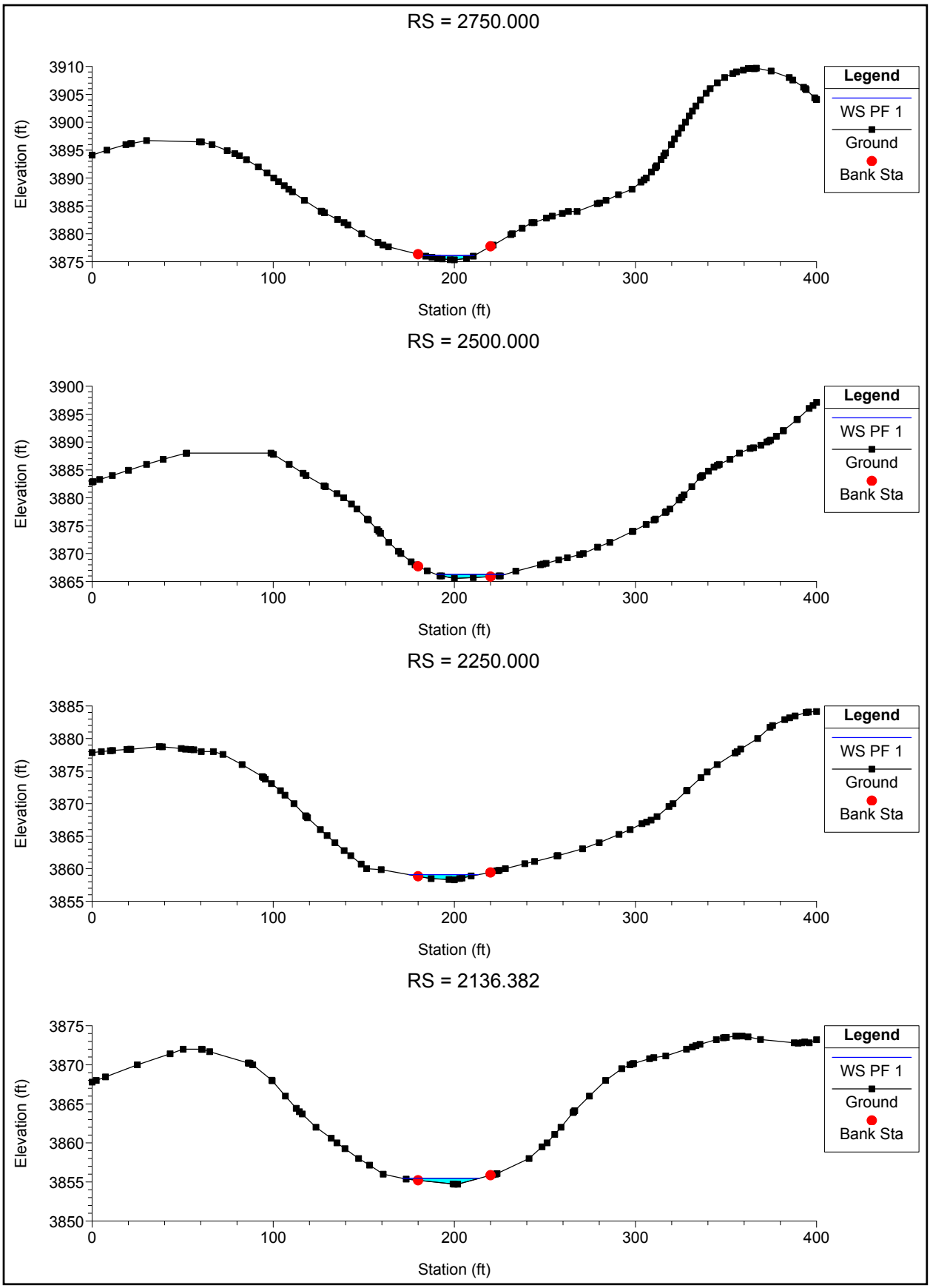
Elevation (ft)
3890
3880
3870
3860
3850
3840
3830
3820
3810
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
3900
3880
3860
3840
3820
3800
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
3900
3880
3860
3840
3820
3800
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3900
3880
3860
3840
3820
3800
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

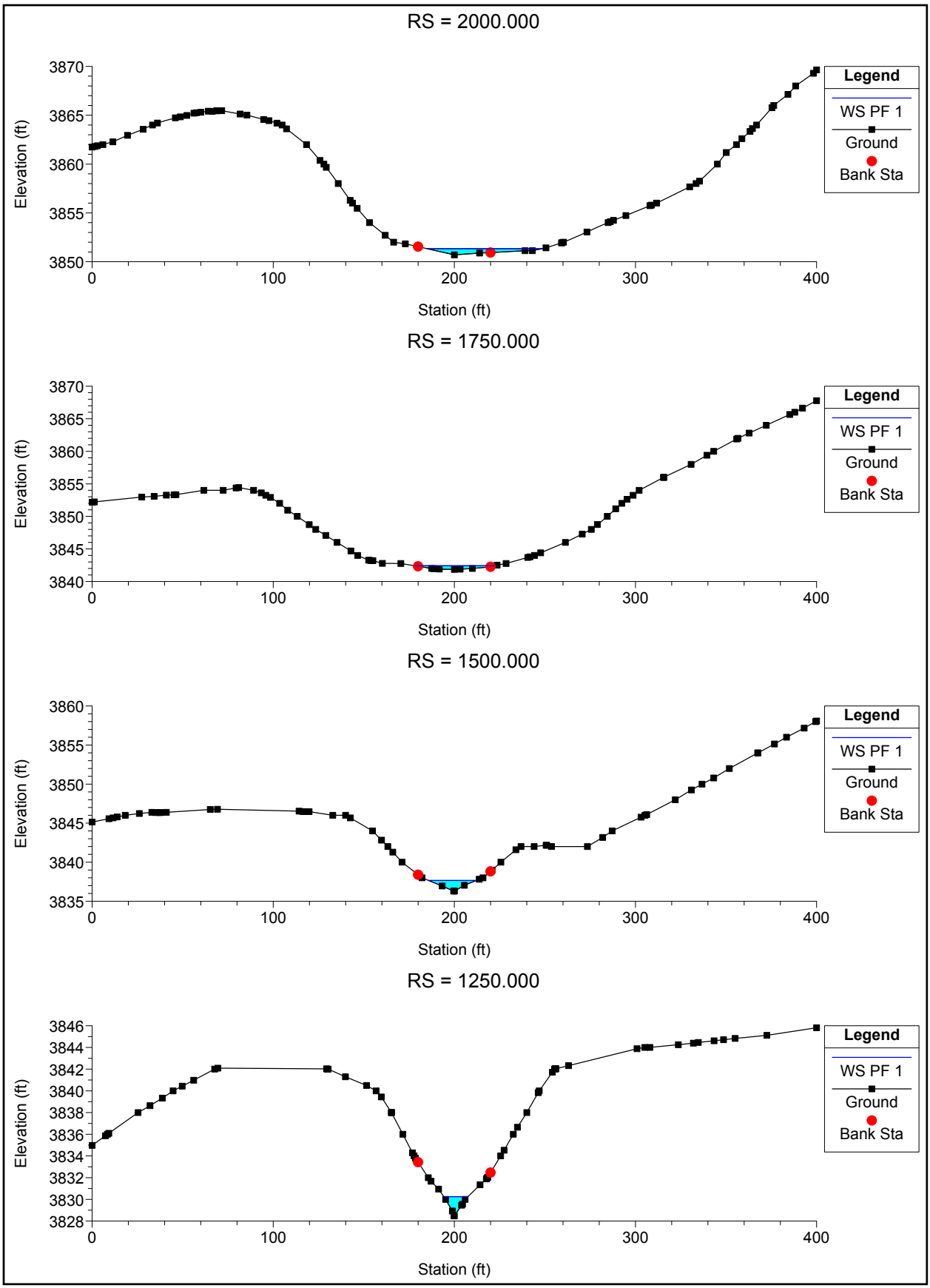

RS = 750.000
Elevation (ft)
3880
3860
3840
3820
3800
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
3780
3770
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
3780
3770
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

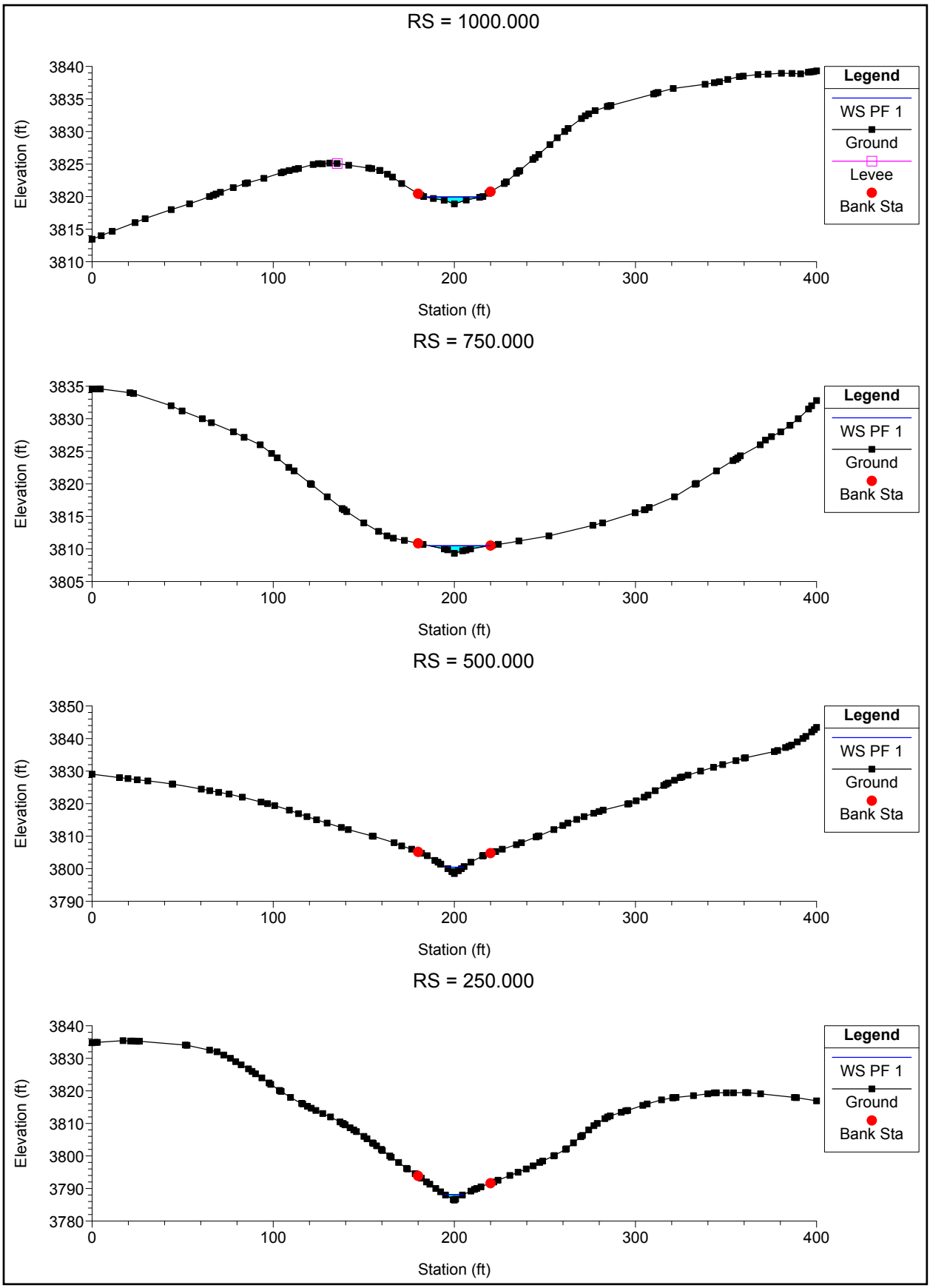
# Attachment 2.7-M-12

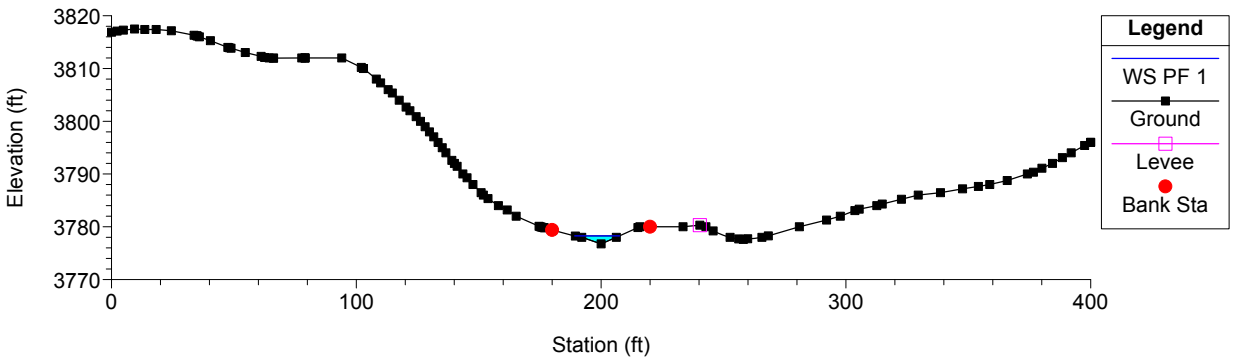
# HEC-RAS Channel 07C

| 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) | |
| 07C | 2750 | PF 1 | 81 | 3875.33 | 3876.1 | 3876.26 | 3876.65 | 0.051057 | 5.93 | 13.66 | 28.07 | 1.5 |
| 07C | 2500 | PF 1 | 81 | 3865.56 | 3866.26 | 3866.34 | 3866.62 | 0.033474 | 4.92 | 17.21 | 38.02 | 1.22 |
| 07C | 2250 | PF 1 | 81 | 3858.29 | 3859.09 | 3859.15 | 3859.42 | 0.029353 | 4.66 | 17.77 | 38.46 | 1.15 |
| 07C | 2136.382 | PF 1 | 81 | 3854.71 | 3855.47 | 3855.56 | 3855.83 | 0.036413 | 4.9 | 17.22 | 42.45 | 1.26 |
| 07C | 2000 | PF 1 | 81 | 3850.7 | 3851.33 | 3851.37 | 3851.56 | 0.029417 | 4.11 | 21.83 | 63.32 | 1.11 |
| 07C | 1750 | PF 1 | 81 | 3841.86 | 3842.41 | 3842.52 | 3842.81 | 0.049611 | 5.1 | 16.06 | 43.97 | 1.43 |
| 07C | 1500 | PF 1 | 81 | 3836.3 | 3837.67 | 3837.67 | 3838 | 0.021148 | 4.66 | 17.4 | 26.42 | 1.01 |
| 07C | 1250 | PF 1 | 81 | 3828.47 | 3830.25 | 3830.49 | 3831.05 | 0.037662 | 7.17 | 11.29 | 13.39 | 1.38 |
| 07C | 1000 | PF 1 | 81 | 3818.88 | 3819.96 | 3820.1 | 3820.45 | 0.048771 | 5.61 | 14.45 | 31.17 | 1.45 |
| 07C | 750 | PF 1 | 81 | 3809.33 | 3810.5 | 3810.57 | 3810.87 | 0.034379 | 4.88 | 16.59 | 33.87 | 1.23 |
| 07C | 500 | PF 1 | 81 | 3798.5 | 3800.49 | 3800.81 | 3801.55 | 0.042623 | 8.26 | 9.81 | 9.96 | 1.47 |
| 07C | 250 | PF 1 | 81 | 3786.44 | 3788.16 | 3788.58 | 3789.46 | 0.061866 | 9.16 | 8.84 | 10.38 | 1.75 |
| 07C | 0 | PF 1 | 81 | 3776.76 | 3778.29 | 3778.43 | 3778.85 | 0.030654 | 6 | 13.5 | 18.36 | 1.23 |


RS = 2750.000
Elevation (ft)
3910
3905
3900
3895
3890
3885
3880
3875
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2500.000
Elevation (ft)
3900
3895
3890
3885
3880
3875
3870
3865
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3885
3880
3875
3870
3865
3860
3855
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2136.382
Elevation (ft)
3875
3870
3865
3860
3855
3850
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 2000.000
Elevation (ft)
3870
3865
3860
3855
3850
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3870
3865
3860
3855
3850
3845
3840
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
3860
3855
3850
3845
3840
3835
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
3846
3844
3842
3840
3838
3836
3834
3832
3830
3828
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 1000.000
Elevation (ft)
3840
3835
3830
3825
3820
3815
3810
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3835
3830
3825
3820
3815
3810
3805
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3850
3840
3830
3820
3810
3800
3790
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
3780
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 0.000
Elevation (ft)
3820
3810
3800
3790
3780
3770
0
100
200
300
400
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-13

# HEC-RAS Channel 09

| 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) | |
| 9 | 19507.66 | PF 1 | 479 | 3799.17 | 3801.18 | 3801.47 | 3802.29 | 0.030016 | 8.44 | 56.73 | 45.9 | 1.34 |
| 9 | 19250 | PF 1 | 479 | 3794.28 | 3796.07 | 3796.09 | 3796.57 | 0.018825 | 5.68 | 84.81 | 95.72 | 1.02 |
| 9 | 19000 | PF 1 | 479 | 3785.96 | 3787.54 | 3788.07 | 3789.14 | 0.063803 | 10.15 | 47.21 | 51.18 | 1.86 |
| 9 | 18750 | PF 1 | 479 | 3778.22 | 3780.66 | 3780.72 | 3781.38 | 0.018494 | 6.84 | 70.07 | 54.14 | 1.06 |
| 9 | 18500 | PF 1 | 479 | 3774.03 | 3775.55 | 3775.64 | 3776.09 | 0.024668 | 6.13 | 83.74 | 110.87 | 1.15 |
| 9 | 18250 | PF 1 | 479 | 3764.91 | 3766.53 | 3766.93 | 3767.82 | 0.050512 | 9.13 | 52.48 | 55.95 | 1.66 |
| 9 | 18000 | PF 1 | 479 | 3760.74 | 3762.74 | 3762.74 | 3763.31 | 0.017416 | 6.07 | 78.95 | 69.93 | 1.01 |
| 9 | 17750 | PF 1 | 479 | 3756.77 | 3758.74 | 3758.79 | 3759.41 | 0.020116 | 6.61 | 72.49 | 62.91 | 1.08 |
| 9 | 17512.4 | PF 1 | 479 | 3753.77 | 3755.36 | 3755.36 | 3755.76 | 0.016396 | 5.13 | 97 | 131.58 | 0.94 |
| 9 | 17250 | PF 1 | 479 | 3748.18 | 3749.51 | 3749.68 | 3750.13 | 0.032695 | 6.71 | 80.56 | 133.72 | 1.31 |
| 9 | 17000 | PF 1 | 479 | 3744.5 | 3745.77 | 3745.73 | 3746.08 | 0.017266 | 4.55 | 107.46 | 150.53 | 0.93 |
| 9 | 16750 | PF 1 | 479 | 3740.38 | 3741.72 | 3741.72 | 3742.14 | 0.016727 | 5.43 | 95.11 | 113.53 | 0.96 |
| 9 | 16500 | PF 1 | 479 | 3737.21 | 3738.68 | 3738.56 | 3738.92 | 0.010497 | 4.14 | 125.45 | 163.71 | 0.76 |
| 9 | 16238.6 | PF 1 | 479 | 3733.87 | 3735.22 | 3735.22 | 3735.76 | 0.01721 | 5.94 | 82.6 | 79.37 | 1 |
| 9 | 16000 | PF 1 | 479 | 3729.18 | 3731.13 | 3731.16 | 3731.8 | 0.017504 | 6.6 | 72.53 | 56.87 | 1.03 |
| 9 | 15750 | PF 1 | 479 | 3725.62 | 3728.12 | 3727.72 | 3728.39 | 0.006331 | 4.28 | 116.48 | 90.84 | 0.63 |
| 9 | 15449.96 | PF 1 | 479 | 3723.16 | 3725.81 | 3725.81 | 3726.47 | 0.016611 | 6.54 | 73.27 | 55.78 | 1.01 |
| 9 | 15250 | PF 1 | 479 | 3721.15 | 3723.17 | 3723.05 | 3723.69 | 0.01279 | 5.77 | 83.02 | 62.81 | 0.88 |
| 9 | 15000 | PF 1 | 479 | 3718 | 3721.01 | 3720.55 | 3721.36 | 0.007074 | 4.76 | 100.56 | 64.29 | 0.67 |
| 9 | 14750 | PF 1 | 479 | 3718 | 3719.31 | 3719.31 | 3719.47 | 0.010586 | 3.55 | 154.28 | 268.78 | 0.73 |
| 9 | 14500 | PF 1 | 479 | 3714 | 3715.44 | 3715.59 | 3716.15 | 0.028594 | 6.75 | 70.93 | 76.63 | 1.24 |
| 9 | 14250 | PF 1 | 479 | 3712 | 3713.98 | 3712.81 | 3714 | 0.000476 | 1.25 | 436.48 | 349.59 | 0.18 |
| 9 | 14162.7 | PF 1 | 479 | 3712 | 3713.43 | 3713.43 | 3713.84 | 0.015416 | 5.52 | 97.3 | 116.3 | 0.93 |
| 9 | 14066.2 | PF 1 | 479 | 3703.98 | 3705.14 | 3706.19 | 3709.79 | 0.197319 | 17.3 | 27.69 | 31.35 | 3.24 |
| 9 | 14000 | PF 1 | 479 | 3703.43 | 3706.52 | 3705.67 | 3706.83 | 0.004203 | 4.51 | 106.29 | 50.15 | 0.55 |
| 9 | 13750 | PF 1 | 479 | 3701.26 | 3704.51 | 3704.44 | 3705.21 | 0.014022 | 6.69 | 71.64 | 46.23 | 0.95 |
| 9 | 13470.66 | PF 1 | 479 | 3699.16 | 3702.19 | 3701.79 | 3702.53 | 0.010069 | 4.74 | 101.14 | 86 | 0.77 |
| 9 | 13250 | PF 1 | 943 | 3701 | 3700.58 | 3700.26 | 3700.81 | 0.007338 | | 246.31 | 227.74 | 0 |
| 9 | 13048.33 | PF 1 | 943 | 3699.08 | 3699.18 | 3698.82 | 3699.41 | 0.006727 | 0.48 | 242.11 | 212.58 | 0.37 |
| 9 | 12500 | PF 1 | 943 | 3693.64 | 3694.64 | 3694.54 | 3694.92 | 0.013241 | 3.71 | 225.76 | 287.39 | 0.8 |
| 9 | 12250 | PF 1 | 943 | 3690 | 3690.94 | 3690.94 | 3691.23 | 0.016622 | 4.78 | 231.59 | 394.15 | 0.93 |
| 9 | 12034.36 | PF 1 | 943 | 3688.02 | 3689.56 | 3688.75 | 3689.6 | 0.001028 | 1.68 | 613.16 | 519.45 | 0.25 |
| 9 | 11875.18 | PF 1 | 943 | 3688 | 3688.83 | 3688.83 | 3689.15 | 0.018223 | 3.62 | 212.07 | 320.66 | 0.9 |
| 9 | 11804.22 | PF 1 | 943 | 3681.97 | 3683.5 | 3684.32 | 3686.25 | 0.11928 | 13.61 | 73.66 | 100.9 | 2.53 |
| 9 | 11750 | PF 1 | 943 | 3681.08 | 3683.76 | 3683.76 | 3684.33 | 0.011328 | 6.32 | 167.91 | 147.91 | 0.87 |
| 9 | 11481.11 | PF 1 | 943 | 3677.2 | 3680.55 | 3680.6 | 3681.06 | 0.015008 | 6.14 | 178.29 | 209.32 | 0.95 |
| 9 | 11250 | PF 1 | 943 | 3671.84 | 3676.95 | 3676.77 | 3677.91 | 0.0114 | 7.84 | 120.22 | 51.55 | 0.91 |
| 9 | 10972.12 | PF 1 | 943 | 3668.34 | 3674.72 | 3674.53 | 3675.34 | 0.009187 | 6.48 | 154.37 | 94.01 | 0.79 |
| 9 | 10750 | PF 1 | 943 | 3666.52 | 3672.74 | | 3673.26 | 0.009927 | 5.79 | 164.18 | 115.03 | 0.8 |
| 9 | 10500 | PF 1 | 943 | 3664.92 | 3670.89 | | 3671.19 | 0.006733 | 4.81 | 228.79 | 197.78 | 0.66 |
| 9 | 10250 | PF 1 | 943 | 3663.39 | 3668.94 | | 3669.45 | 0.008039 | 5.86 | 171.38 | 123.04 | 0.74 |
| 9 | 10000 | PF 1 | 943 | 3661.76 | 3666.76 | 3666.51 | 3667.33 | 0.010197 | 6.07 | 156.78 | 105.96 | 0.82 |
| 9 | 9750 | PF 1 | 943 | 3659.95 | 3665.17 | 3665.17 | 3665.68 | 0.00958 | 6 | 183.89 | 200.92 | 0.8 |
| 9 | 9500 | PF 1 | 943 | 3657.97 | 3662.58 | 3662.6 | 3662.95 | 0.013835 | 5.5 | 211.93 | 295.79 | 0.9 |
| 9 | 9250 | PF 1 | 943 | 3656.4 | 3660.46 | 3660.36 | 3660.55 | 0.003782 | 2.85 | 417.8 | 536.34 | 0.47 |

| 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) | |
| 9 | 9000 | PF 1 | 943 | 3653.98 | 3657.72 | 3657.72 | 3658.87 | 0.014158 | 8.62 | 109.45 | 48.44 | 1.01 |
| 9 | 8750 | PF 1 | 943 | 3651.79 | 3656.09 | 3656.16 | 3656.44 | 0.005997 | 6.85 | 295.61 | 467.83 | 0.68 |
| 9 | 8500 | PF 1 | 943 | 3650.32 | 3653.14 | 3653.14 | 3653.34 | 0.007315 | 4.24 | 284.25 | 367.89 | 0.66 |
| 9 | 8277.232 | PF 1 | 943 | 3650 | 3652.17 | 3651.41 | 3652.21 | 0.00143 | 1.87 | 573.88 | 564.84 | 0.29 |
| 9 | 8000 | PF 1 | 1463 | 3648 | 3650.79 | 3650.79 | 3651.19 | 0.016797 | 5.86 | 299.89 | 375.38 | 0.98 |
| 9 | 7787.415 | PF 1 | 1463 | 3647.19 | 3649.6 | 3649.6 | 3649.66 | 0.001844 | 2 | 732.63 | 652.48 | 0.32 |
| 9 | 7500 | PF 1 | 1463 | 3644.23 | 3646.57 | 3646.97 | 3648.01 | 0.123164 | 9.89 | 152.81 | 303.1 | 2.36 |
| 9 | 7221.018 | PF 1 | 1463 | 3641.5 | 3646.36 | 3645.86 | 3646.53 | 0.00402 | 3.86 | 515.29 | 684.94 | 0.52 |
| 9 | 7000 | PF 1 | 1463 | 3640.53 | 3644.77 | 3644.77 | 3645.15 | 0.014517 | 5.81 | 310.01 | 370.74 | 0.93 |
| 9 | 6750 | PF 1 | 1463 | 3639.11 | 3643.22 | 3643.15 | 3643.38 | 0.005972 | 3.88 | 486.38 | 607.01 | 0.6 |
| 9 | 6401.949 | PF 1 | 1463 | 3637.05 | 3641.93 | 3641.43 | 3642.26 | 0.00571 | 4.77 | 322.46 | 204.1 | 0.62 |
| 9 | 6250 | PF 1 | 1463 | 3636.26 | 3640.62 | 3640.62 | 3640.91 | 0.016215 | 5.4 | 355.39 | 564.41 | 0.95 |
| 9 | 6000 | PF 1 | 1463 | 3635.5 | 3639.69 | 3638.88 | 3639.77 | 0.001809 | 2.81 | 669.46 | 514.67 | 0.35 |
| 9 | 5672.625 | PF 1 | 1463 | 3634 | 3638.35 | 3638.3 | 3638.92 | 0.009096 | 6.38 | 264.57 | 230.73 | 0.8 |
| 9 | 5500 | PF 1 | 1463 | 3634 | 3636.76 | 3636.74 | 3637.13 | 0.014182 | 5.61 | 313.98 | 372.91 | 0.91 |
| 9 | 5250 | PF 1 | 1463 | 3632 | 3635.22 | | 3635.36 | 0.004094 | 3.43 | 505.37 | 473.35 | 0.5 |
| 9 | 5037.191 | PF 1 | 1463 | 3632 | 3634.42 | 3633.98 | 3634.6 | 0.003643 | 4.07 | 483.83 | 463.12 | 0.51 |
| 9 | 4750 | PF 1 | 1795 | 3629.75 | 3632.32 | 3632.32 | 3632.88 | 0.0134 | 6.73 | 313.62 | 271.55 | 0.94 |
| 9 | 4422.17 | PF 1 | 1795 | 3627.86 | 3629.89 | 3629.42 | 3630.16 | 0.004983 | 4.39 | 449.72 | 321.14 | 0.58 |
| 9 | 4208.772 | PF 1 | 1795 | 3627.29 | 3629.18 | | 3629.29 | 0.003232 | 3.1 | 669.38 | 578.17 | 0.45 |
| 9 | 3764.471 | PF 1 | 1795 | 3626 | 3628.09 | | 3628.35 | 0.005108 | 4.14 | 440.85 | 315.68 | 0.58 |
| 9 | 3519.649 | PF 1 | 1795 | 3623.09 | 3627.12 | | 3627.48 | 0.004041 | 5.24 | 407.47 | 232.97 | 0.56 |
| 9 | 3250 | PF 1 | 1795 | 3621.37 | 3625.1 | 3625.1 | 3625.88 | 0.013092 | 7.51 | 264.98 | 175.15 | 0.95 |
| 9 | 3044.341 | PF 1 | 1795 | 3616.45 | 3622.69 | 3622.72 | 3623.55 | 0.012145 | 8.04 | 257.6 | 159.61 | 0.94 |
| 9 | 2750 | PF 1 | 1795 | 3614 | 3620.6 | 3620.62 | 3621.22 | 0.008703 | 6.75 | 323.42 | 267.77 | 0.79 |
| 9 | 2534.643 | PF 1 | 1795 | 3612 | 3616.72 | 3617.19 | 3618.56 | 0.021353 | 11.01 | 169.62 | 82.26 | 1.25 |
| 9 | 2250 | PF 1 | 1795 | 3612 | 3616.33 | 3615.85 | 3616.44 | 0.001355 | 2.63 | 667.05 | 293.96 | 0.31 |
| 9 | 1933.837 | PF 1 | 1795 | 3610 | 3615.68 | 3614.69 | 3615.95 | 0.002455 | 4.51 | 466.6 | 243.88 | 0.45 |
| 9 | 1750 | PF 1 | 1795 | 3609.69 | 3614.09 | 3614.09 | 3615.14 | 0.012652 | 8.28 | 222.7 | 105.54 | 0.96 |
| 9 | 1500 | PF 1 | 1795 | 3608 | 3614.58 | 3613.18 | 3614.59 | 0.00007 | 0.89 | 2046.95 | 516.44 | 0.08 |
| 9 | 1250 | PF 1 | 2402 | 3605.41 | 3612.7 | 3612.7 | 3614.36 | 0.011193 | 10.34 | 235.54 | 76.27 | 0.96 |
| 9 | 1067.803 | PF 1 | 2402 | 3604.82 | 3612.74 | 3610.99 | 3612.77 | 0.000188 | 1.49 | 1928.8 | 626.29 | 0.13 |
| 9 | 750 | PF 1 | 2402 | 3603.62 | 3611.6 | 3611.13 | 3612.56 | 0.007401 | 7.92 | 310.66 | 106.69 | 0.77 |
| 9 | 500 | PF 1 | 2402 | 3602.01 | 3609.29 | 3609.27 | 3610.35 | 0.010808 | 8.44 | 304.3 | 157.66 | 0.91 |
| 9 | 250 | PF 1 | 2402 | 3602 | 3607.16 | 3607.16 | 3607.69 | 0.011102 | 7.33 | 443.68 | 363.2 | 0.88 |
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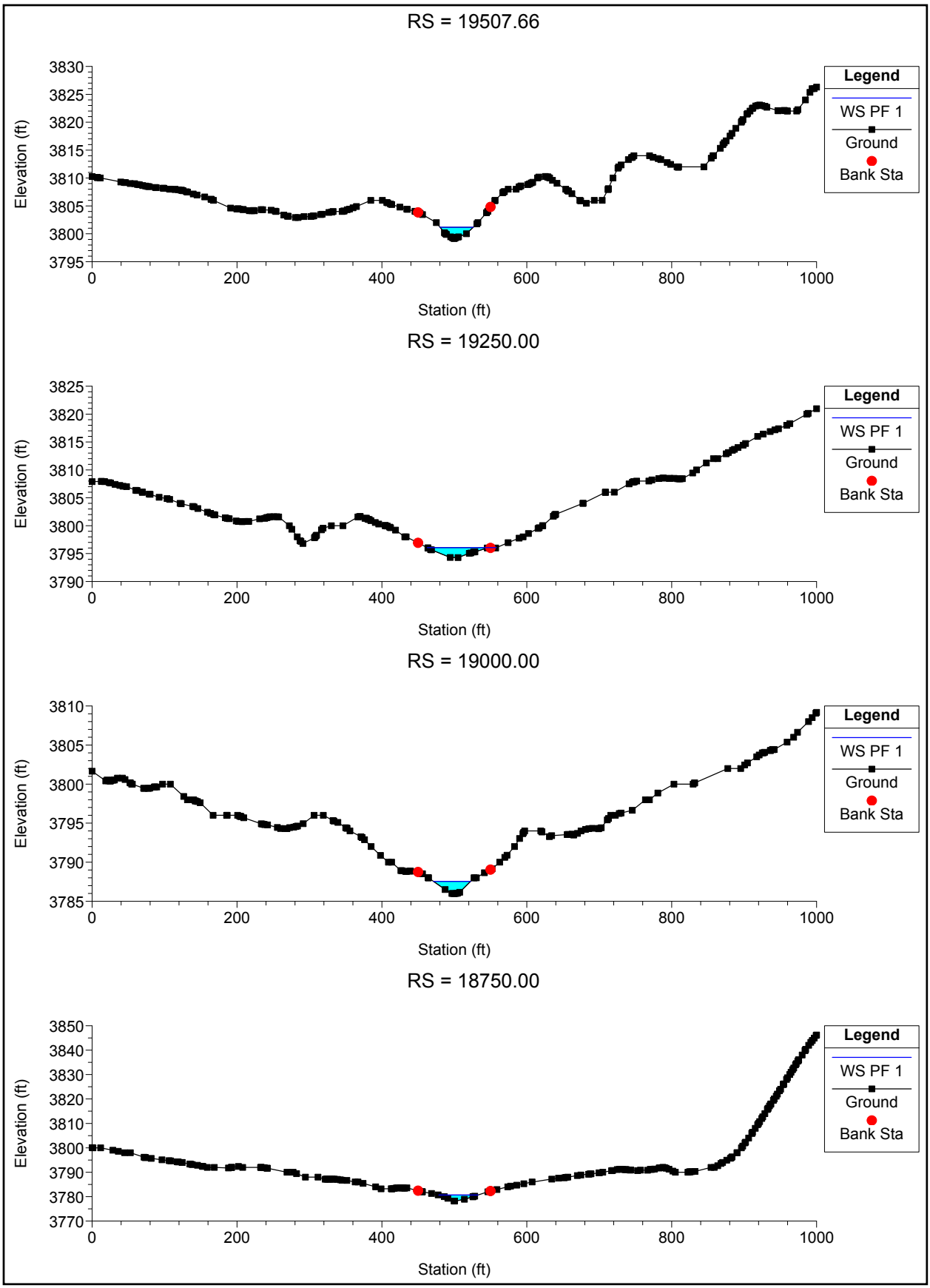
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3815
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3805
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3795
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 19250.00
Elevation (ft)
3825
3820
3815
3810
3805
3800
3795
3790
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 19000.00
Elevation (ft)
3810
3805
3800
3795
3790
3785
0
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
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3830
3820
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600
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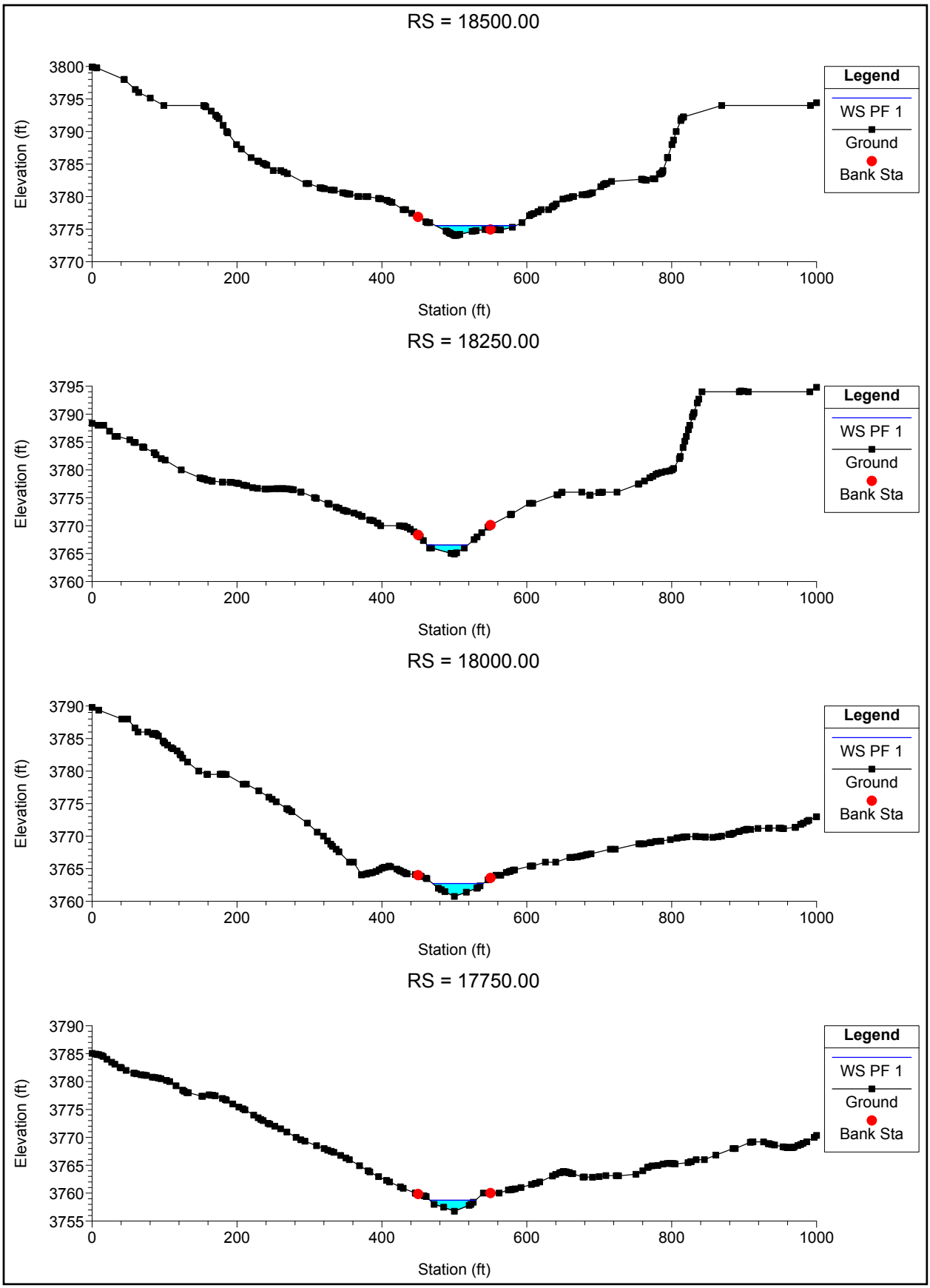
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 18250.00
Elevation (ft)
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3790
3785
3780
3775
3770
3765
3760
0
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 18000.00
Elevation (ft)
3790
3785
3780
3775
3770
3765
3760
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 17750.00
Elevation (ft)
3790
3785
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Station (ft)
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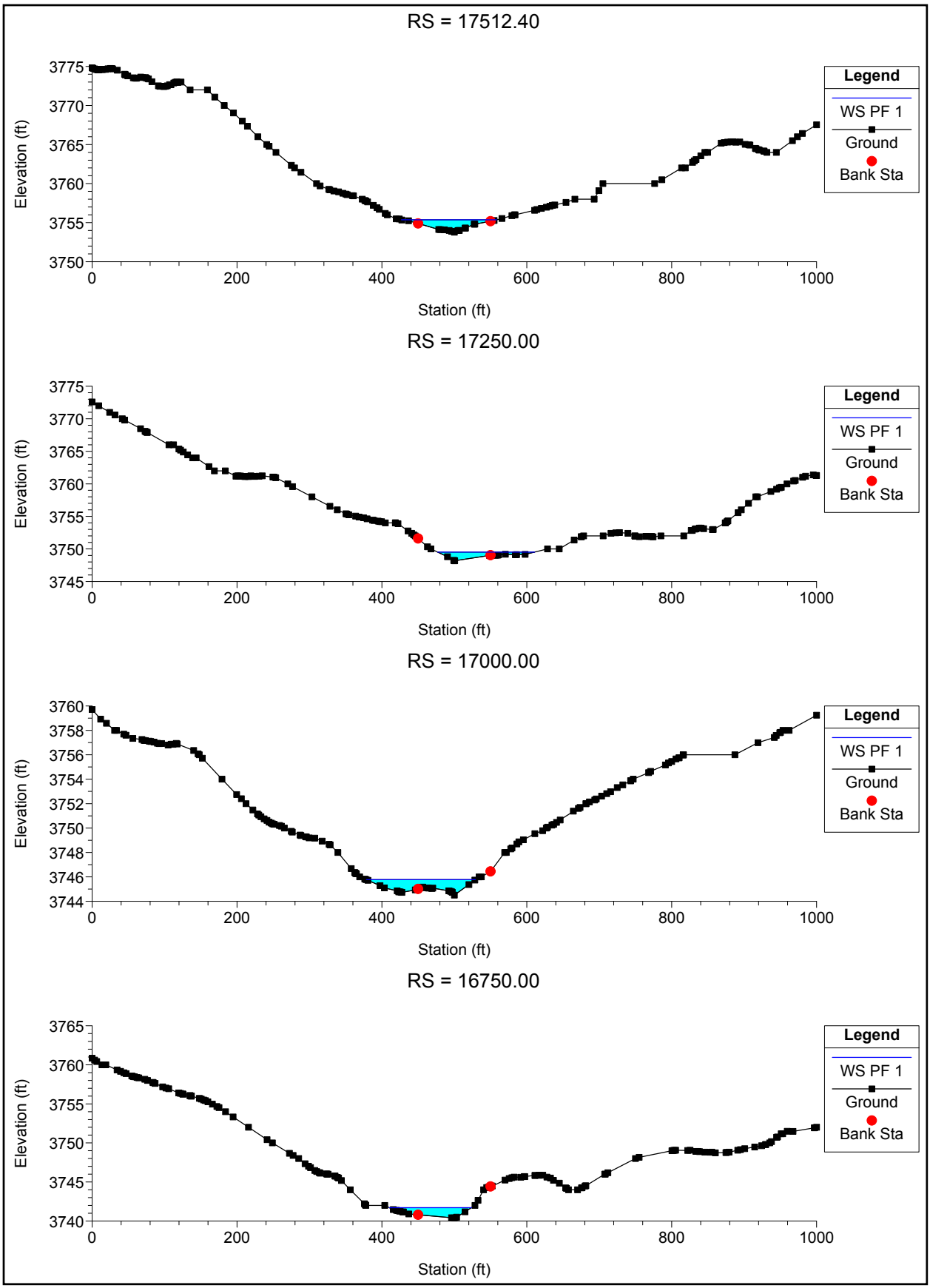
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 17250.00
Elevation (ft)
3775
3770
3765
3760
3755
3750
3745
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 17000.00
Elevation (ft)
3760
3758
3756
3754
3752
3750
3748
3746
3744
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 16750.00
Elevation (ft)
3765
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3745
3740
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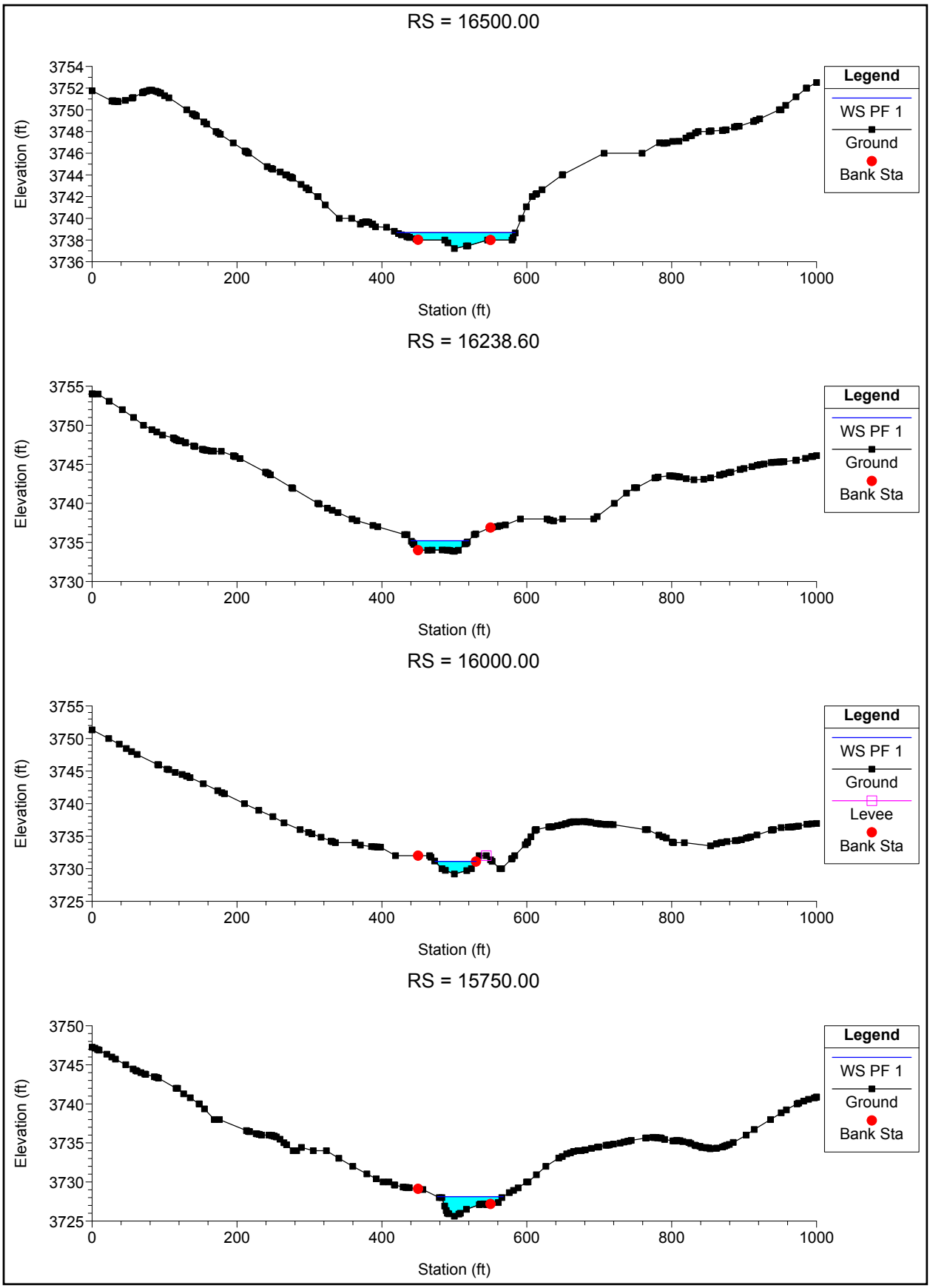
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 16000.00
Elevation (ft)
Station (ft)
Legend
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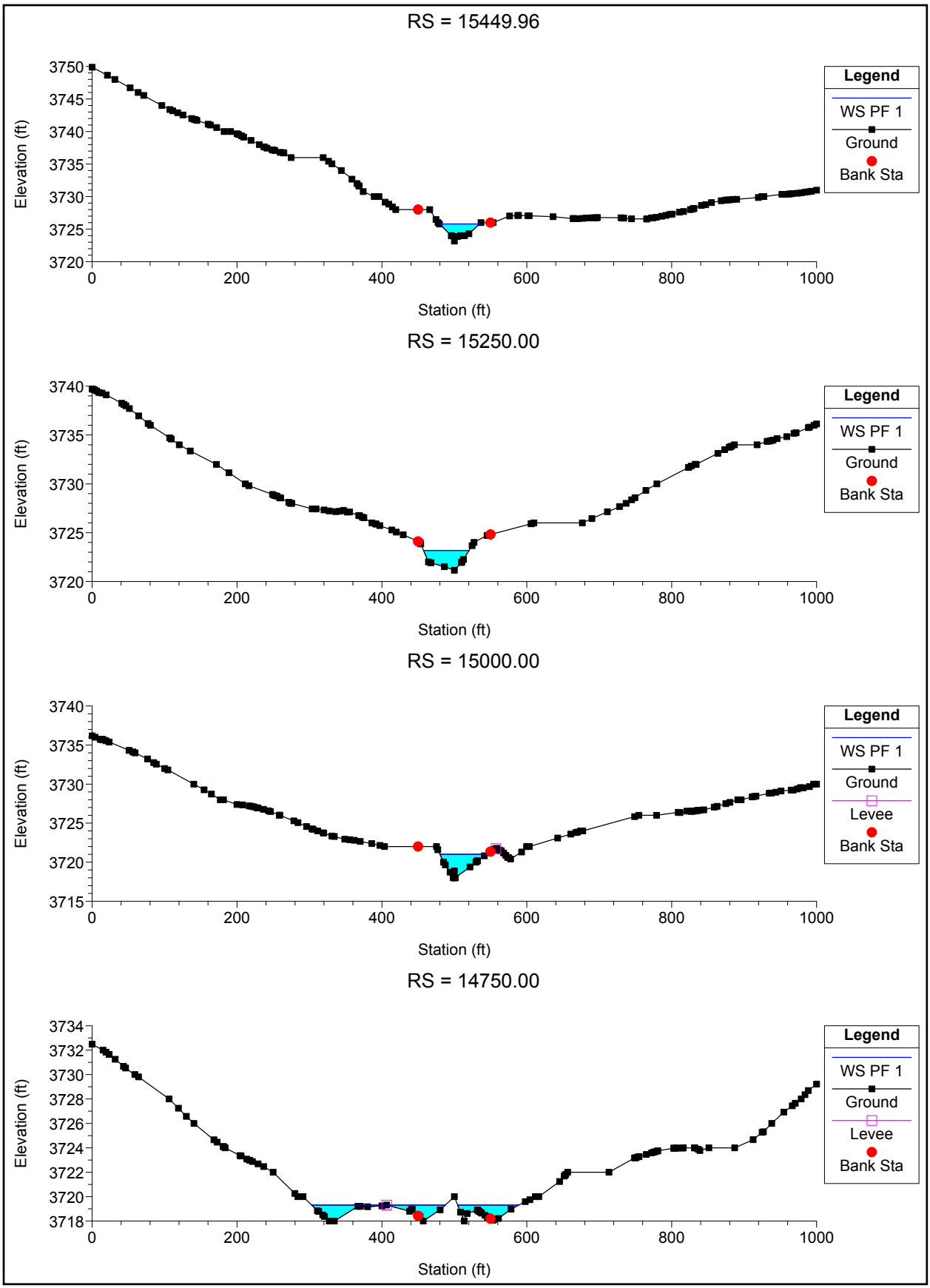
Ground
Levee
Bank Sta
RS = 15750.00
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3735
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 15250.00
Elevation (ft)
3740
3735
3730
3725
3720
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 15000.00
Elevation (ft)
3740
3735
3730
3725
3720
3715
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 14750.00
Elevation (ft)
3734
3732
3730
3728
3726
3724
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Legend
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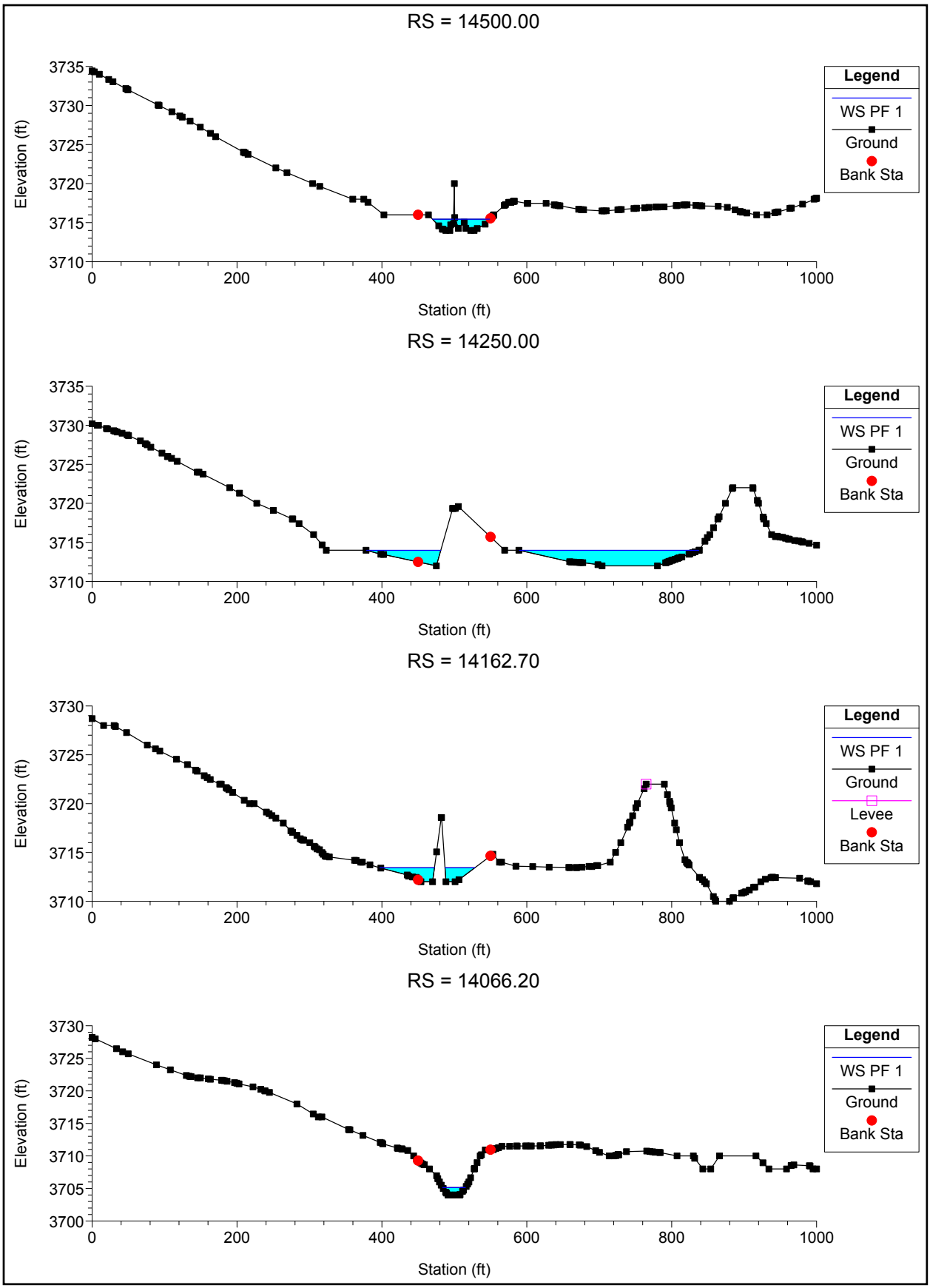
Ground
Levee
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 14250.00
Elevation (ft)
3735
3730
3725
3720
3715
3710
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 14162.70
Elevation (ft)
3730
3725
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 14066.20
Elevation (ft)
3730
3725
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3705
3700
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Station (ft)
Legend
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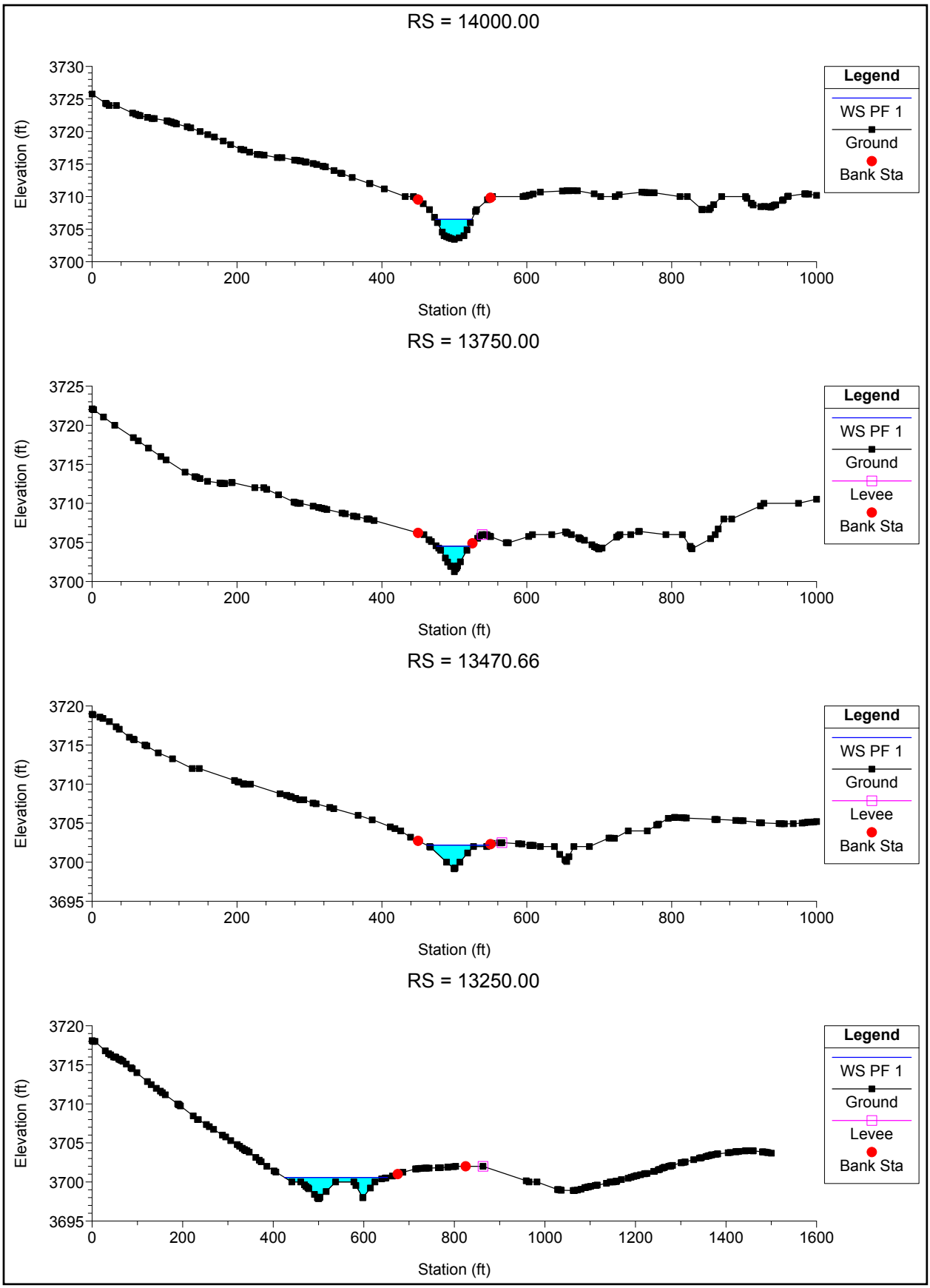
Ground
Bank Sta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800
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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 13750.00
Elevation (ft)
3725
3720
3715
3710
3705
3700
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400
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800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 13470.66
Elevation (ft)
3720
3715
3710
3705
3700
3695
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400
600
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1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 13250.00
Elevation (ft)
3720
3715
3710
3705
3700
3695
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1400
1600
Station (ft)
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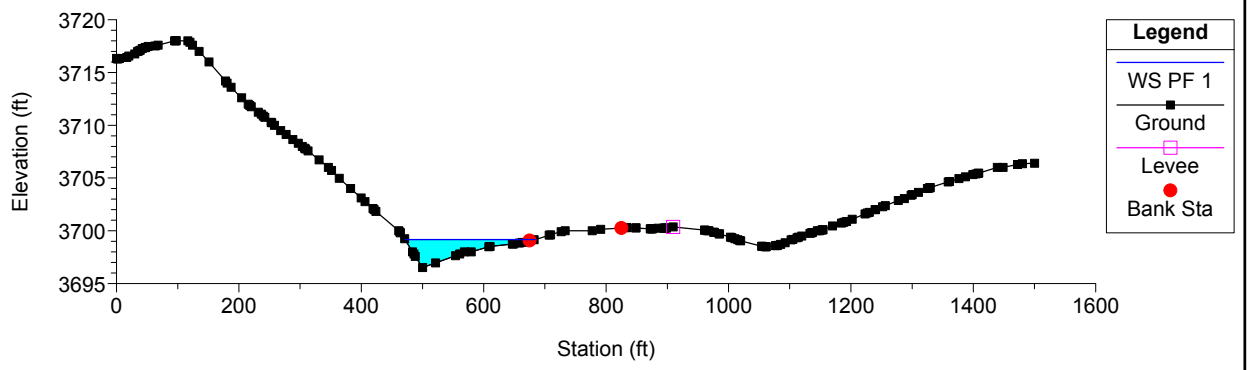
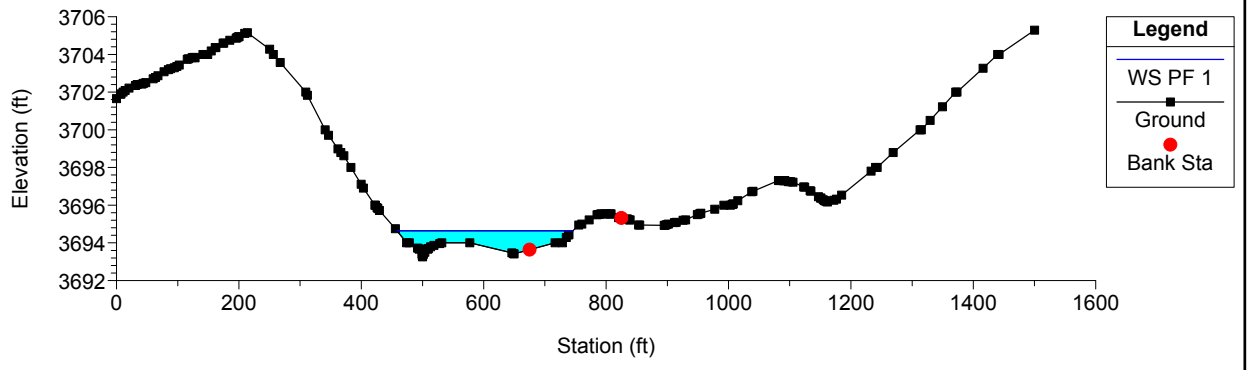
Levee
Bank Sta

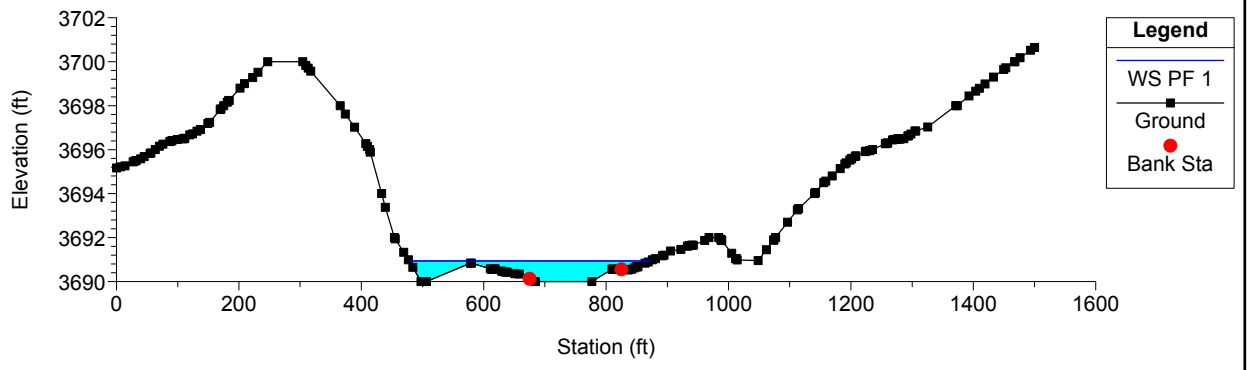
RS = 13048.33




RS = 12500.00




RS = 12250.00

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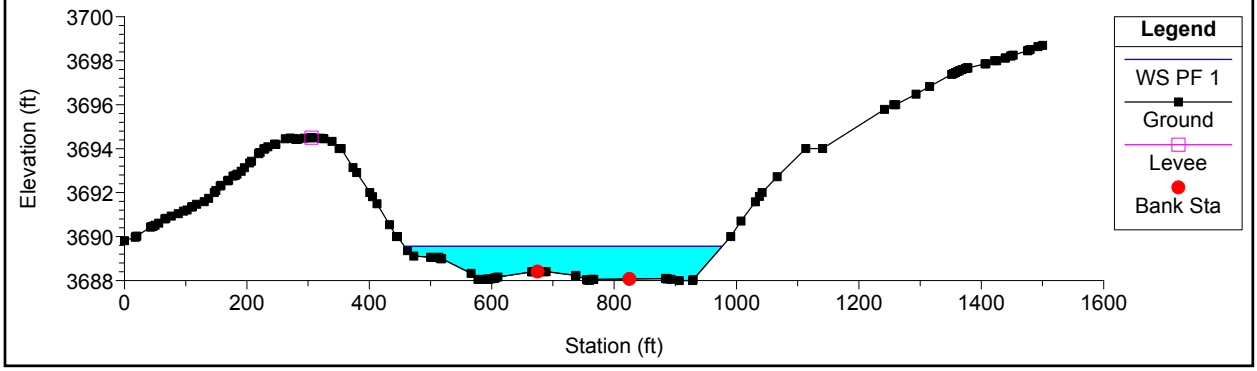

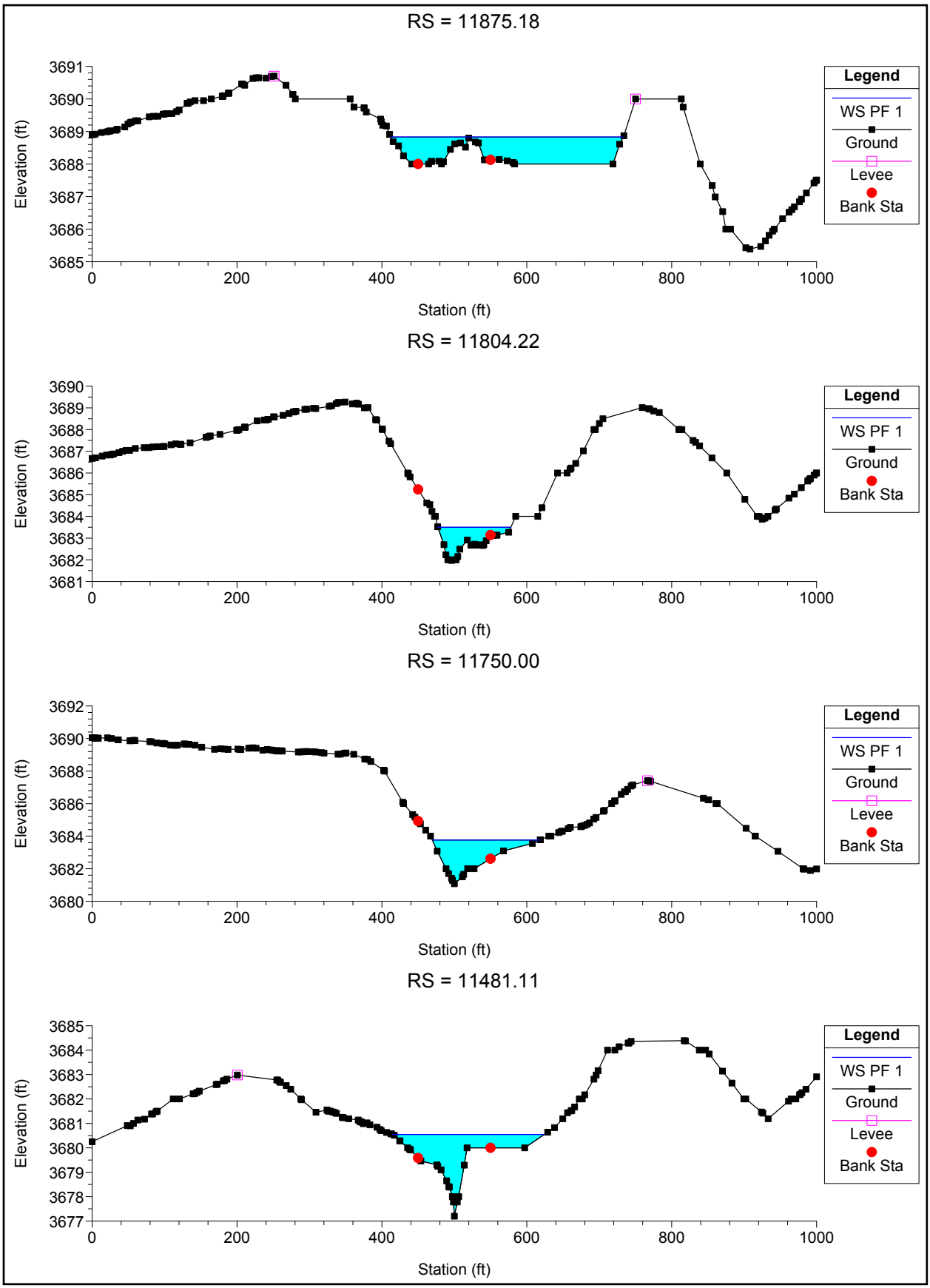
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3688
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3686
3685
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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 11804.22
Elevation (ft)
3690
3689
3688
3687
3686
3685
3684
3683
3682
3681
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 11750.00
Elevation (ft)
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3690
3688
3686
3684
3682
3680
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 11481.11
Elevation (ft)
3685
3684
3683
3682
3681
3680
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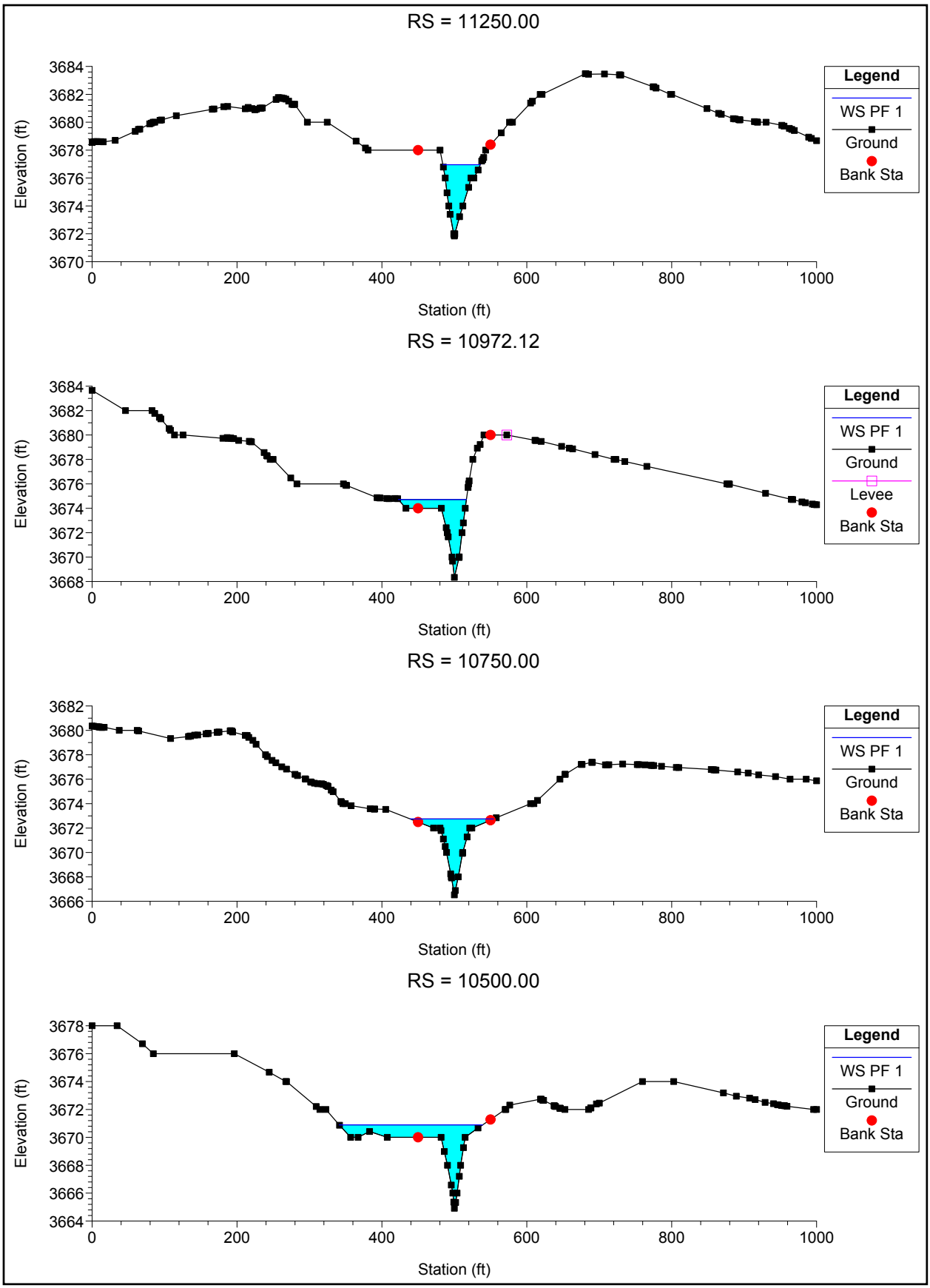
Levee
Bank Sta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1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 10972.12
Elevation (ft)
3684
3682
3680
3678
3676
3674
3672
3670
3668
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600
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1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 10750.00
Elevation (ft)
3682
3680
3678
3676
3674
3672
3670
3668
3666
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800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 10500.00
Elevation (ft)
3678
3676
3674
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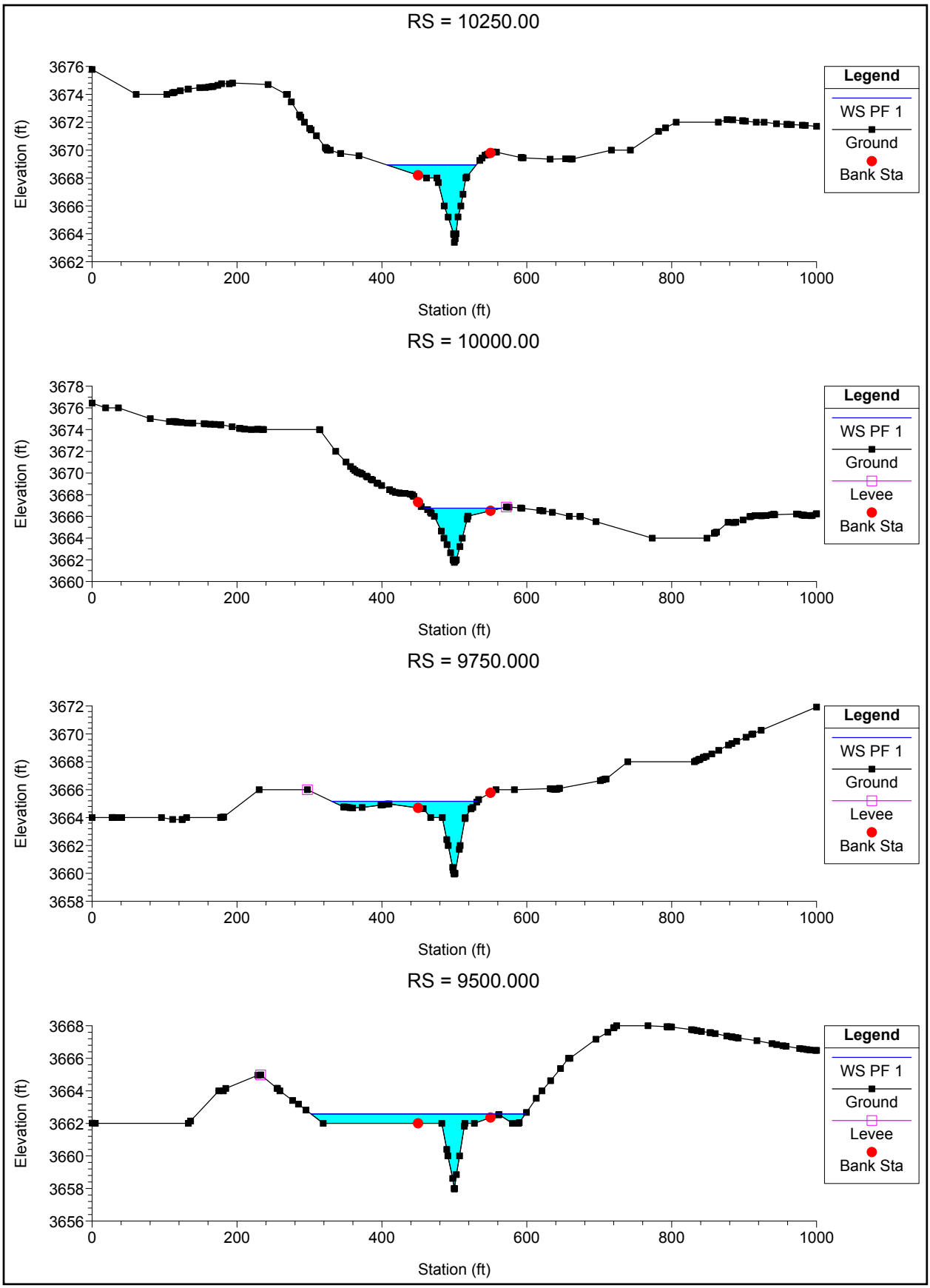
Bank Sta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800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 10000.00
Elevation (ft)
3678
3676
3674
3672
3670
3668
3666
3664
3662
3660
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9750.000
Elevation (ft)
3672
3670
3668
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3662
3660
3658
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9500.000
Elevation (ft)
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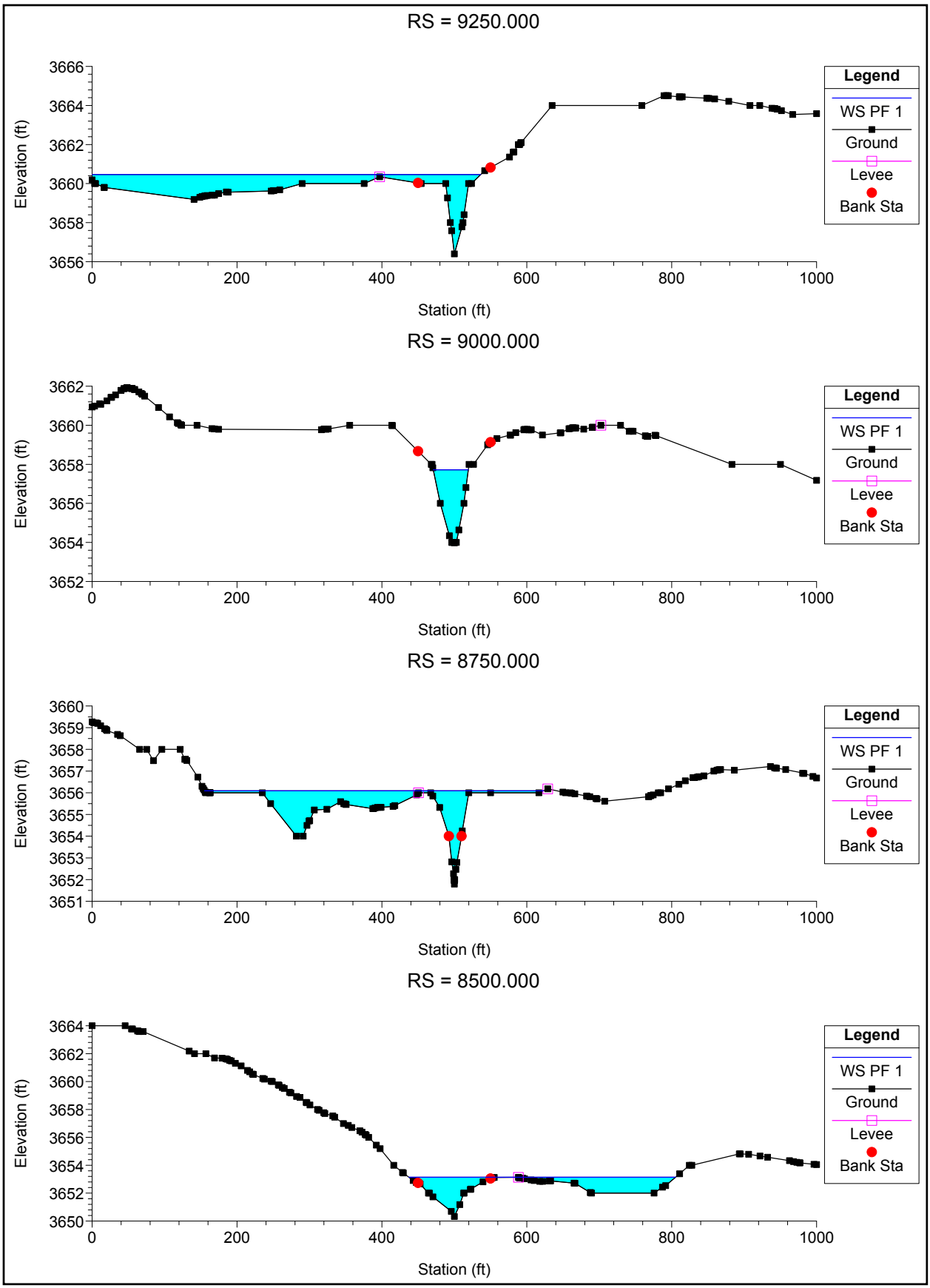
Bank Sta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600
800
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Levee
Bank Sta
RS = 9000.000
Elevation (ft)
3662
3660
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600
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1000
Station (ft)
Legend
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Levee
Bank Sta
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3660
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3654
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3652
3651
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Station (ft)
Legend
WS PF 1
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Levee
Bank Sta
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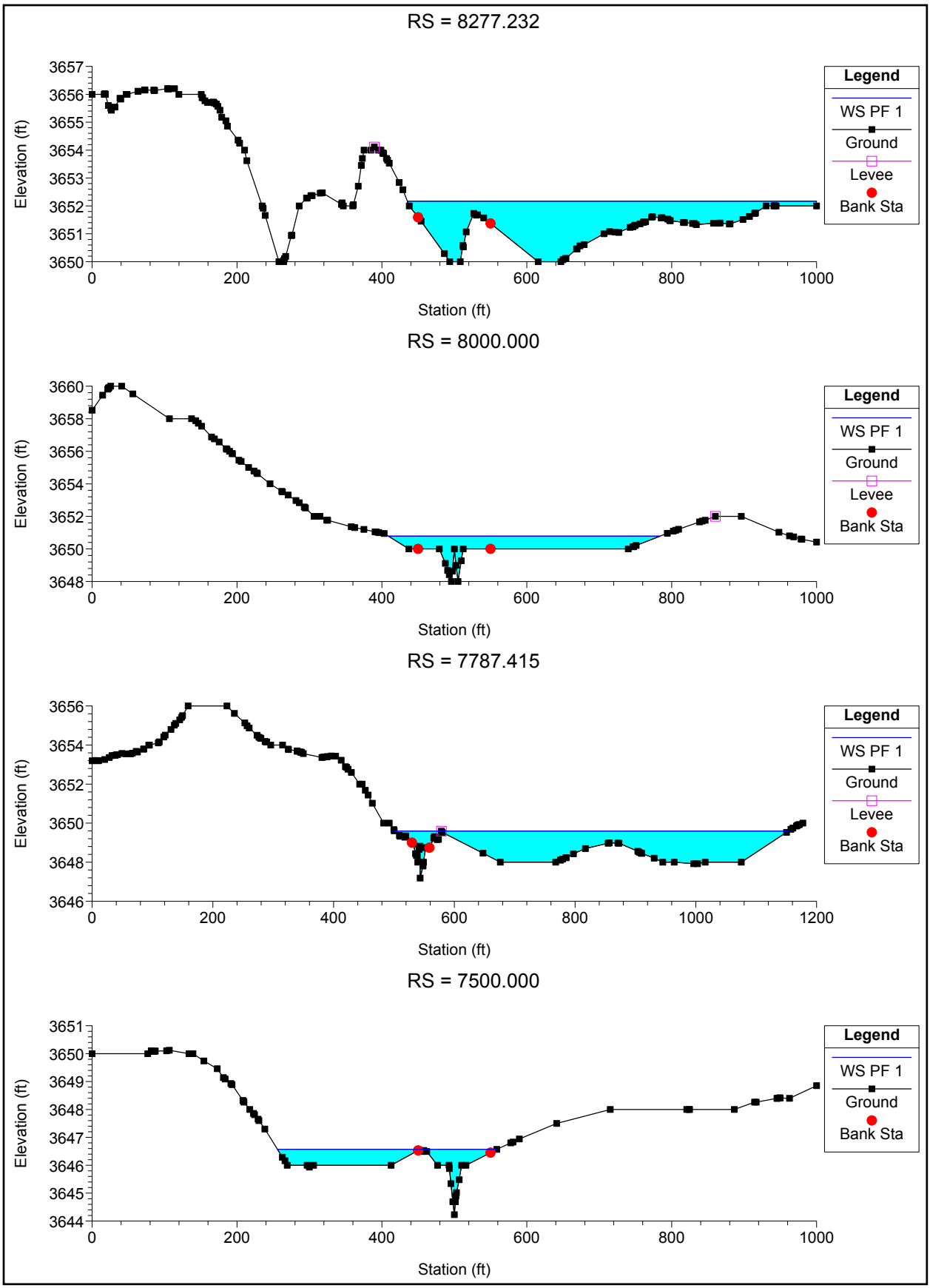
Bank Sta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Station (ft)
Legend
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Ground
Levee
Bank Sta
RS = 8000.000
Elevation (ft)
3660
3658
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3652
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3648
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600
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1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7787.415
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3654
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1200
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Legend
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Levee
Bank Sta
RS = 7500.000
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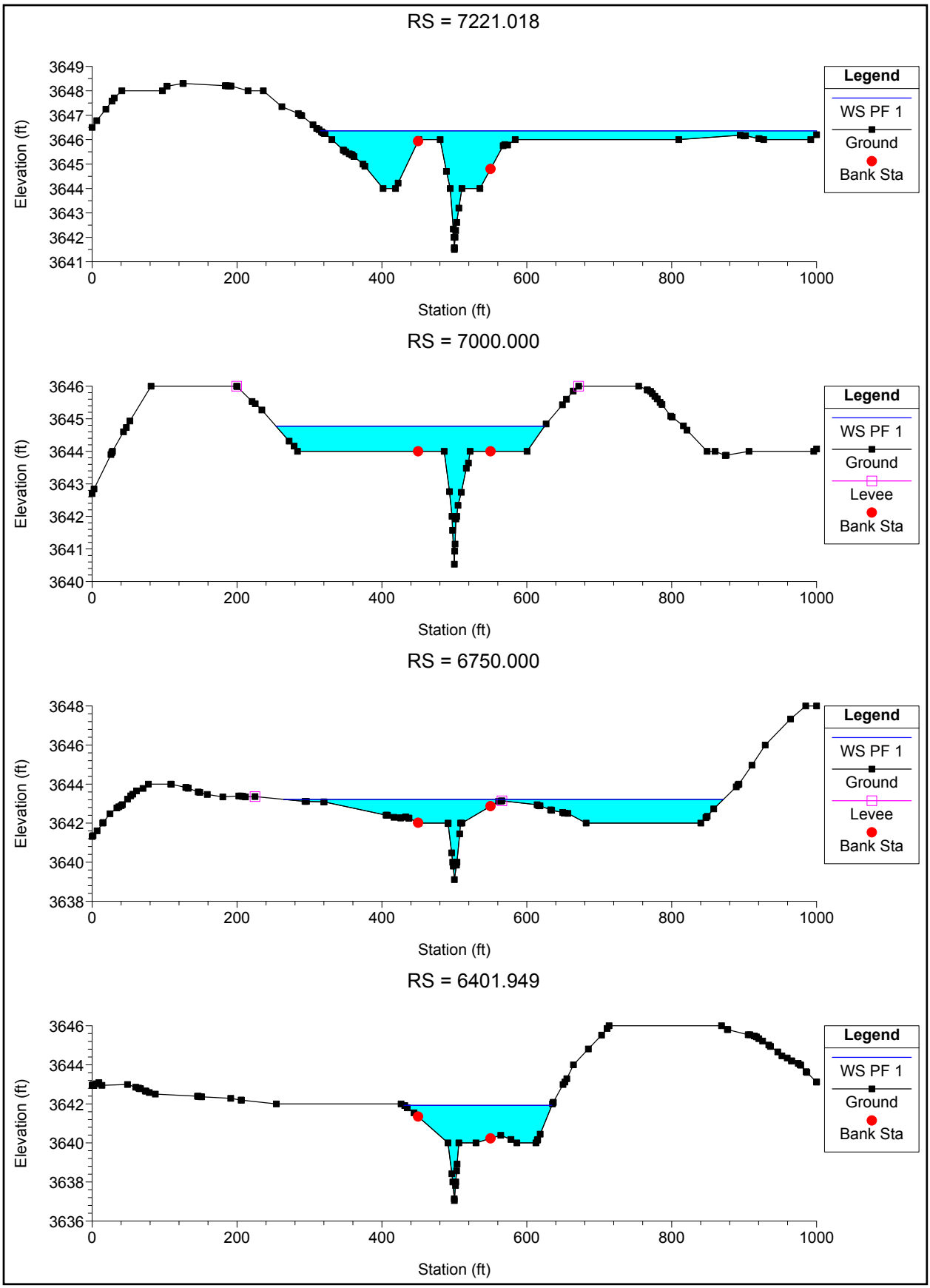
Bank Sta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Legend
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Ground
Bank Sta
RS = 7000.000
Elevation (ft)
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3643
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3640
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600
800
1000
Station (ft)
Legend
WS PF 1
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Levee
Bank Sta
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Elevation (ft)
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Station (ft)
Legend
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Levee
Bank Sta
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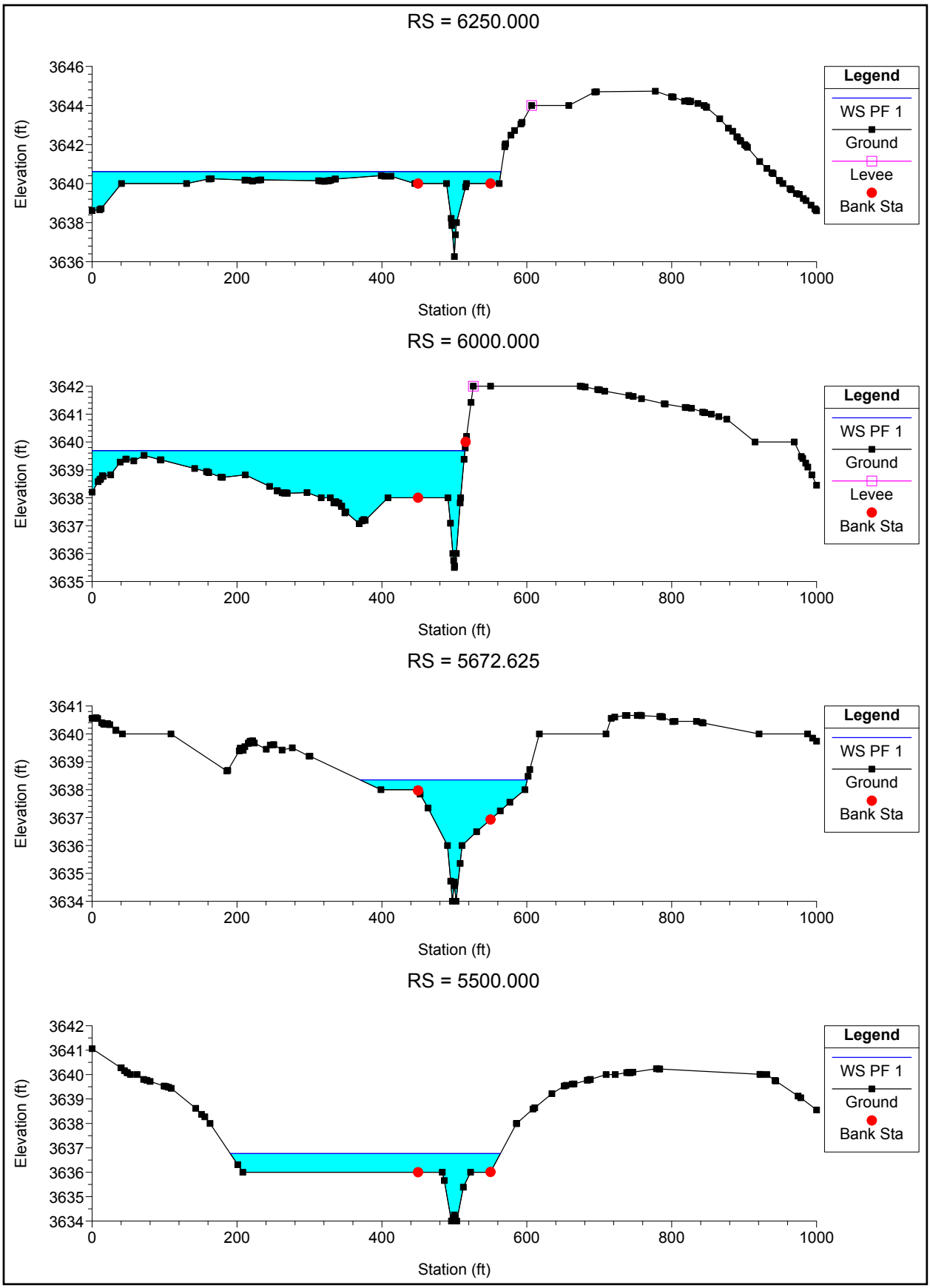
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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6000.000
Elevation (ft)
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3638
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3636
3635
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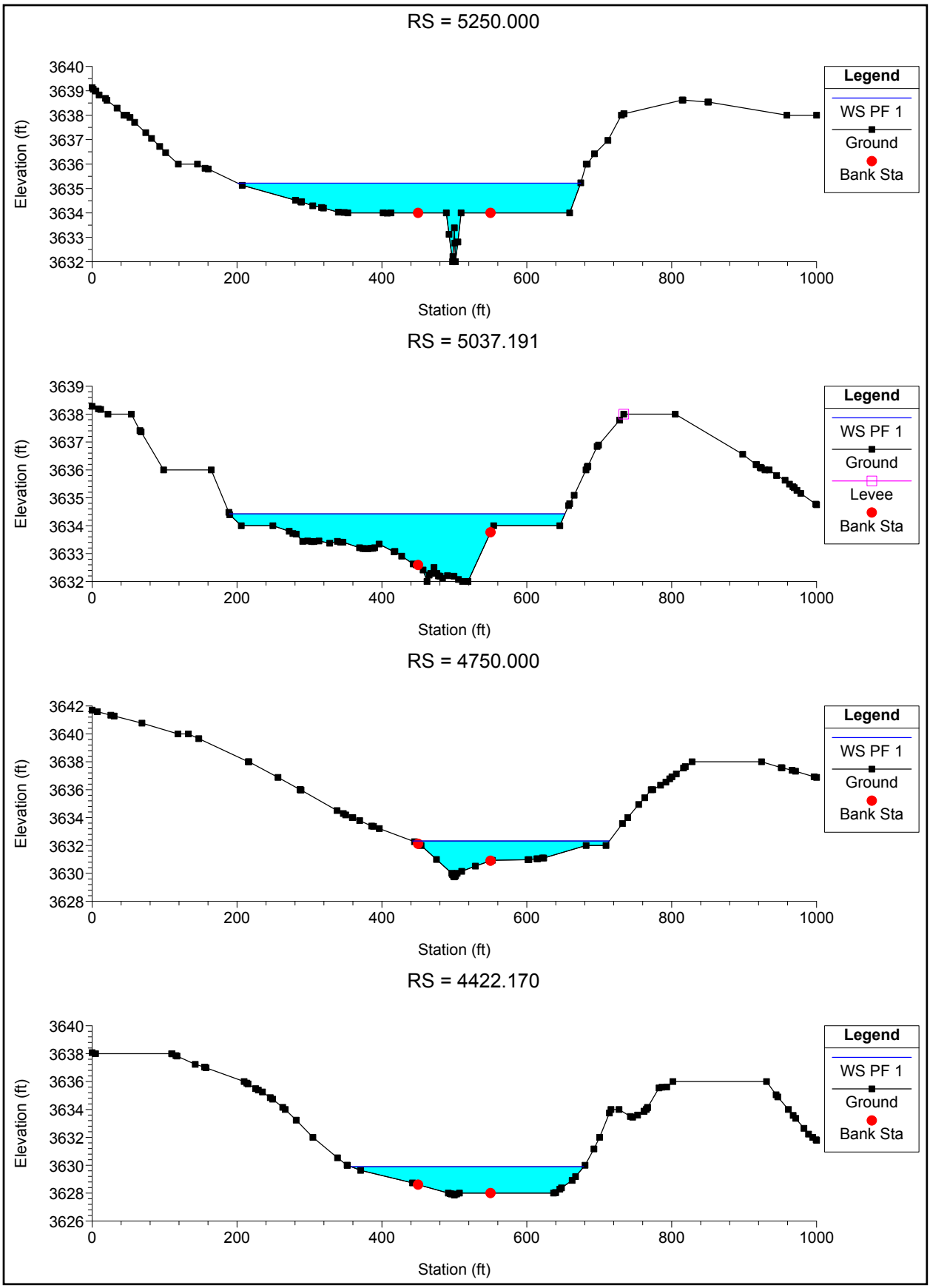
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5672.625
Elevation (ft)
3641
3640
3639
3638
3637
3636
3635
3634
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5500.000
Elevation (ft)
3642
3641
3640
3639
3638
3637
3636
3635
3634
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 5250.000
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Station (ft)
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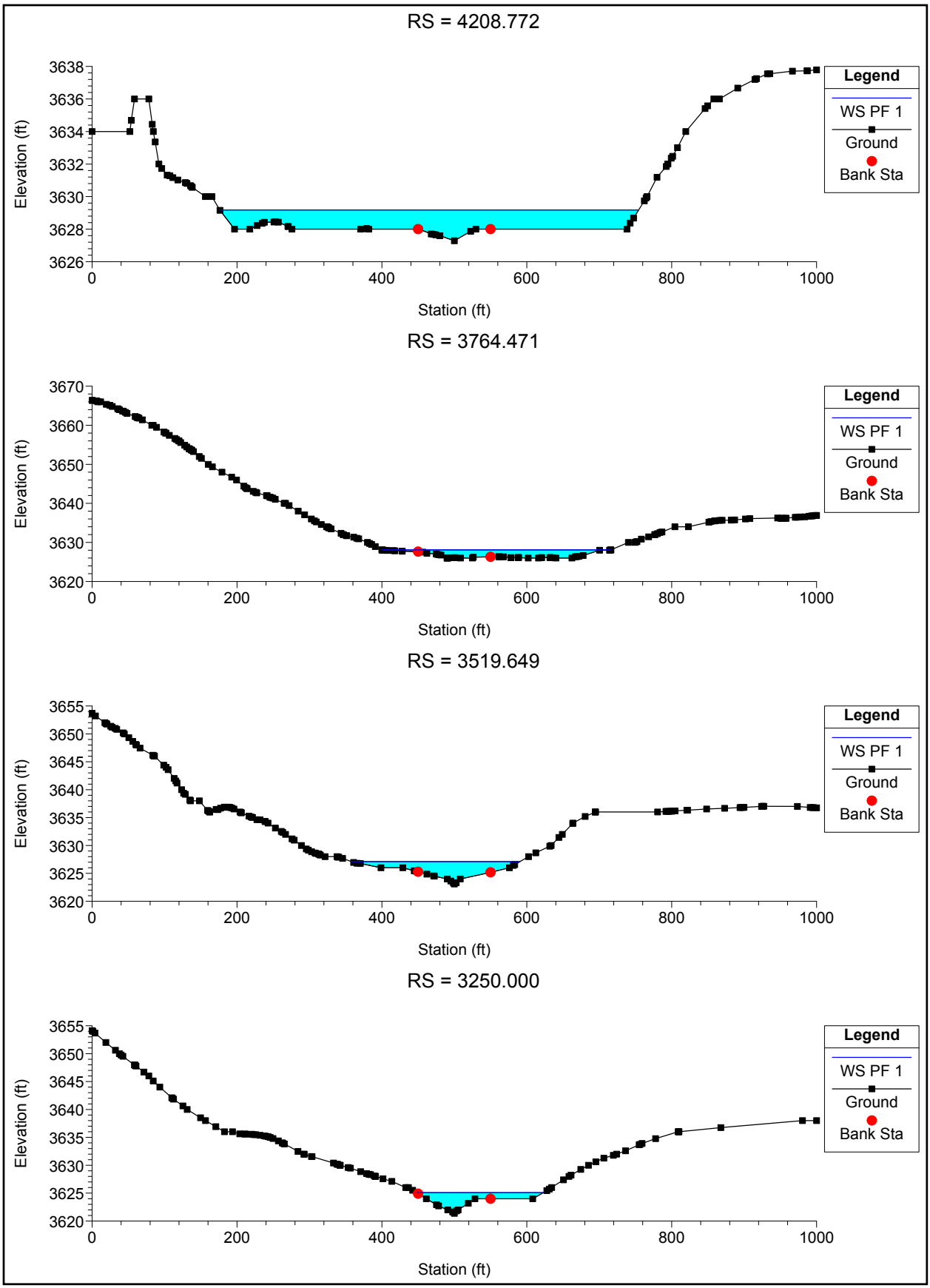
WS PF 1
Ground
Bank Sta
RS = 5037.191
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4422.170
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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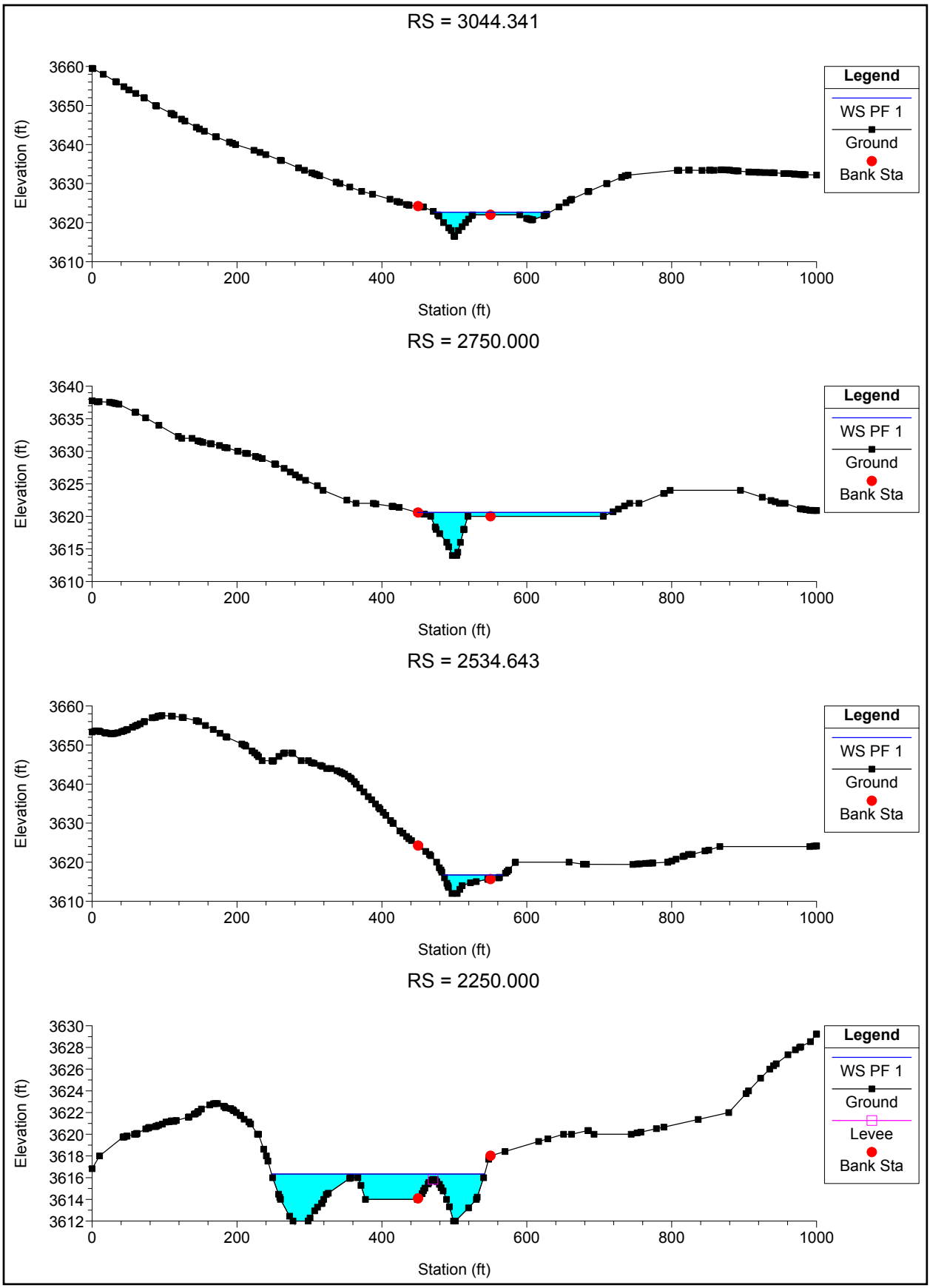
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3764.471
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3519.649
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3650
3640
3630
3620
3610
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2750.000
Elevation (ft)
3640
3635
3630
3625
3620
3615
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2534.643
Elevation (ft)
3660
3650
3640
3630
3620
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3630
3628
3626
3624
3622
3620
3618
3616
3614
3612
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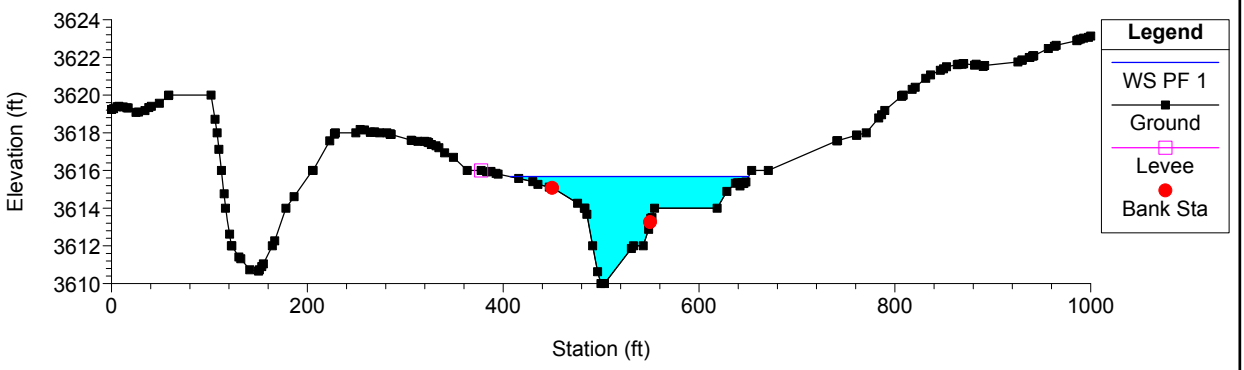
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

RS = 1933.837

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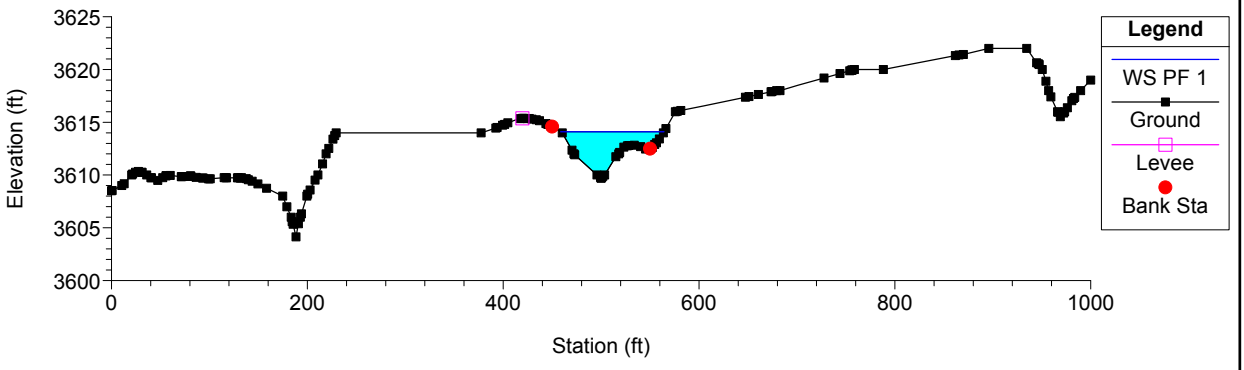


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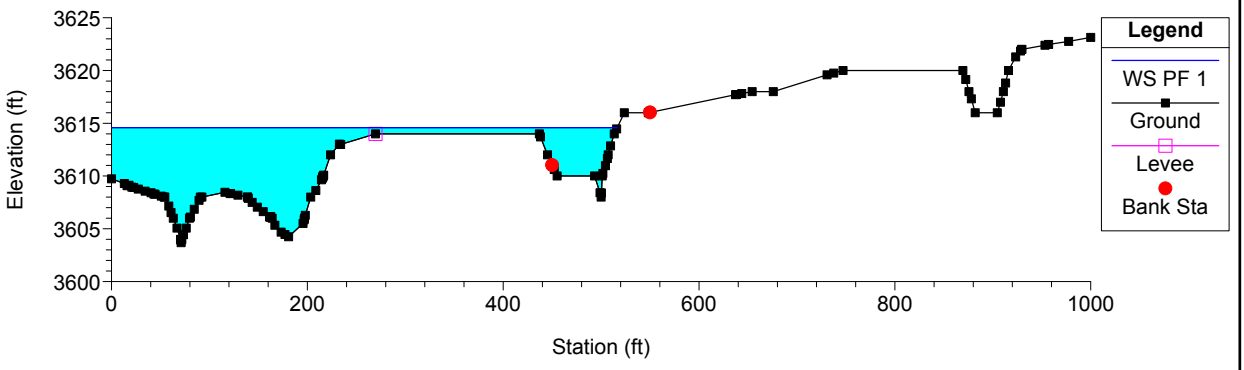


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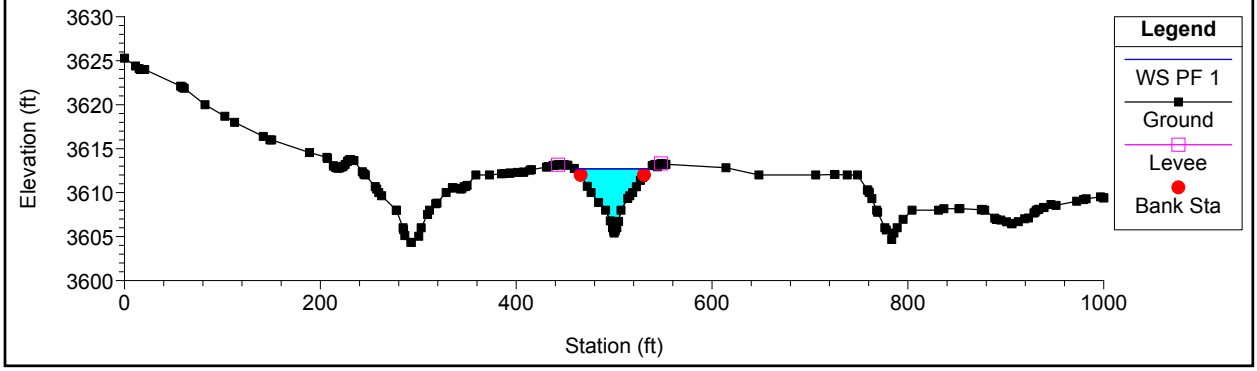

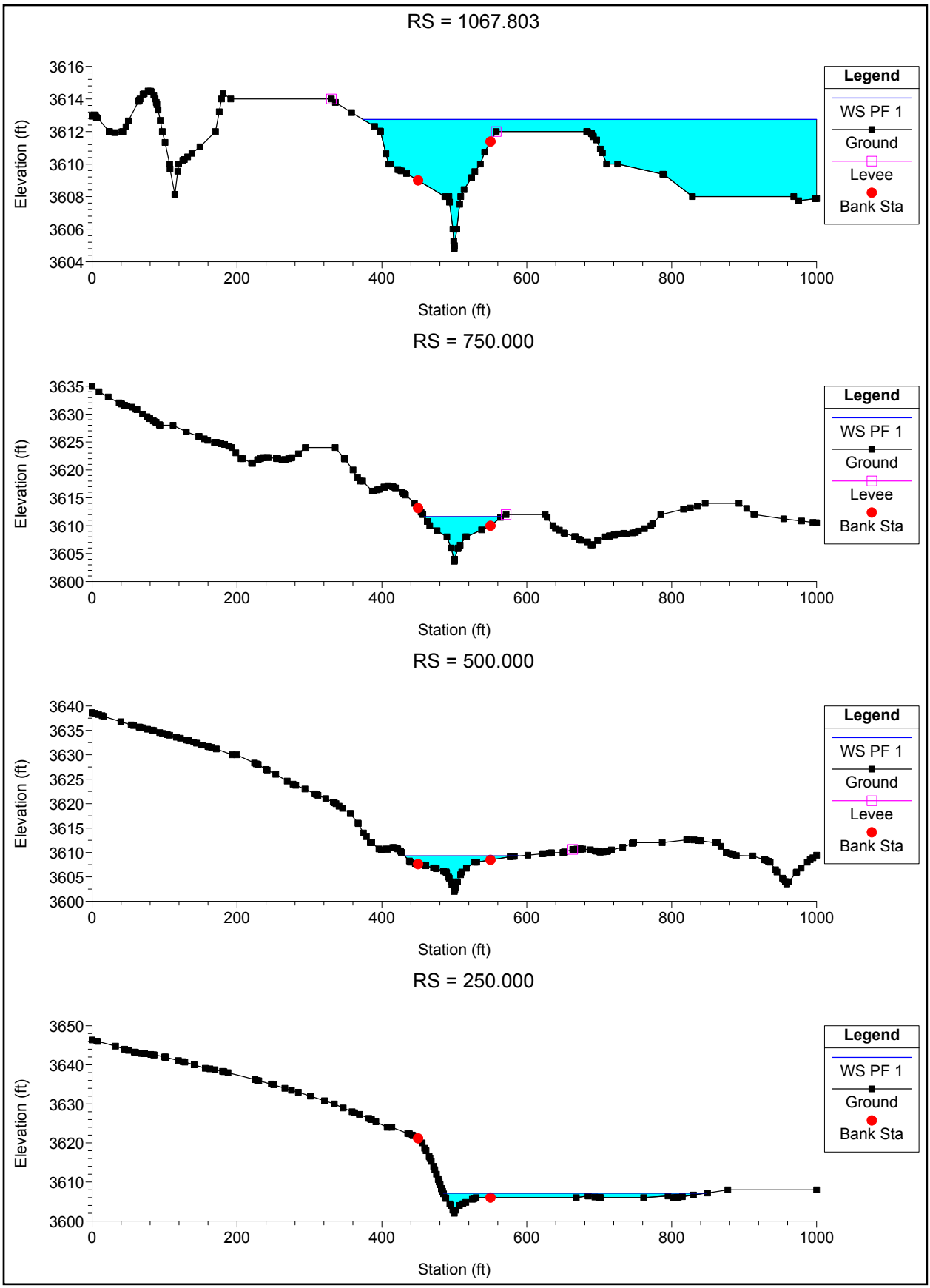
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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Elevation (ft)
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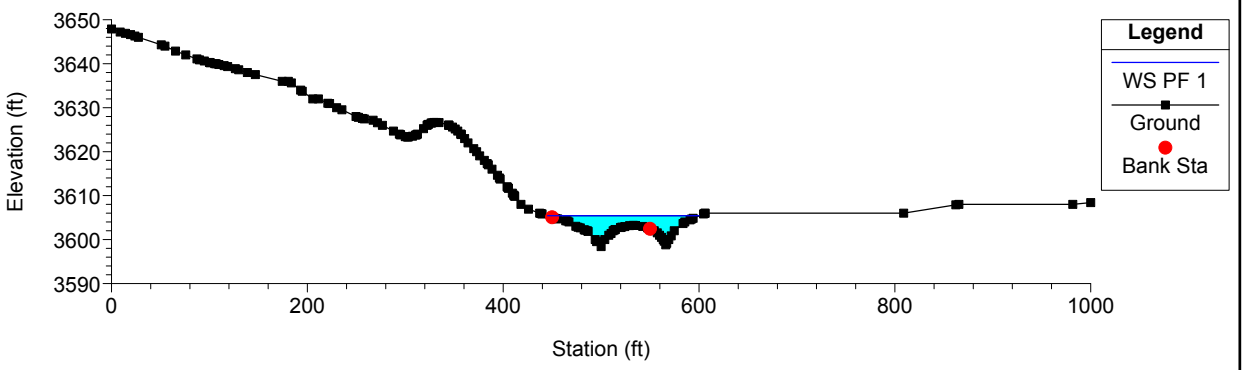
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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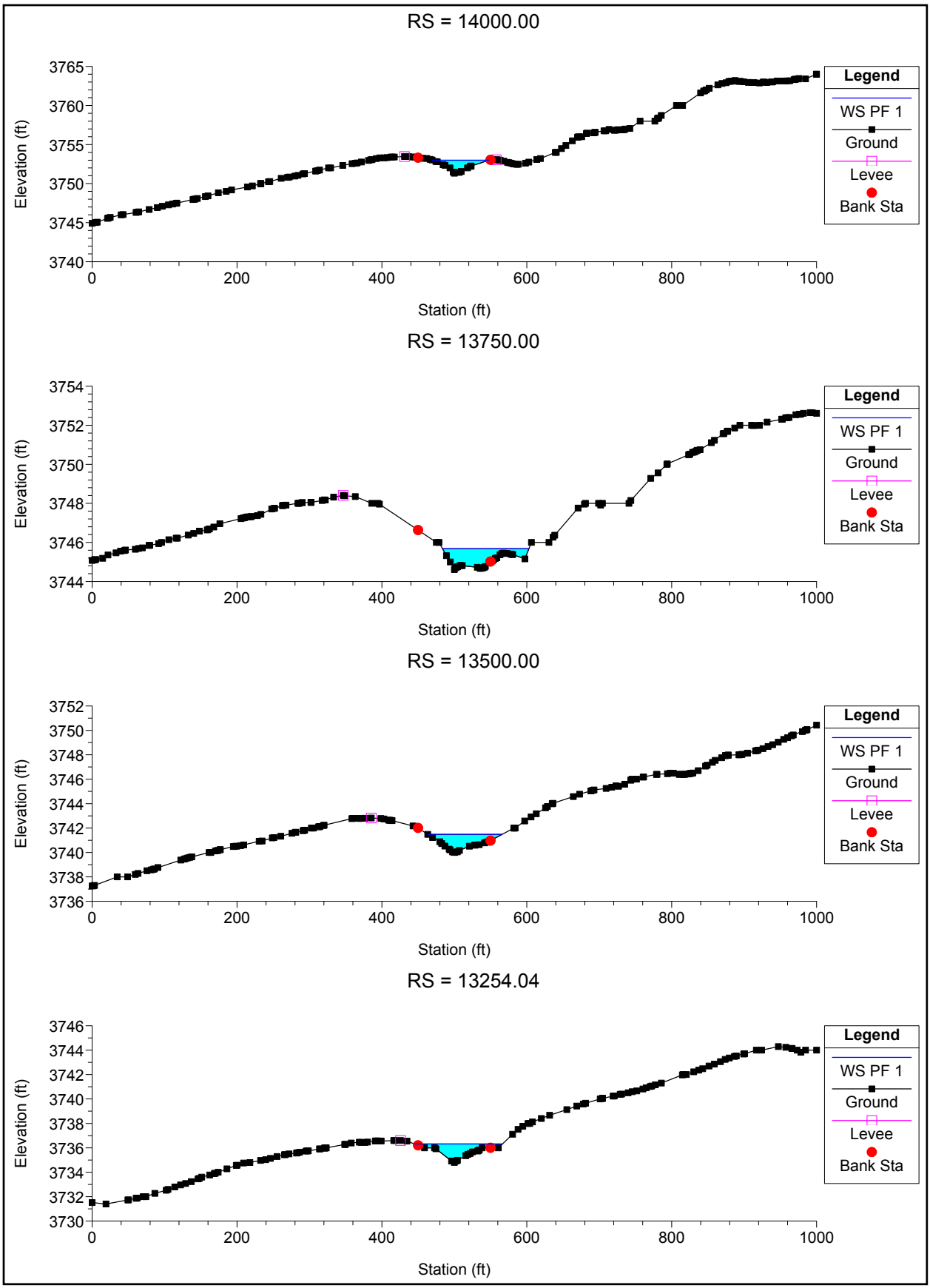
Elevation (ft)
3650
3640
3630
3620
3610
3600
3590
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-14

# HEC-RAS Channel 09A

| 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) | |
| 09A | 14000 | PF 1 | 392 | 3751.33 | 3753 | 3753.14 | 3753.69 | 0.036045 | 6.66 | 58.84 | 78.22 | 1.35 |
| 09A | 13750 | PF 1 | 392 | 3744.61 | 3745.68 | 3745.8 | 3746.17 | 0.026354 | 6 | 73.3 | 119.25 | 1.17 |
| 09A | 13500 | PF 1 | 392 | 3740 | 3741.48 | 3741.48 | 3741.87 | 0.017055 | 5.06 | 79.75 | 102.69 | 0.95 |
| 09A | 13254.04 | PF 1 | 392 | 3734.8 | 3736.32 | 3736.41 | 3736.77 | 0.026615 | 5.44 | 74.31 | 121.51 | 1.15 |
| 09A | 13000 | PF 1 | 392 | 3727.83 | 3729.76 | 3729.89 | 3730.45 | 0.023815 | 6.68 | 58.64 | 56.75 | 1.16 |
| 09A | 12750 | PF 1 | 392 | 3721.41 | 3723.68 | 3723.8 | 3724.22 | 0.026913 | 5.87 | 67.45 | 100.25 | 1.17 |
| 09A | 12500 | PF 1 | 392 | 3716.94 | 3719.22 | 3719.2 | 3719.66 | 0.017658 | 5.3 | 73.91 | 80.91 | 0.98 |
| 09A | 12270.11 | PF 1 | 392 | 3714.36 | 3715.81 | 3715.76 | 3716.13 | 0.015177 | 4.66 | 88.95 | 120.69 | 0.9 |
| 09A | 12000 | PF 1 | 392 | 3709.8 | 3712.02 | 3711.89 | 3712.43 | 0.012981 | 5.18 | 75.67 | 69.11 | 0.87 |
| 09A | 11750 | PF 1 | 392 | 3706.58 | 3708.75 | 3708.75 | 3709.15 | 0.015979 | 5.23 | 80.02 | 100.4 | 0.94 |
| 09A | 11527.1 | PF 1 | 392 | 3704 | 3705.81 | 3705.35 | 3705.93 | 0.003615 | 2.95 | 144.51 | 158.76 | 0.47 |
| 09A | 11250 | PF 1 | 392 | 3702.38 | 3703.79 | 3703.79 | 3704.15 | 0.016909 | 4.88 | 83.94 | 120.37 | 0.94 |
| 09A | 11000 | PF 1 | 392 | 3699.64 | 3700.72 | 3700.72 | 3700.73 | 0.000324 | 0.54 | 521.98 | 546.49 | 0.12 |
| 09A | 10750 | PF 1 | 392 | 3696.54 | 3697.03 | 3697.41 | 3700.12 | 0.450563 | 14.33 | 28.64 | 95.4 | 4.23 |
| 09A | 10500 | PF 1 | 392 | 3694.17 | 3695.29 | 3695.29 | 3695.62 | 0.016606 | 4.87 | 91.21 | 147.55 | 0.94 |
| 09A | 10235.98 | PF 1 | 392 | 3689.85 | 3691.06 | 3691.06 | 3691.07 | 0.000202 | 0.47 | 602.27 | 548.41 | 0.1 |
| 09A | 10000 | PF 1 | 392 | 3686.1 | 3687.51 | 3688.15 | 3690.59 | 0.18202 | 14.09 | 27.81 | 40.42 | 2.99 |
| 09A | 9750 | PF 1 | 392 | 3683.54 | 3684.75 | 3684.65 | 3684.92 | 0.010823 | 3.64 | 127.27 | 256.2 | 0.74 |
| 09A | 9500 | PF 1 | 392 | 3680.57 | 3681.91 | 3681.91 | 3682.11 | 0.014833 | 4.02 | 121.6 | 306.96 | 0.86 |
| 09A | 9250 | PF 1 | 392 | 3675.57 | 3677.09 | 3676.8 | 3677.3 | 0.007066 | 3.83 | 107.35 | 105.78 | 0.64 |
| 09A | 9000 | PF 1 | 392 | 3674 | 3675.4 | 3675.15 | 3675.65 | 0.008208 | 4.1 | 97.75 | 99.53 | 0.69 |
| 09A | 8750 | PF 1 | 392 | 3671.11 | 3672.73 | 3672.68 | 3673.13 | 0.015766 | 5.06 | 77.44 | 83.62 | 0.93 |
| 09A | 8500 | PF 1 | 392 | 3667 | 3668.59 | 3668.59 | 3668.99 | 0.01787 | 5.21 | 78.87 | 102.48 | 0.98 |
| 09A | 8250 | PF 1 | 392 | 3664.44 | 3666.57 | 3666.24 | 3666.73 | 0.005092 | 3.27 | 129.07 | 152.15 | 0.54 |
| 09A | 8008.953 | PF 1 | 421 | 3662.13 | 3664.87 | | 3665.21 | 0.010186 | 4.78 | 93.36 | 101.23 | 0.77 |
| 09A | 7750 | PF 1 | 421 | 3659.92 | 3663.55 | 3663.15 | 3663.81 | 0.006474 | 4.07 | 104.13 | 85.43 | 0.63 |
| 09A | 7504.629 | PF 1 | 421 | 3658.66 | 3661.31 | 3661.31 | 3661.83 | 0.019309 | 5.75 | 73.28 | 77.63 | 1.03 |
| 09A | 7500 | PF 1 | 421 | 3658.63 | 3661.58 | 3660.95 | 3661.64 | 0.001645 | 2.14 | 226.31 | 209.96 | 0.32 |
| 09A | 7208.917 | PF 1 | 421 | 3657.25 | 3660.91 | 3660.5 | 3661.12 | 0.005903 | 3.69 | 115.09 | 100.77 | 0.59 |
| 09A | 7000 | PF 1 | 421 | 3656.31 | 3658.84 | 3658.84 | 3659.33 | 0.018092 | 5.63 | 74.92 | 78.4 | 1 |
| 09A | 6731.53 | PF 1 | 421 | 3653.67 | 3657.28 | 3656.62 | 3657.42 | 0.003333 | 3.15 | 140.27 | 104.65 | 0.46 |
| 09A | 6500 | PF 1 | 421 | 3652.69 | 3656.34 | | 3656.58 | 0.006248 | 4.02 | 106.52 | 90.79 | 0.62 |
| 09A | 6271.982 | PF 1 | 421 | 3651.64 | 3655.12 | | 3655.31 | 0.005594 | 3.54 | 121.45 | 121.11 | 0.57 |
| 09A | 5989.433 | PF 1 | 421 | 3650.04 | 3653.55 | | 3653.9 | 0.009871 | 4.78 | 88.09 | 72.49 | 0.76 |
| 09A | 5750 | PF 1 | 421 | 3649.38 | 3652.43 | | 3652.58 | 0.003449 | 3.29 | 140.76 | 129.67 | 0.47 |
| 09A | 5500 | PF 1 | 421 | 3648.72 | 3650.77 | 3650.77 | 3651.15 | 0.017893 | 5.11 | 88.16 | 119.23 | 0.97 |
| 09A | 5224.224 | PF 1 | 421 | 3647.78 | 3649.69 | 3649 | 3649.82 | 0.002947 | 3 | 145.79 | 104.66 | 0.43 |
| 09A | 5000 | PF 1 | 421 | 3645.12 | 3648.5 | | 3648.84 | 0.008072 | 4.72 | 93.08 | 85.69 | 0.7 |
| 09A | 4750 | PF 1 | 421 | 3643.93 | 3647.49 | | 3647.62 | 0.003544 | 2.99 | 151.26 | 147.1 | 0.46 |
| 09A | 4500 | PF 1 | 421 | 3642.81 | 3646.13 | 3646.13 | 3646.38 | 0.010472 | 4.16 | 120.05 | 304.99 | 0.75 |
| 09A | 4187.531 | PF 1 | 421 | 3641.52 | 3643.3 | 3642.87 | 3643.46 | 0.004835 | 3.4 | 130.52 | 115.46 | 0.54 |
| 09A | 4000 | PF 1 | 421 | 3640.68 | 3642.84 | | 3642.92 | 0.001956 | 2.43 | 185.85 | 143.86 | 0.35 |
| 09A | 3750 | PF 1 | 617 | 3639.7 | 3641.46 | 3641.4 | 3641.91 | 0.014083 | 5.44 | 116.29 | 114.34 | 0.91 |
| 09A | 3500 | PF 1 | 617 | 3634.62 | 3637.79 | 3637.79 | 3638.41 | 0.015353 | 6.34 | 98.92 | 84.87 | 0.97 |
| 09A | 3260.511 | PF 1 | 617 | 3629.6 | 3633.16 | 3632.76 | 3633.47 | 0.006399 | 4.42 | 140.99 | 104.94 | 0.64 |

| 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) | |
| 09A | 3034.916 | PF 1 | 617 | 3628.08 | 3630.57 | 3630.57 | 3631.39 | 0.015719 | 7.29 | 84.61 | 52.18 | 1.01 |
| 09A | 2750 | PF 1 | 617 | 3627.49 | 3630.06 | 3629.87 | 3630.08 | 0.000808 | 1.51 | 525.86 | 568.56 | 0.22 |
| 09A | 2500 | PF 1 | 617 | 3627.02 | 3629.63 | 3629.09 | 3629.74 | 0.003427 | 2.98 | 239.72 | 242.43 | 0.46 |
| 09A | 2250 | PF 1 | 617 | 3626 | 3628.31 | 3628.31 | 3628.61 | 0.007443 | 4.79 | 169.65 | 273.14 | 0.69 |
| 09A | 1979.219 | PF 1 | 617 | 3626.05 | 3626.95 | 3626.17 | 3626.97 | 0.000569 | 0.89 | 565.62 | 507.15 | 0.17 |
| 09A | 1744.467 | PF 1 | 617 | 3621.99 | 3625.81 | 3625.81 | 3626.58 | 0.016185 | 7.07 | 87.32 | 57.65 | 1.01 |
| 09A | 1500 | PF 1 | 617 | 3619.68 | 3623.74 | 3622.52 | 3623.93 | 0.002345 | 3.53 | 174.74 | 77.15 | 0.41 |
| 09A | 1250 | PF 1 | 617 | 3618.83 | 3623.15 | 3622.5 | 3623.29 | 0.002722 | 3.18 | 217.86 | 160.48 | 0.43 |
| 09A | 1000 | PF 1 | 617 | 3617.94 | 3621.53 | 3621.22 | 3622.1 | 0.00947 | 6.04 | 102.15 | 57.29 | 0.8 |
| 09A | 750 | PF 1 | 617 | 3615.18 | 3619.14 | 3619.14 | 3620.1 | 0.014552 | 7.86 | 78.53 | 40.46 | 0.99 |
| 09A | 500 | PF 1 | 617 | 3611.9 | 3616.12 | 3615.77 | 3616.86 | 0.009249 | 6.91 | 89.32 | 39.62 | 0.81 |
| 09A | 250 | PF 1 | 617 | 3610.92 | 3613.72 | 3613.64 | 3614.3 | 0.01354 | 6.12 | 100.87 | 72.94 | 0.92 |
| 09A | 0 | PF 1 | 617 | 3608 | 3611.26 | 3611.09 | 3611.68 | 0.011004 | 5.51 | 118.83 | 94.43 | 0.82 |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3745
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 13750.00
Elevation (ft)
3754
3752
3750
3748
3746
3744
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 13500.00
Elevation (ft)
3752
3750
3748
3746
3744
3742
3740
3738
3736
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 13254.04
Elevation (ft)
3746
3744
3742
3740
3738
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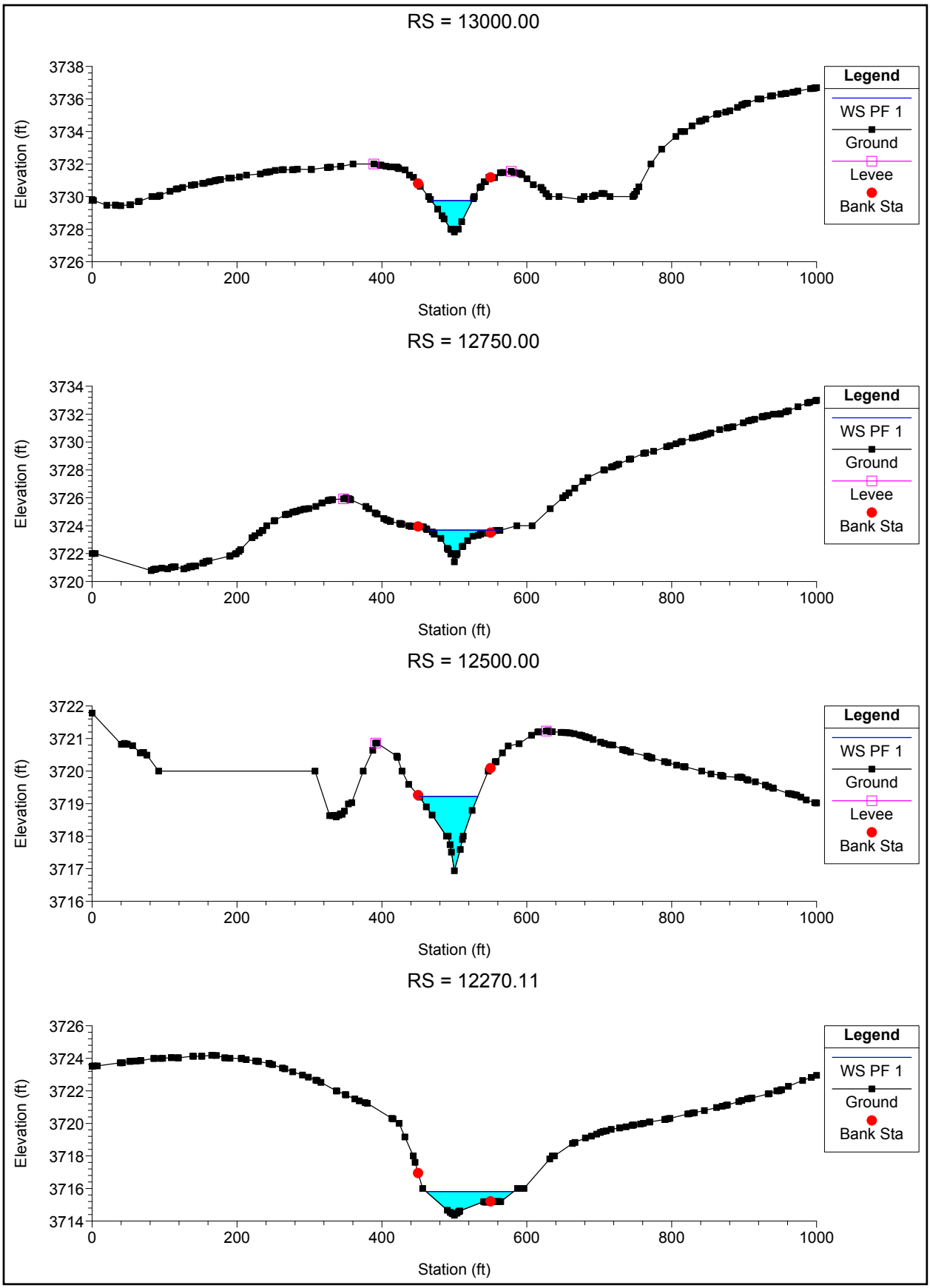
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 12750.00
Elevation (ft)
3734
3732
3730
3728
3726
3724
3722
3720
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 12500.00
Elevation (ft)
3722
3721
3720
3719
3718
3717
3716
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 12270.11
Elevation (ft)
3726
3724
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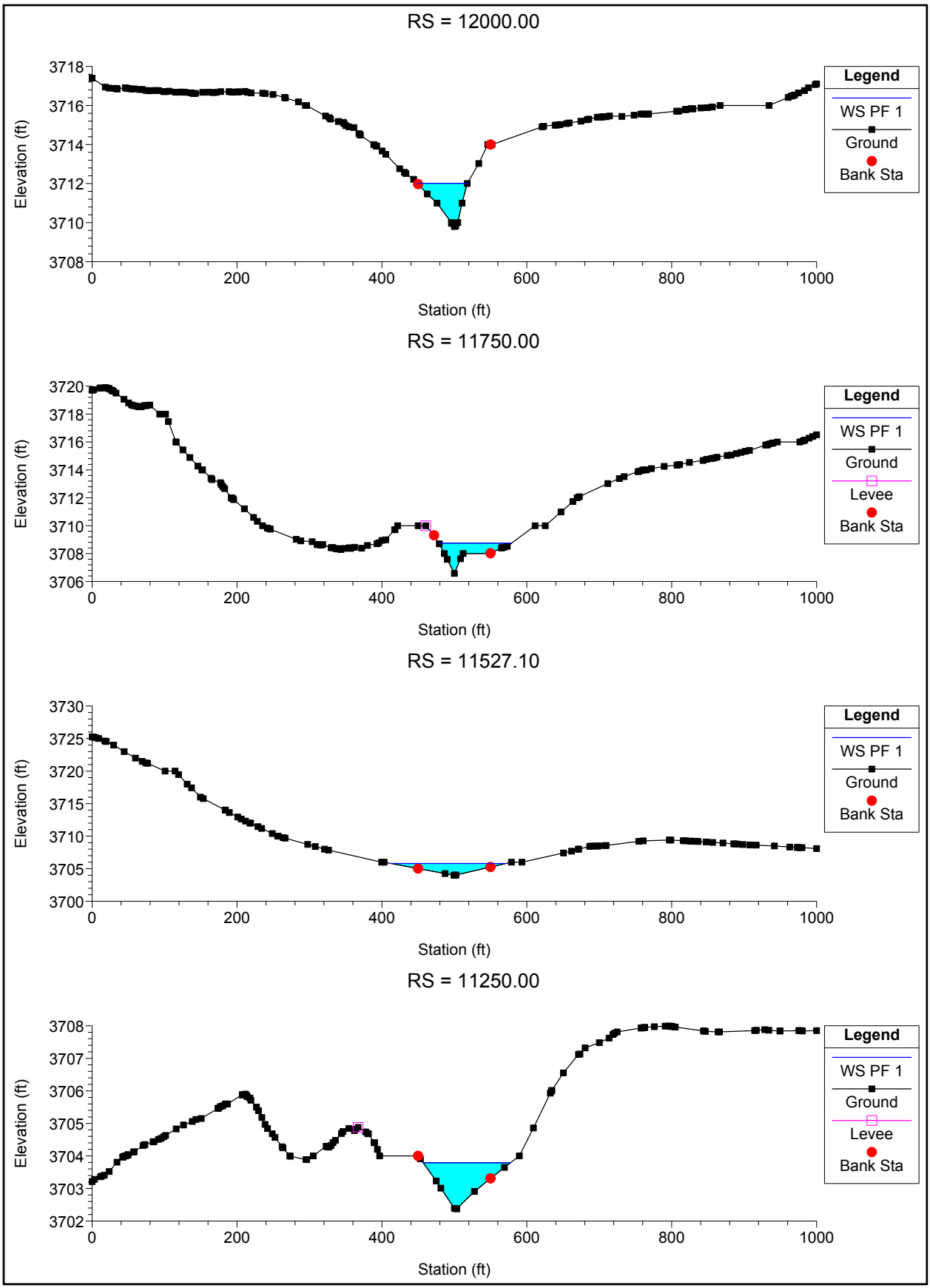
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
3718
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3714
3712
3710
3708
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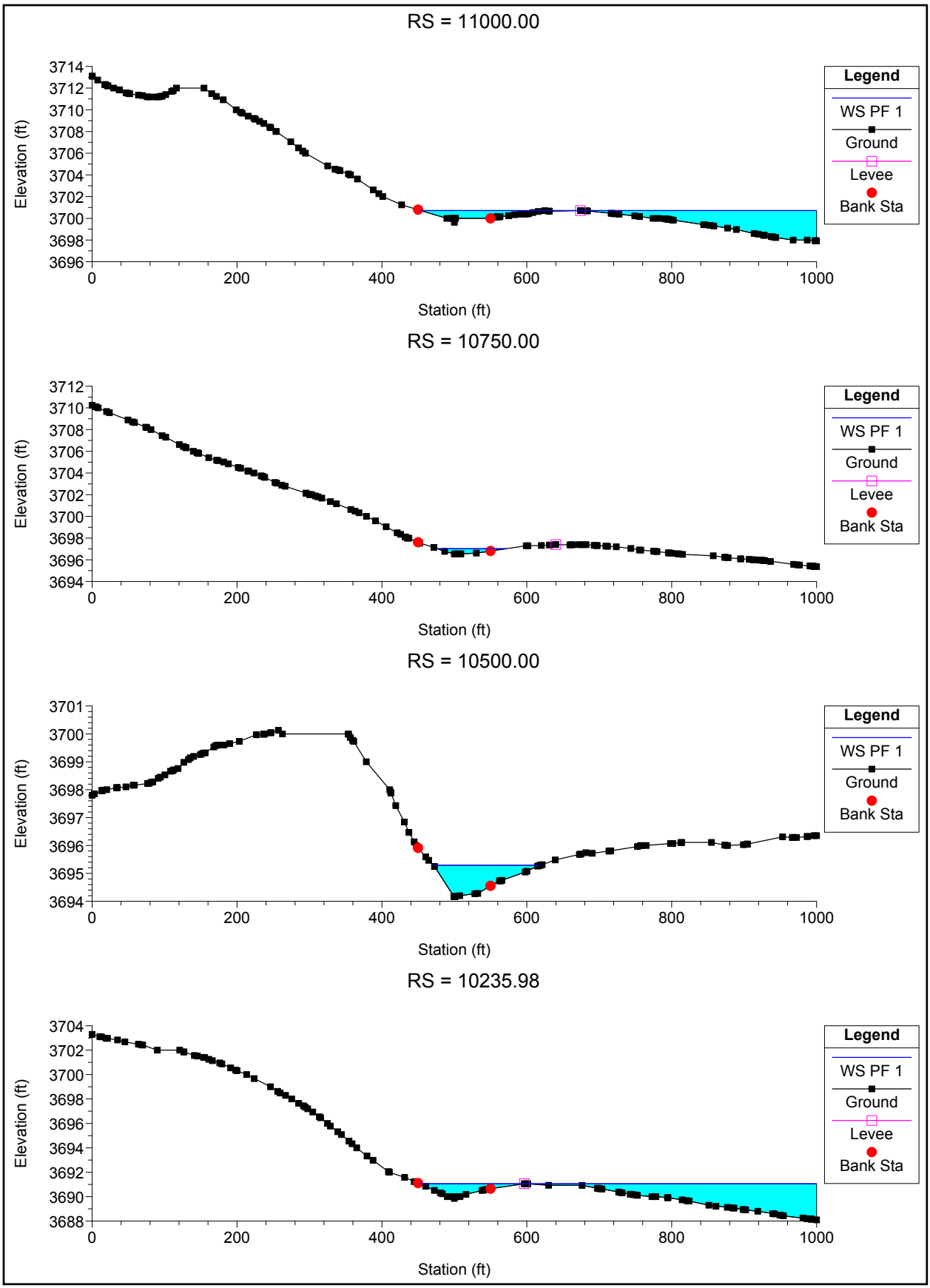
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 11750.00
Elevation (ft)
3720
3718
3716
3714
3712
3710
3708
3706
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 11527.10
Elevation (ft)
3730
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 11250.00
Elevation (ft)
3708
3707
3706
3705
3704
3703
3702
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
3714
3712
3710
3708
3706
3704
3702
3700
3698
3696
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 10750.00
Elevation (ft)
3712
3710
3708
3706
3704
3702
3700
3698
3696
3694
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 10500.00
Elevation (ft)
3701
3700
3699
3698
3697
3696
3695
3694
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 10235.98
Elevation (ft)
3704
3702
3700
3698
3696
3694
3692
3690
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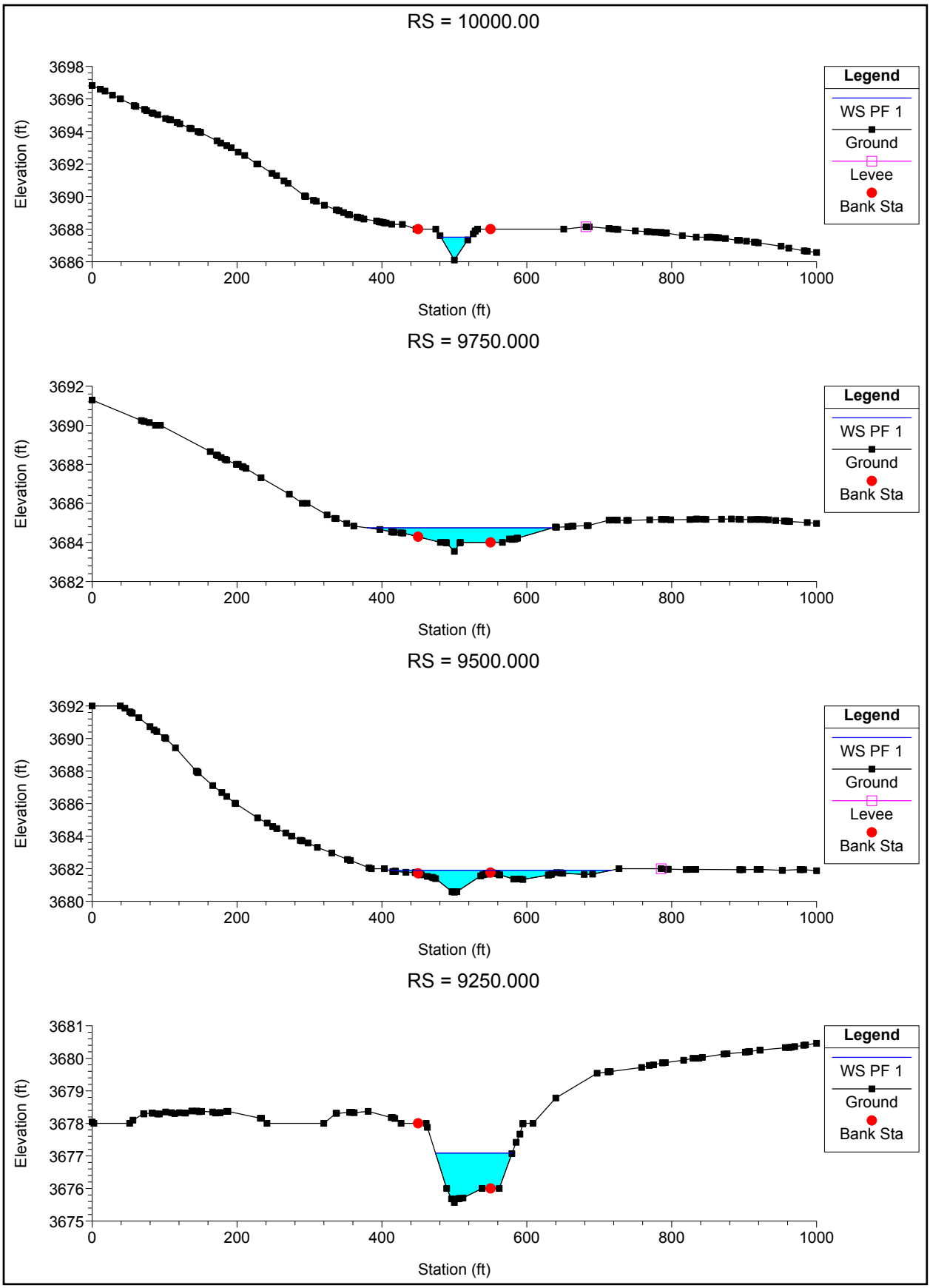
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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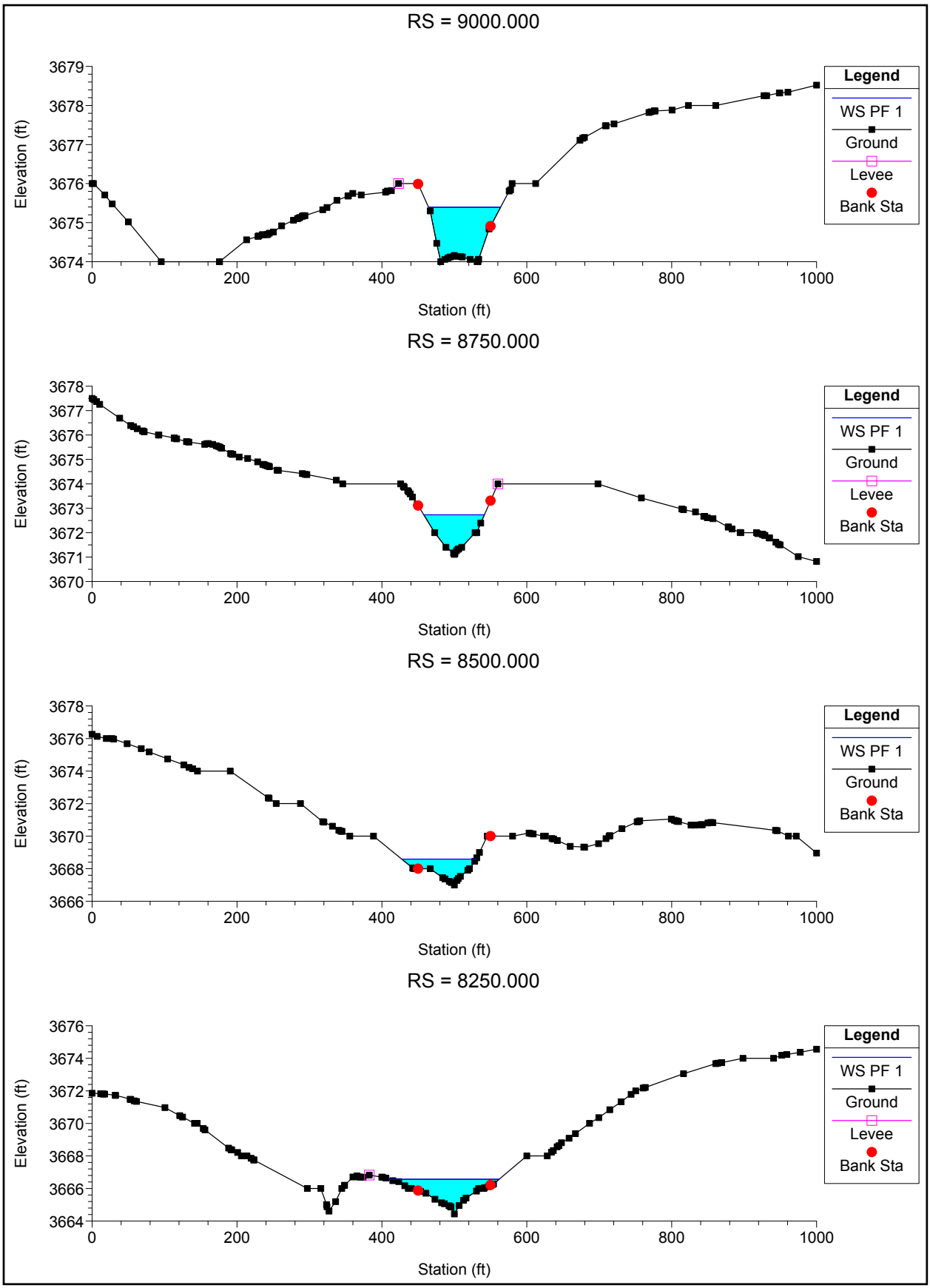
3696
3694
3692
3690
3688
3686
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9750.000
Elevation (ft)
3692
3690
3688
3686
3684
3682
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 9500.000
Elevation (ft)
3692
3690
3688
3686
3684
3682
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9250.000
Elevation (ft)
3681
3680
3679
3678
3677
3676
3675
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 9000.000
Elevation (ft)
3679
3678
3677
3676
3675
3674
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 8750.000
Elevation (ft)
3678
3677
3676
3675
3674
3673
3672
3671
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 8500.000
Elevation (ft)
3678
3676
3674
3672
3670
3668
3666
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 8250.000
Elevation (ft)
3676
3674
3672
3670
3668
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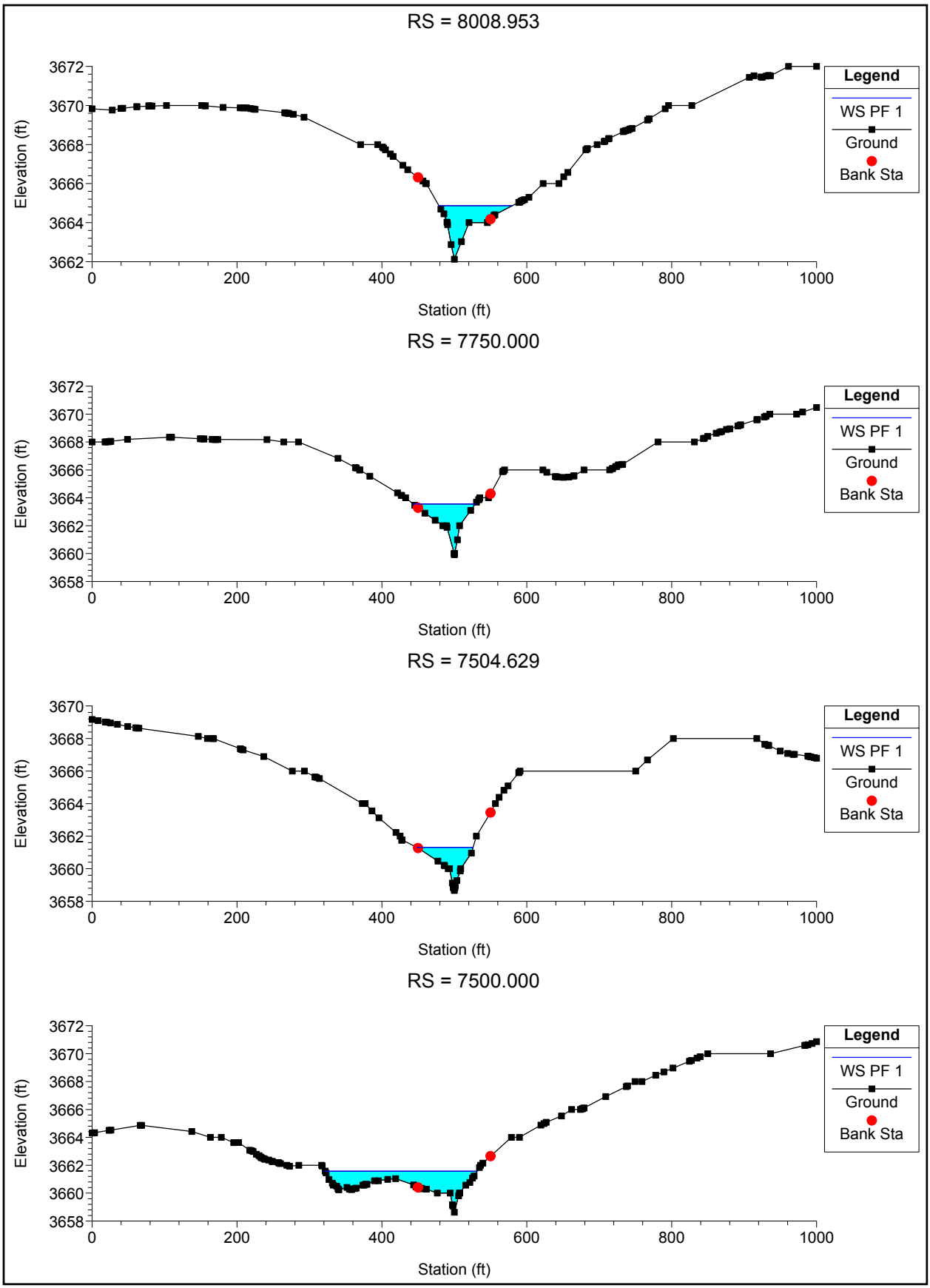
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 8008.953
Elevation (ft)
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3670
3668
3666
3664
3662
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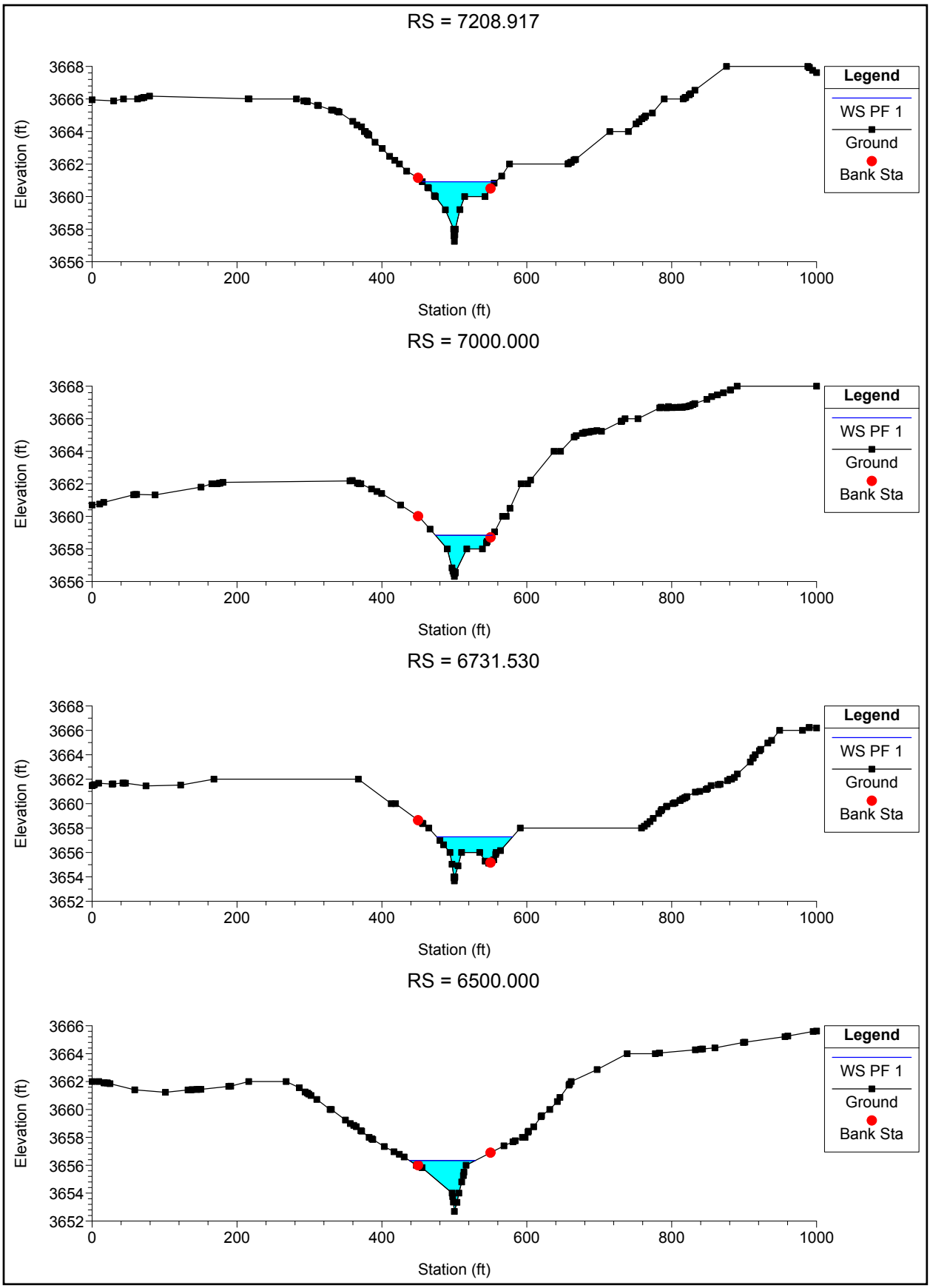
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7750.000
Elevation (ft)
3672
3670
3668
3666
3664
3662
3660
3658
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7504.629
Elevation (ft)
3670
3668
3666
3664
3662
3660
3658
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7500.000
Elevation (ft)
3672
3670
3668
3666
3664
3662
3660
3658
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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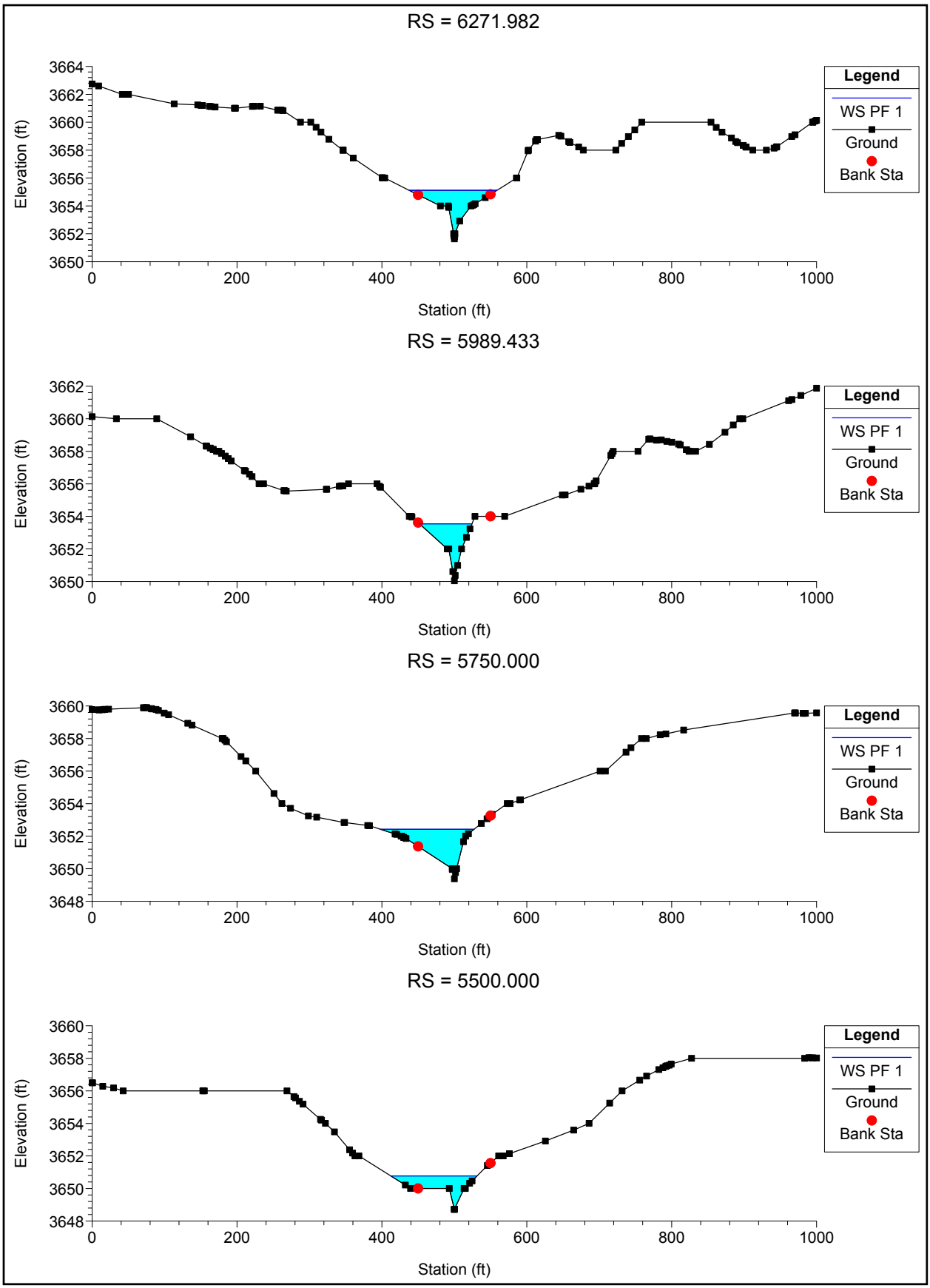
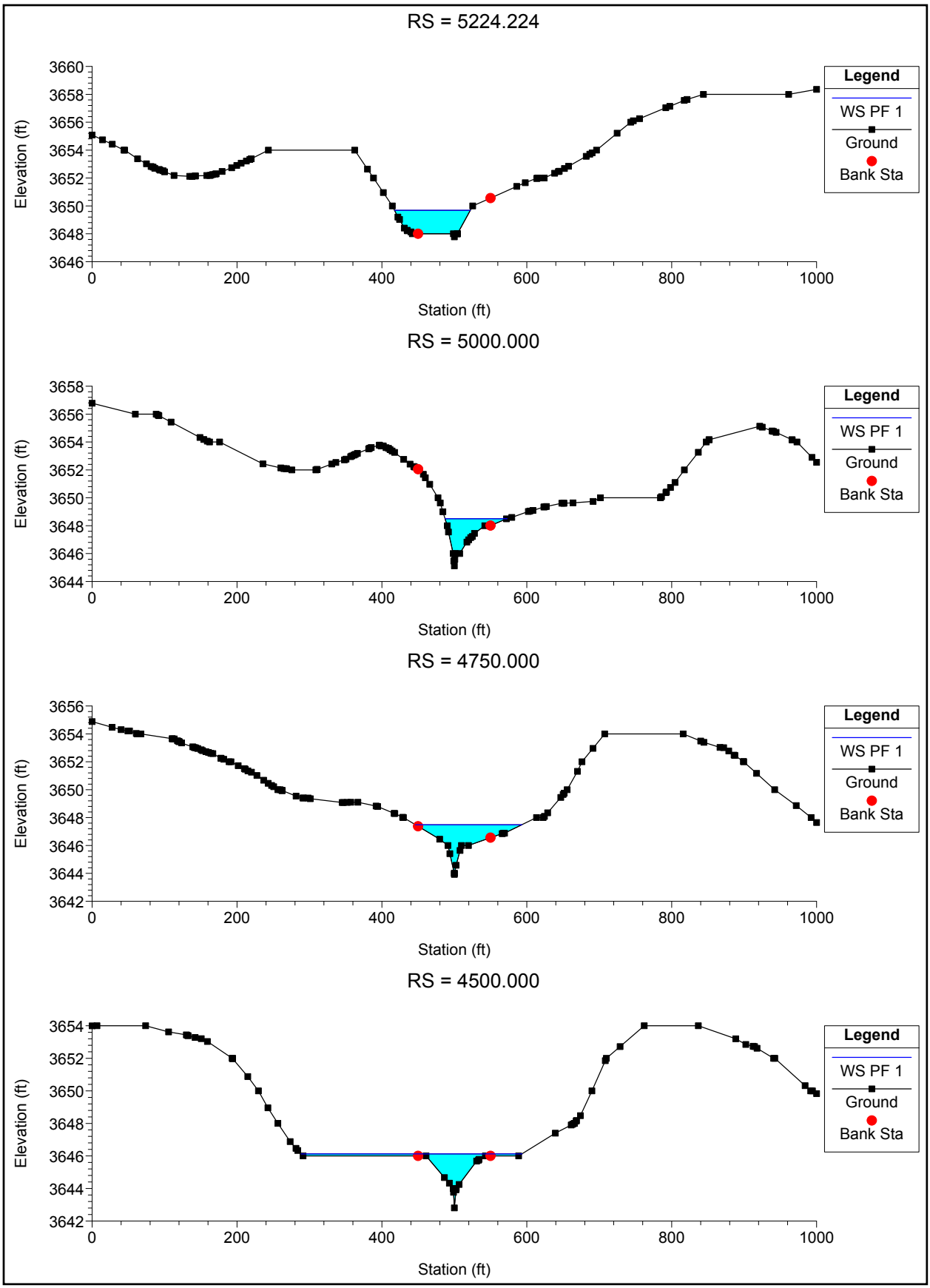
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6731.530
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 6271.982
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5989.433
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3656
3654
3652
3650
3648
3646
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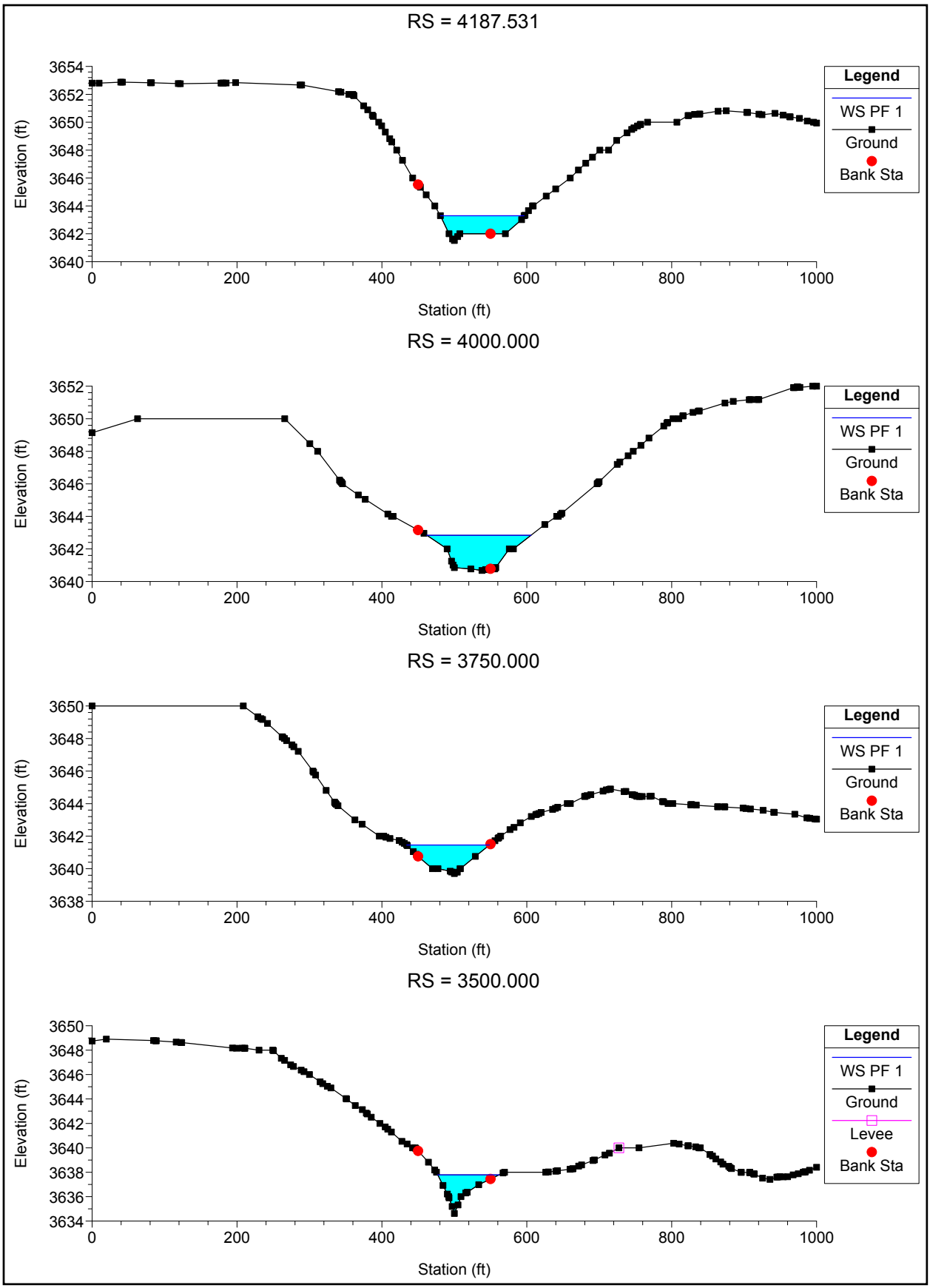
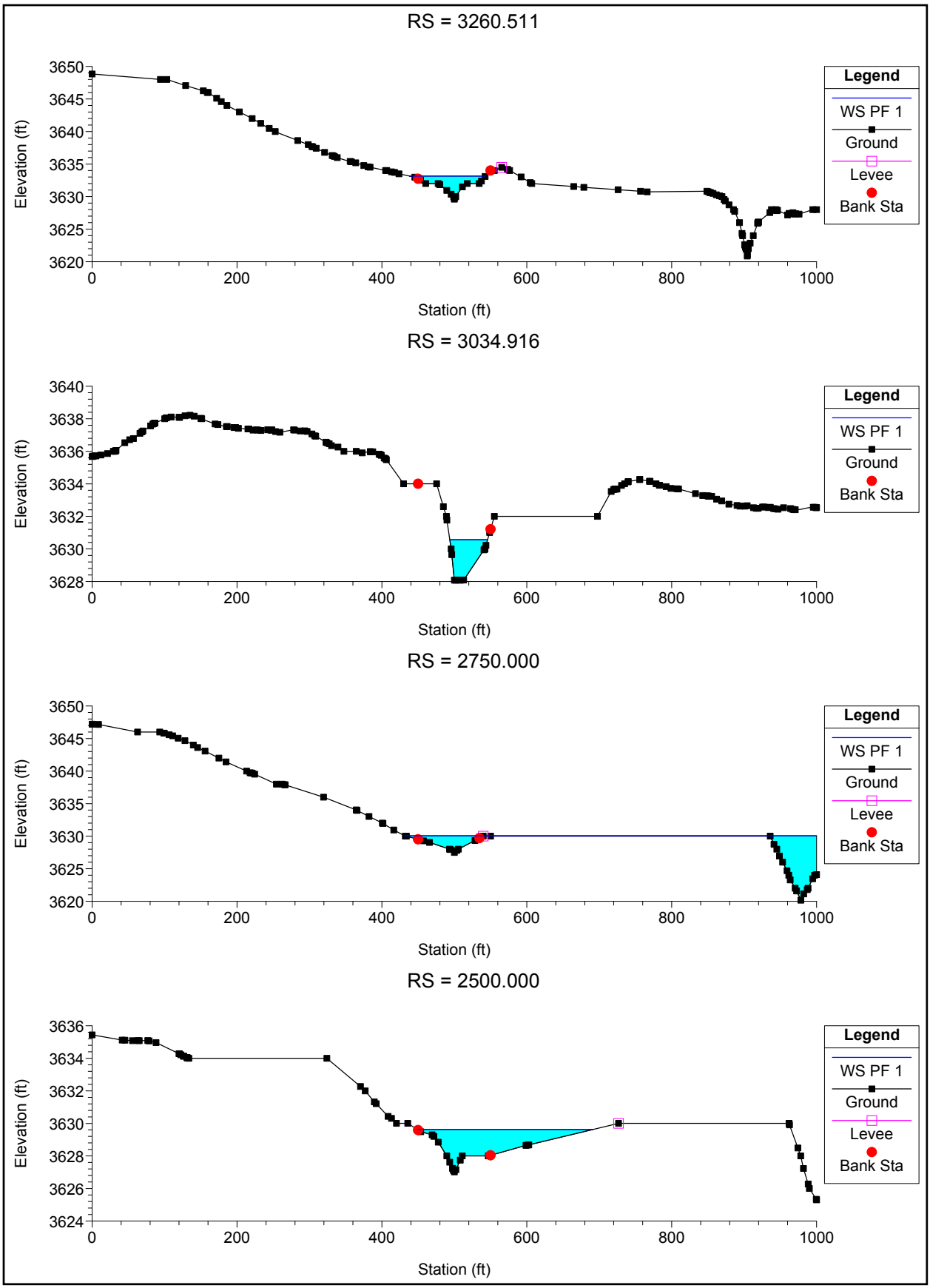
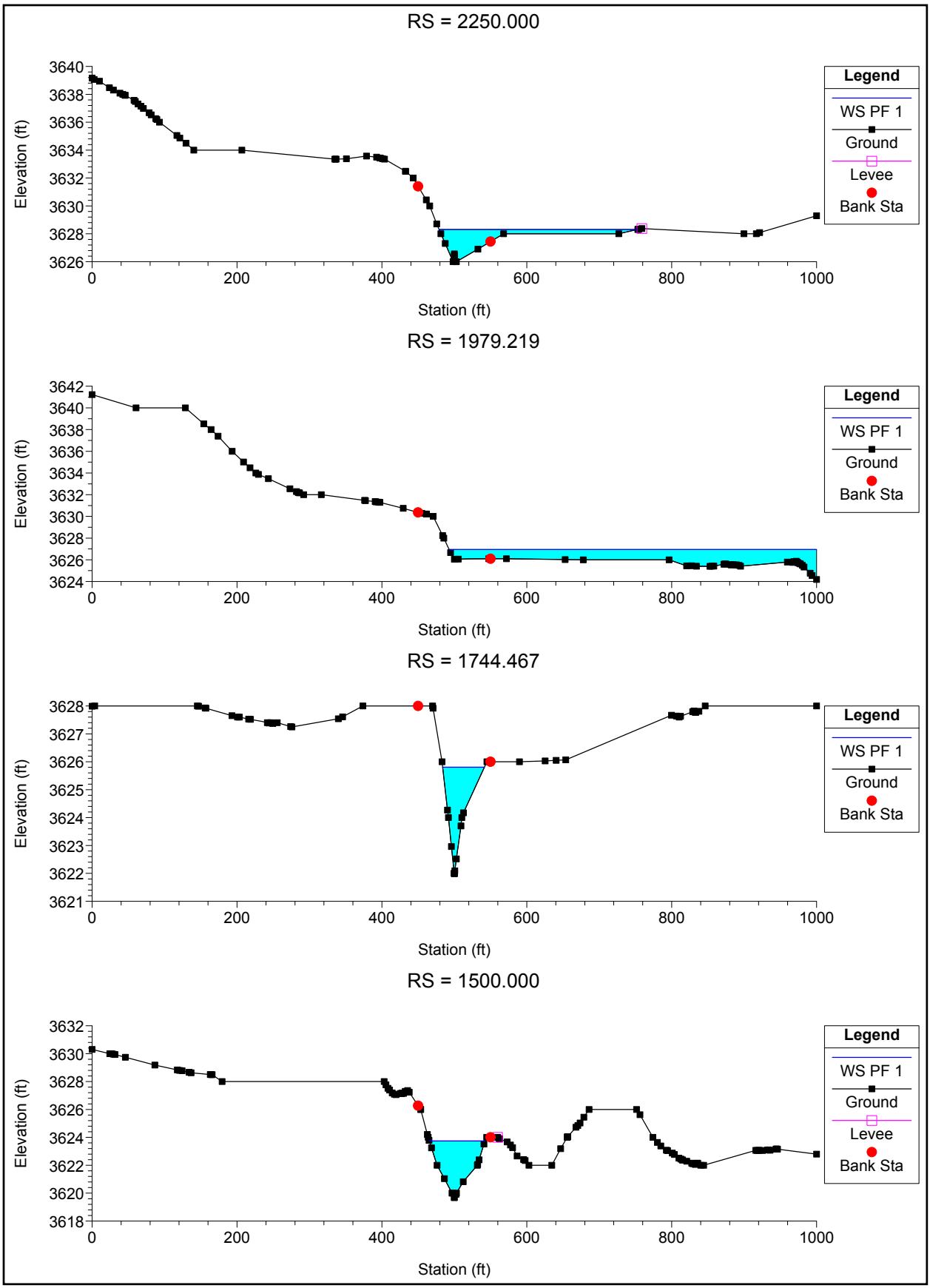
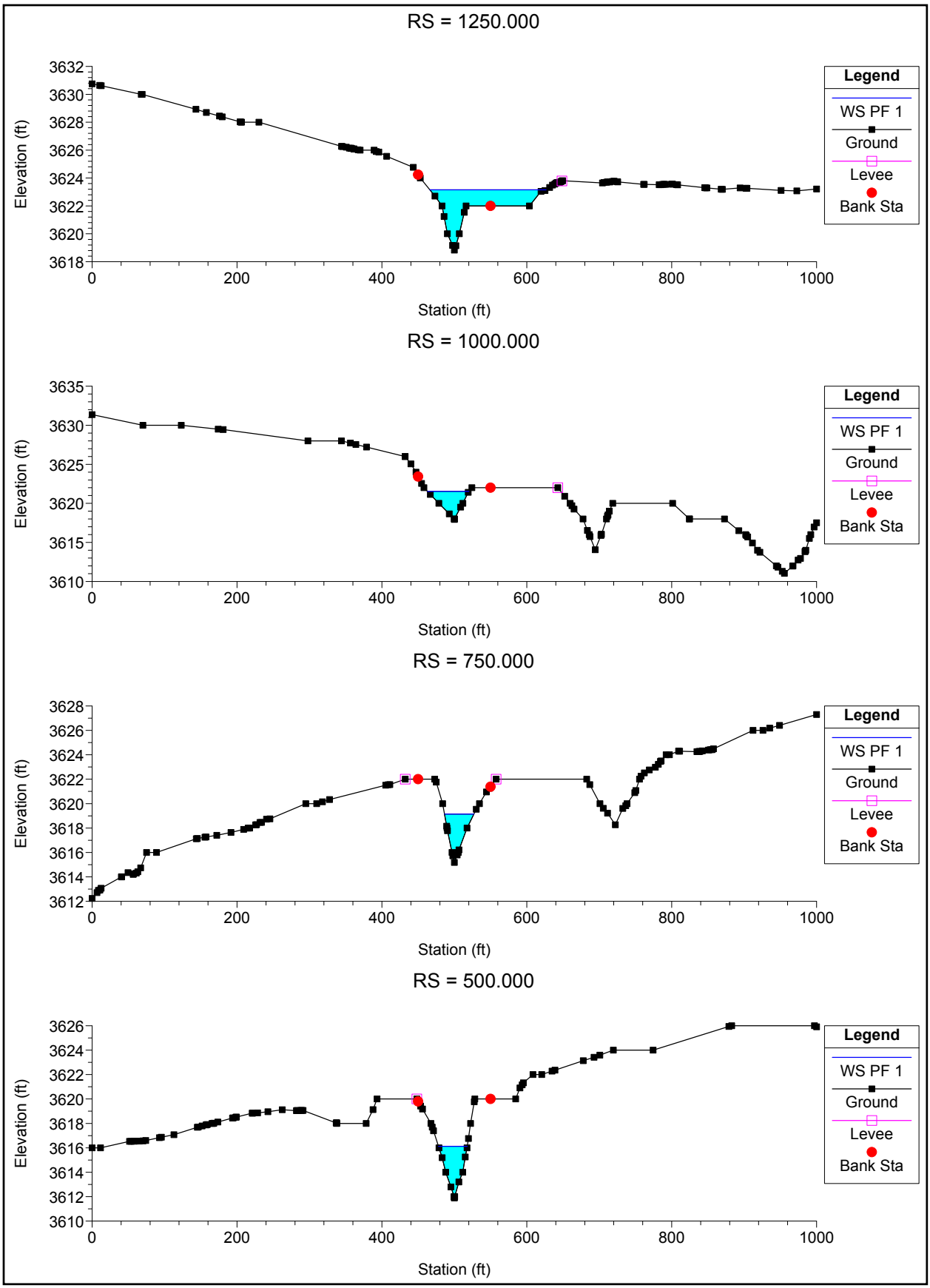
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
3658
3656
3654
3652
3650
3648
3646
3644
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4750.000
Elevation (ft)
3656
3654
3652
3650
3648
3646
3644
3642
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4500.000
Elevation (ft)
3654
3652
3650
3648
3646
3644
3642
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 4187.531
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 3260.511
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3034.916
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 2250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1979.219
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1744.467
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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3626
3624
3622
3620
3618
0
200
400
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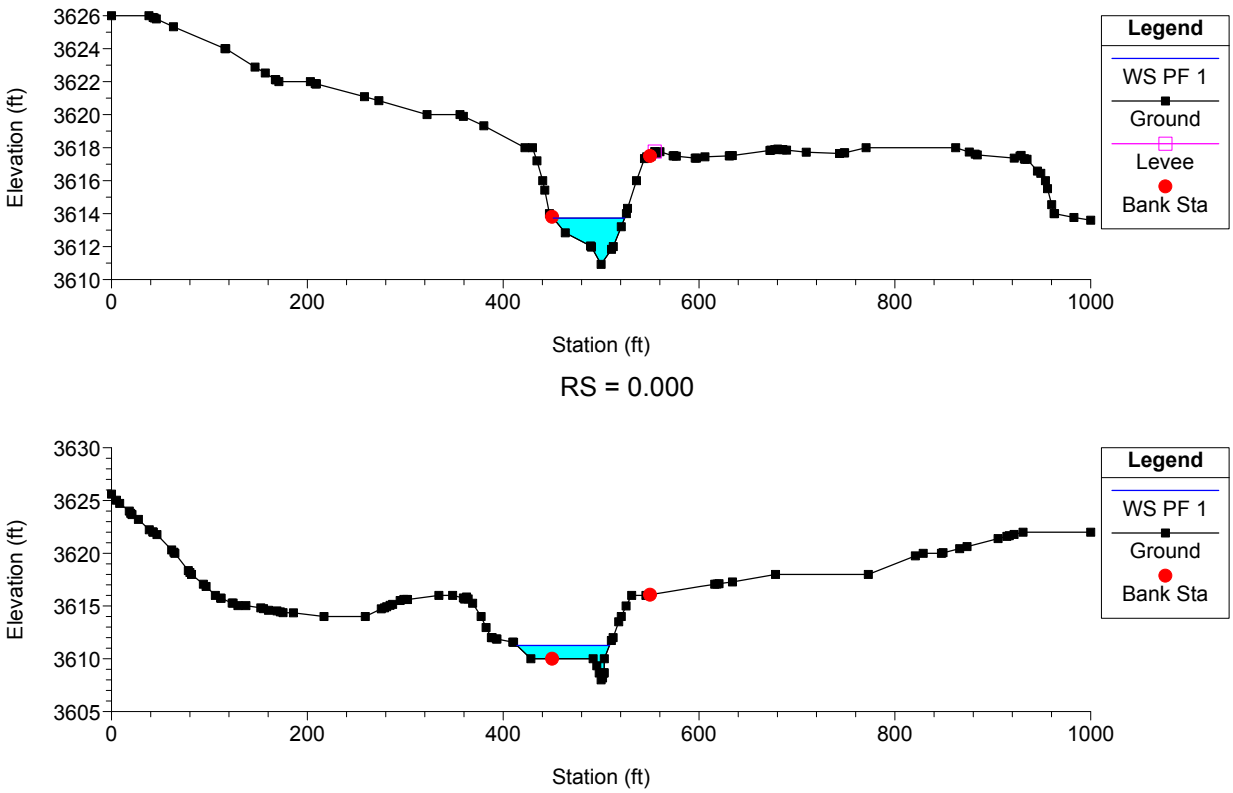
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
3635
3630
3625
3620
3615
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3628
3626
3624
3622
3620
3618
3616
3614
3612
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
3626
3624
3622
3620
3618
3616
3614
3612
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

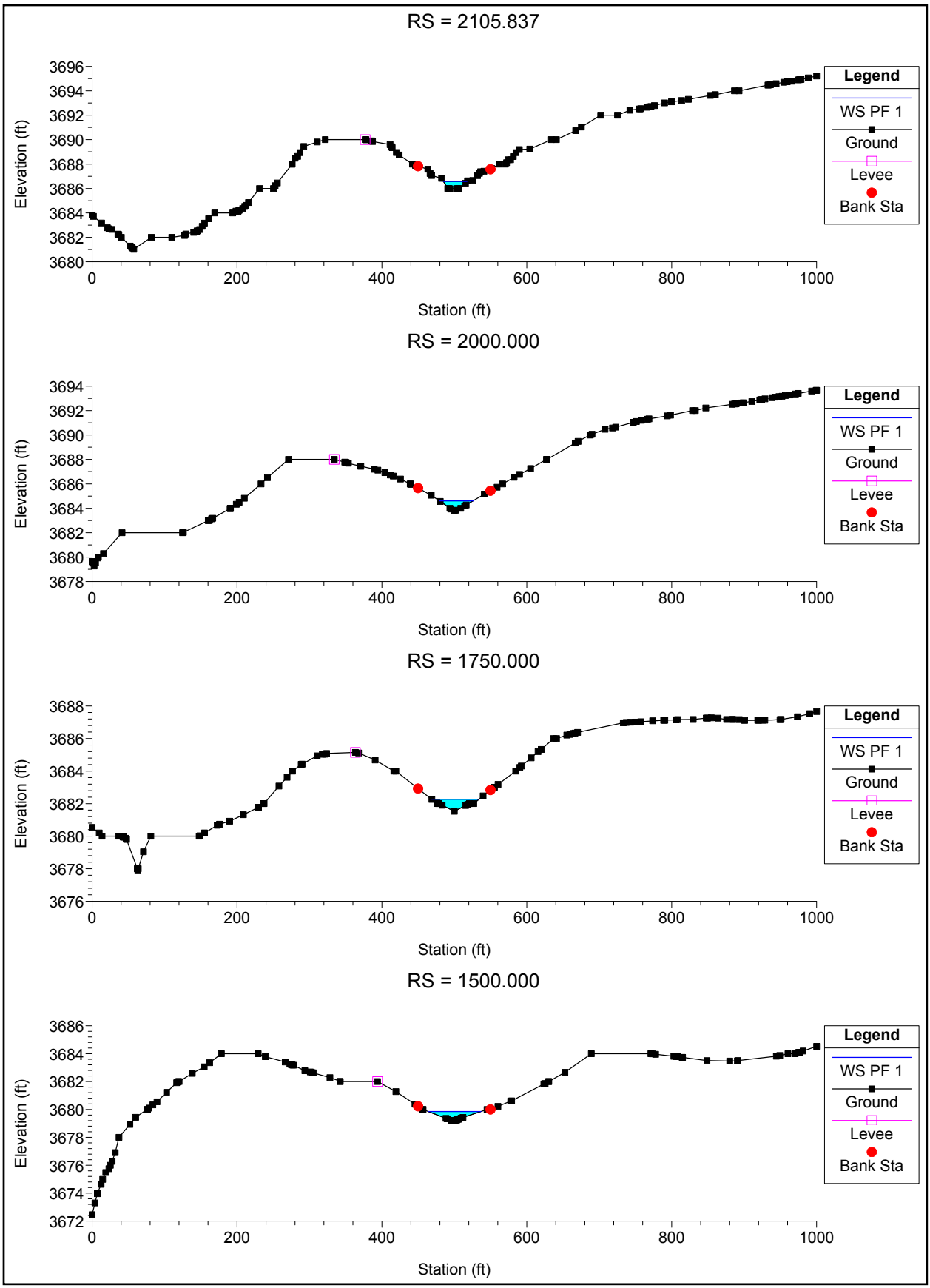

RS = 250.000
Elevation (ft)
3626
3624
3622
3620
3618
3616
3614
3612
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

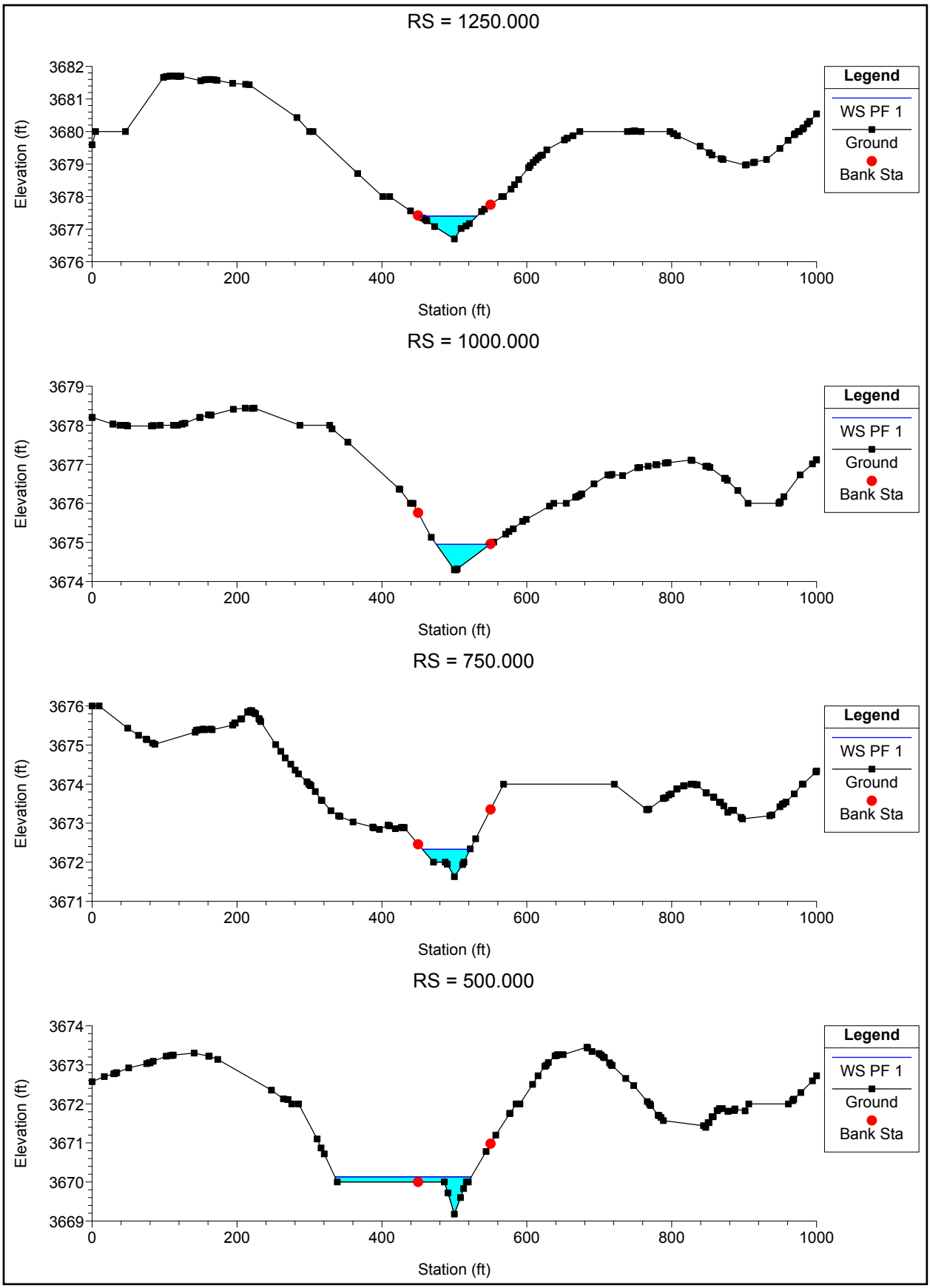

RS = 0.000
Elevation (ft)
3630
3625
3620
3615
3610
3605
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-15

# HEC-RAS Channel 09B

| 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) | |
| 09B | 2105.837 | PF 1 | 54 | 3685.98 | 3686.58 | 3686.58 | 3686.8 | 0.023943 | 3.79 | 14.24 | 32.45 | 1.01 |
| 09B | 2000 | PF 1 | 54 | 3683.8 | 3684.61 | 3684.5 | 3684.72 | 0.011641 | 2.64 | 20.45 | 46.7 | 0.7 |
| 09B | 1750 | PF 1 | 54 | 3681.53 | 3682.27 | 3682.14 | 3682.34 | 0.008691 | 2.11 | 25.57 | 65.56 | 0.6 |
| 09B | 1500 | PF 1 | 54 | 3679.17 | 3679.86 | 3679.75 | 3679.93 | 0.010872 | 2.17 | 24.94 | 72.88 | 0.65 |
| 09B | 1250 | PF 1 | 54 | 3676.7 | 3677.4 | 3677.27 | 3677.46 | 0.009593 | 2.01 | 26.82 | 79.57 | 0.61 |
| 09B | 1000 | PF 1 | 54 | 3674.3 | 3674.95 | | 3675.02 | 0.011032 | 2.16 | 25.03 | 74.37 | 0.66 |
| 09B | 750 | PF 1 | 54 | 3671.63 | 3672.33 | 3672.25 | 3672.42 | 0.013353 | 2.4 | 22.51 | 65.79 | 0.72 |
| 09B | 500 | PF 1 | 54 | 3669.18 | 3670.13 | 3670.09 | 3670.17 | 0.008989 | 1.78 | 36.56 | 188.39 | 0.58 |
| 09B | 250 | PF 1 | 54 | 3665.94 | 3667.23 | 3667.23 | 3667.51 | 0.021981 | 4.2 | 12.85 | 23.38 | 1 |
| 09B | 0 | PF 1 | 54 | 3662.53 | 3663.82 | 3663.66 | 3663.98 | 0.011002 | 3.3 | 16.34 | 25.45 | 0.73 |


RS = 2105.837
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
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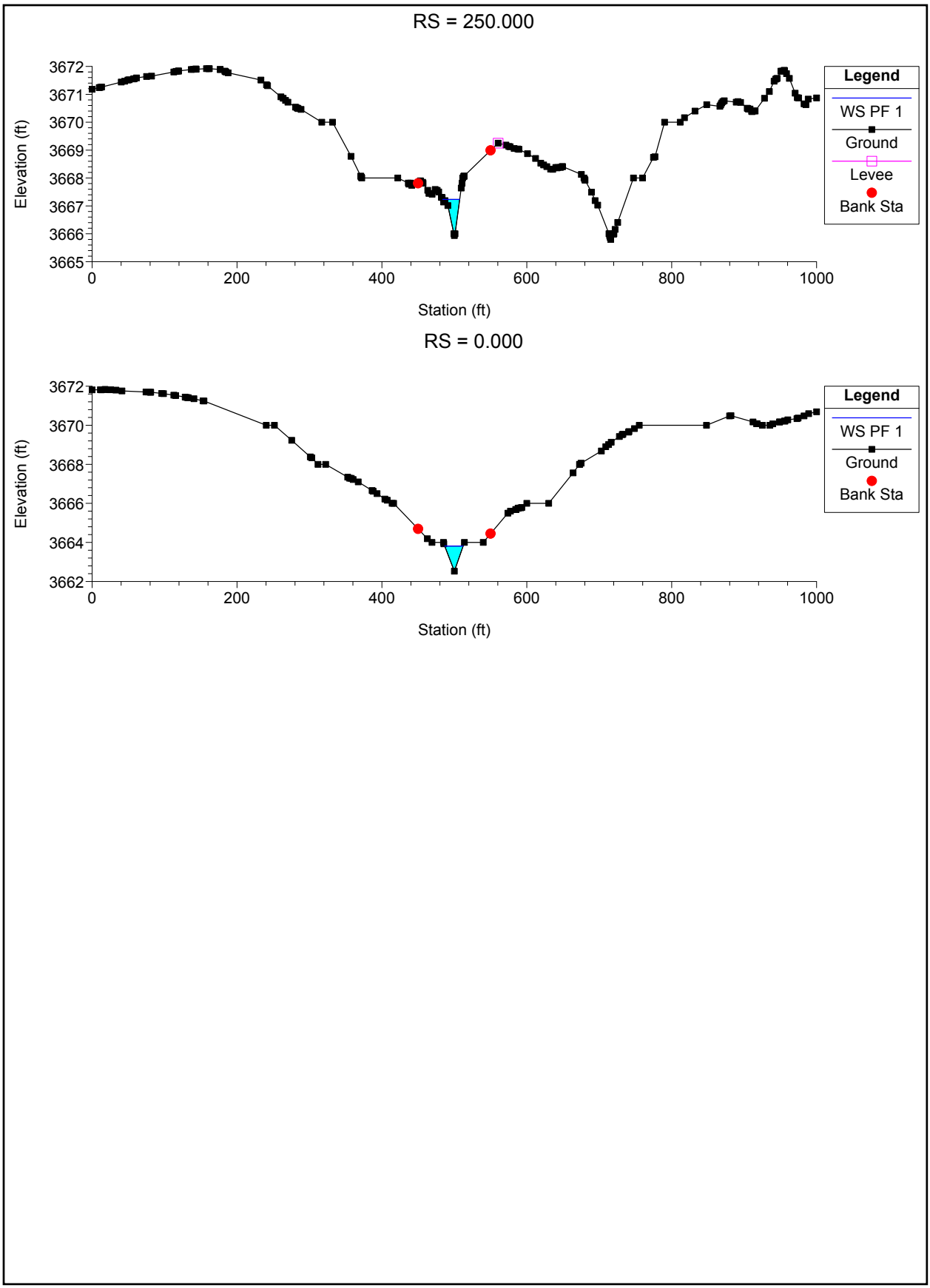
3681
3680
3679
3678
3677
3676
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3679
3678
3677
3676
3675
3674
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
3676
3675
3674
3673
3672
3671
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
3674
3673
3672
3671
3670
3669
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 250.000
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3672
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3667
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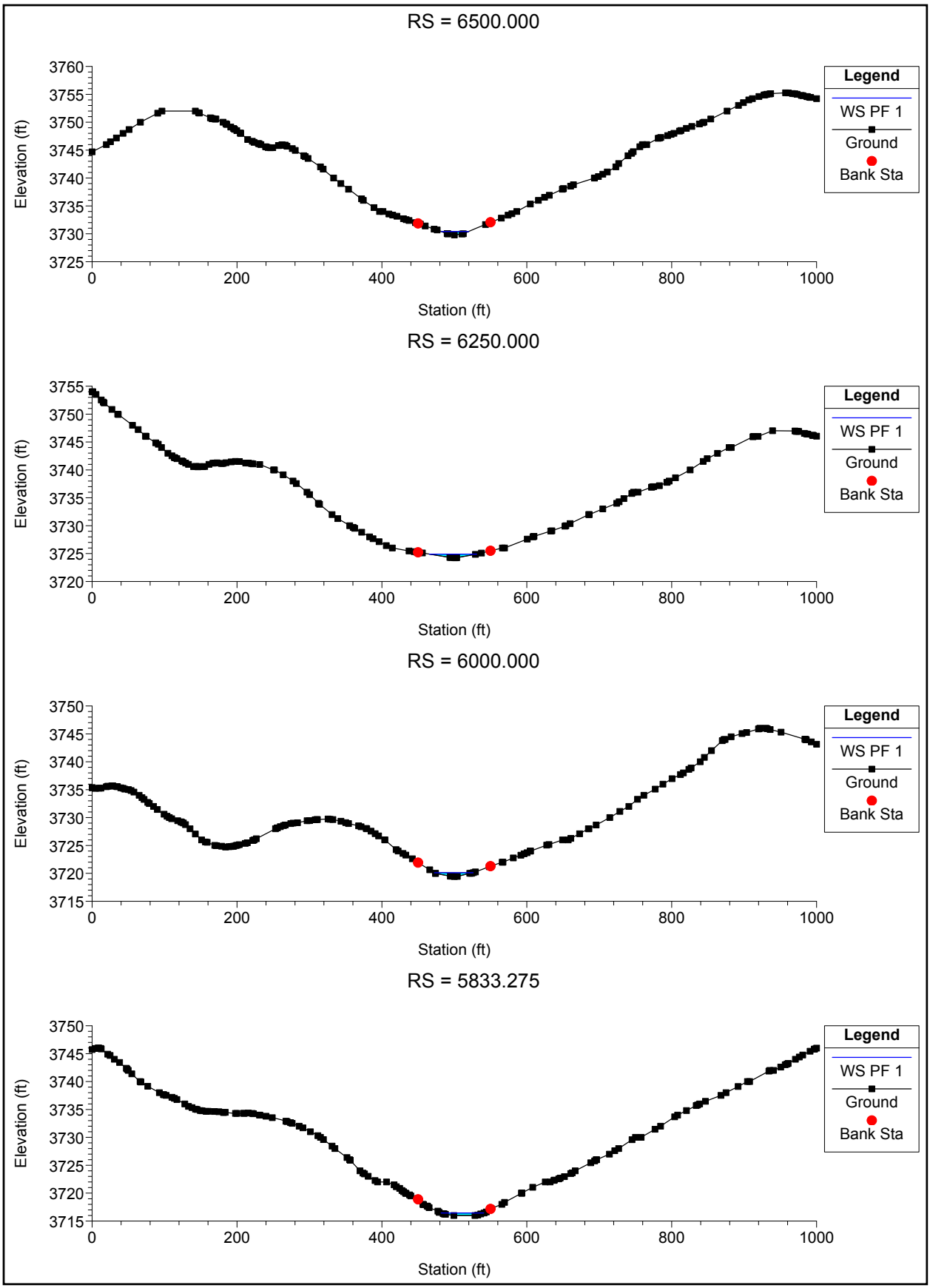
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3672
3670
3668
3666
3664
3662
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-16

# HEC-RAS Channel 09C

| 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) | |
| 09C | 6500 | PF 1 | 68 | 3729.8 | 3730.42 | 3730.5 | 3730.76 | 0.043992 | 4.69 | 14.51 | 37.98 | 1.34 |
| 09C | 6250 | PF 1 | 68 | 3724.25 | 3724.91 | 3724.85 | 3725.03 | 0.017589 | 2.86 | 23.76 | 65.56 | 0.84 |
| 09C | 6000 | PF 1 | 68 | 3719.43 | 3720.11 | 3720.09 | 3720.28 | 0.021069 | 3.28 | 20.75 | 53.47 | 0.93 |
| 09C | 5833.275 | PF 1 | 68 | 3716 | 3716.44 | 3716.44 | 3716.61 | 0.025206 | 3.32 | 20.45 | 59.02 | 1 |
| 09C | 5512.271 | PF 1 | 68 | 3706.11 | 3707.01 | 3707.13 | 3707.48 | 0.037027 | 5.49 | 12.39 | 22.41 | 1.3 |
| 09C | 5244.041 | PF 1 | 68 | 3701.33 | 3702.65 | 3702.33 | 3702.73 | 0.005111 | 2.26 | 30.03 | 46.51 | 0.5 |
| 09C | 5000 | PF 1 | 376 | 3696.1 | 3699.03 | 3699.03 | 3699.48 | 0.018864 | 5.38 | 69.83 | 78.3 | 1 |
| 09C | 4750 | PF 1 | 376 | 3692.64 | 3694.41 | 3694.44 | 3694.7 | 0.022604 | 4.72 | 88.75 | 172.18 | 1.04 |
| 09C | 4543.542 | PF 1 | 376 | 3689.13 | 3690.72 | 3690.72 | 3691.01 | 0.017944 | 4.81 | 91.26 | 157.66 | 0.96 |
| 09C | 4253.038 | PF 1 | 376 | 3683.7 | 3684.94 | 3685 | 3685.42 | 0.025948 | 5.56 | 67.66 | 92.82 | 1.14 |
| 09C | 4000 | PF 1 | 376 | 3680.09 | 3681.3 | 3681.3 | 3681.59 | 0.014522 | 4.72 | 92.53 | 151.02 | 0.88 |
| 09C | 3750 | PF 1 | 376 | 3675.39 | 3677.83 | 3677.69 | 3678.22 | 0.012006 | 4.97 | 76.1 | 75.21 | 0.83 |
| 09C | 3500 | PF 1 | 376 | 3672.66 | 3674.44 | 3674.44 | 3674.8 | 0.018396 | 4.83 | 79.26 | 112.14 | 0.97 |
| 09C | 3279.988 | PF 1 | 376 | 3668.93 | 3670.75 | 3670.73 | 3671.11 | 0.016354 | 4.83 | 80.09 | 109.79 | 0.93 |
| 09C | 3017.288 | PF 1 | 376 | 3665.61 | 3667.34 | 3667.34 | 3667.71 | 0.014791 | 4.99 | 80.83 | 110.98 | 0.9 |
| 09C | 2750 | PF 1 | 376 | 3662.39 | 3663.83 | 3663.78 | 3664.14 | 0.013746 | 4.59 | 86.57 | 113.64 | 0.86 |
| 09C | 2500 | PF 1 | 376 | 3659.85 | 3660.64 | 3660.61 | 3660.85 | 0.015591 | 3.98 | 110.02 | 230.73 | 0.87 |
| 09C | 2259.345 | PF 1 | 376 | 3656.1 | 3657.29 | 3657.29 | 3657.65 | 0.017879 | 4.86 | 79.07 | 109.82 | 0.96 |
| 09C | 2250 | PF 1 | 376 | 3652 | 3652.36 | 3653 | 3656.84 | 0.729111 | 16.98 | 22.15 | 69.08 | 5.28 |
| 09C | 2012.023 | PF 1 | 376 | 3652.39 | 3653.25 | 3653.25 | 3653.25 | 0.000042 | 0.17 | 905.63 | 524.56 | 0.04 |
| 09C | 1756.216 | PF 1 | 376 | 3647.22 | 3648.36 | 3649.03 | 3652.77 | 0.608047 | 16.84 | 22.32 | 61.41 | 4.92 |
| 09C | 1500 | PF 1 | 376 | 3643.7 | 3645.9 | 3645.9 | 3646.25 | 0.012105 | 4.88 | 85.01 | 139.62 | 0.83 |
| 09C | 1250 | PF 1 | 376 | 3641.43 | 3642.72 | 3642.47 | 3642.82 | 0.006083 | 2.52 | 147.59 | 218.64 | 0.54 |
| 09C | 1000 | PF 1 | 376 | 3639.47 | 3640.5 | 3640.44 | 3640.68 | 0.014168 | 3.61 | 112.53 | 211.62 | 0.82 |
| 09C | 750 | PF 1 | 376 | 3637.19 | 3638.5 | | 3638.65 | 0.006248 | 3.29 | 123.89 | 148.69 | 0.59 |
| 09C | 560.628 | PF 1 | 376 | 3635.63 | 3636.48 | 3636.48 | 3636.74 | 0.020006 | 4.33 | 94.56 | 184.01 | 0.97 |
| 09C | 250 | PF 1 | 376 | 3633.55 | 3634.93 | 3634.22 | 3634.96 | 0.000857 | 1.35 | 310.25 | 336.04 | 0.22 |
| 09C | 0 | PF 1 | 376 | 3632 | 3633.93 | 3633.93 | 3634.41 | 0.016656 | 5.61 | 68.4 | 73.15 | 0.97 |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3735
3730
3725
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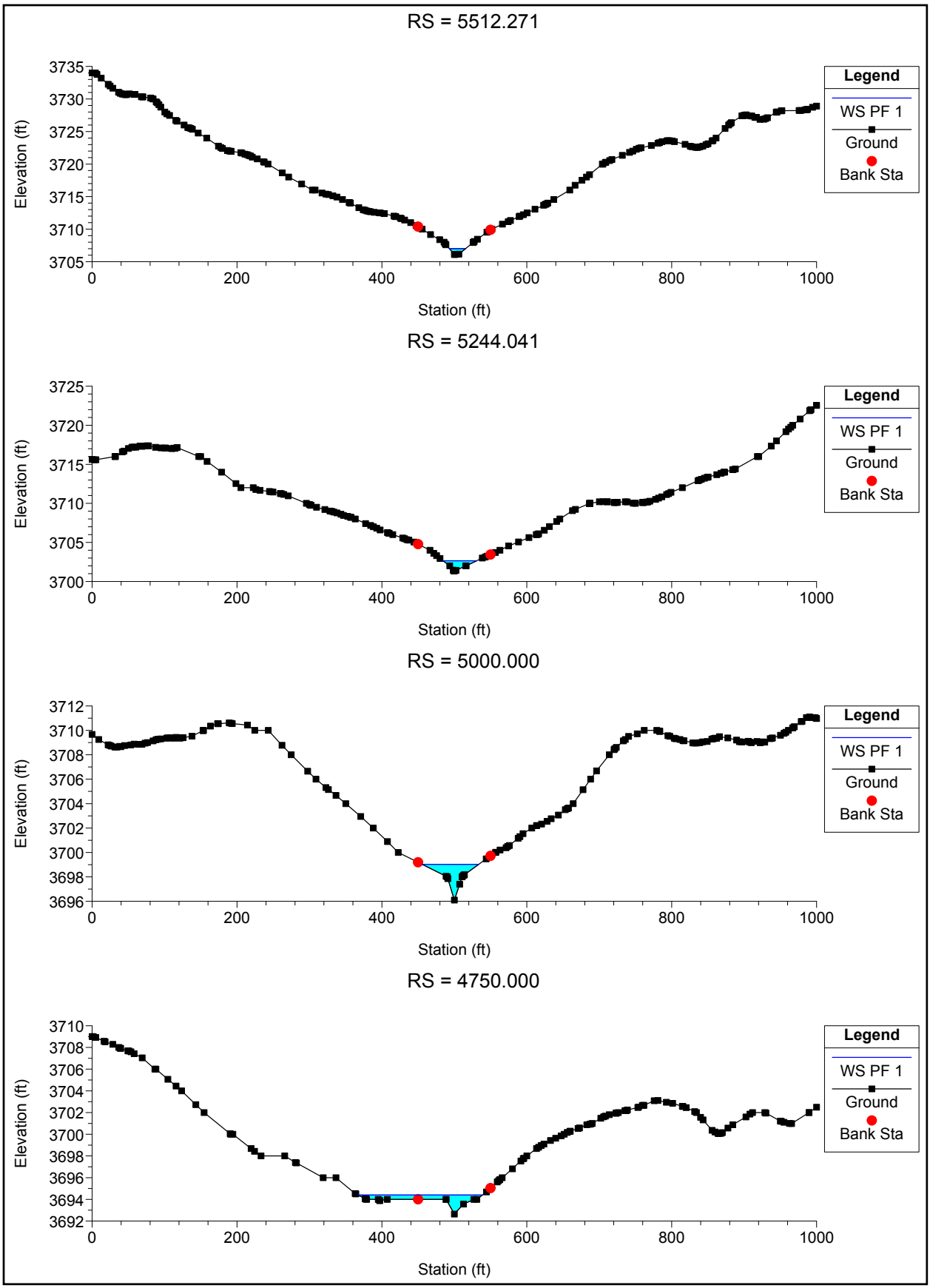
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6250.000
Elevation (ft)
3755
3750
3745
3740
3735
3730
3725
3720
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6000.000
Elevation (ft)
3750
3745
3740
3735
3730
3725
3720
3715
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5833.275
Elevation (ft)
3750
3745
3740
3735
3730
3725
3720
3715
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 5512.271
Elevation (ft)
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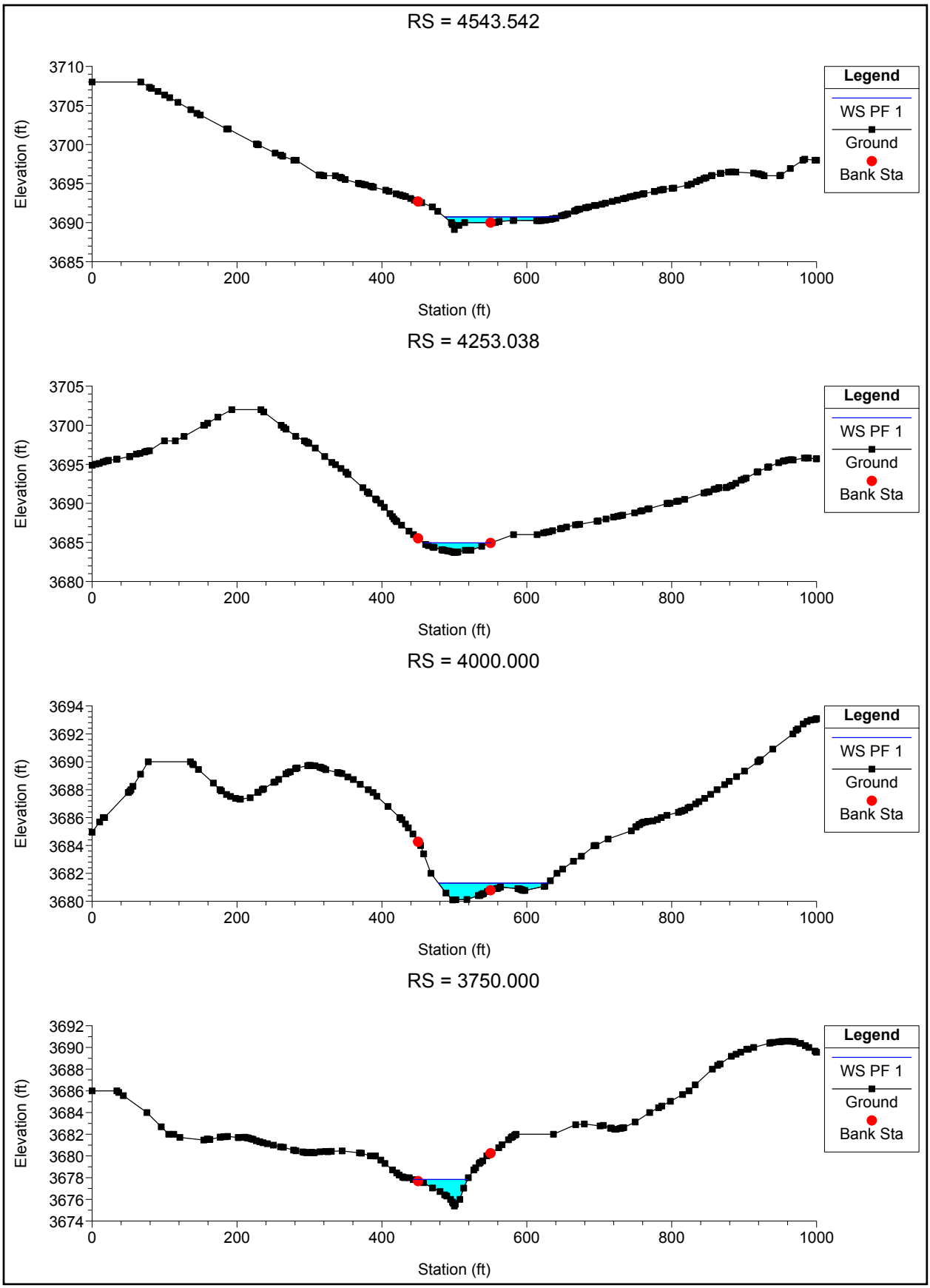
3730
3725
3720
3715
3710
3705
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5244.041
Elevation (ft)
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
3712
3710
3708
3706
3704
3702
3700
3698
3696
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4750.000
Elevation (ft)
3710
3708
3706
3704
3702
3700
3698
3696
3694
3692
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 4543.542
Elevation (ft)
3710
3705
3700
3695
3690
3685
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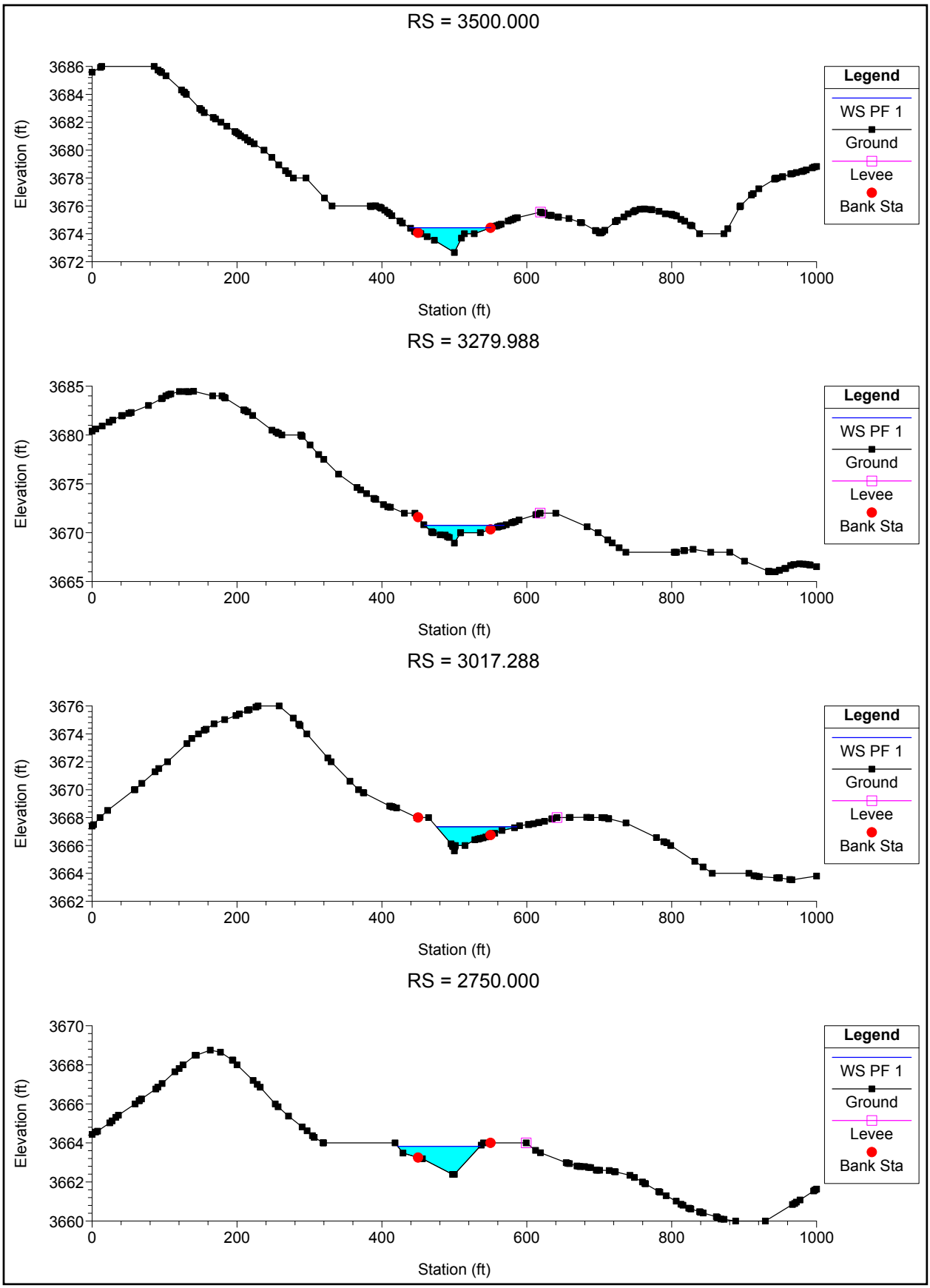
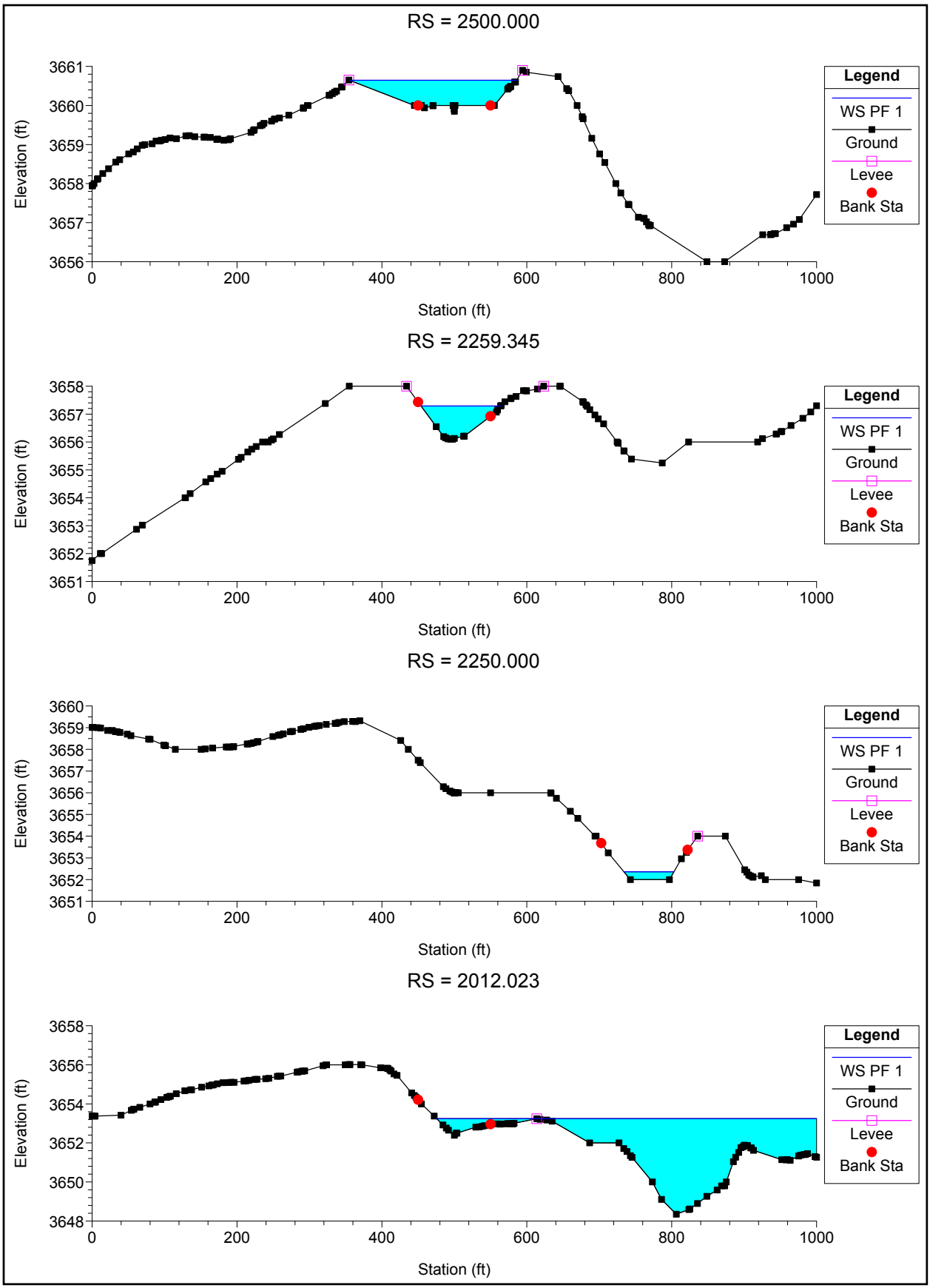
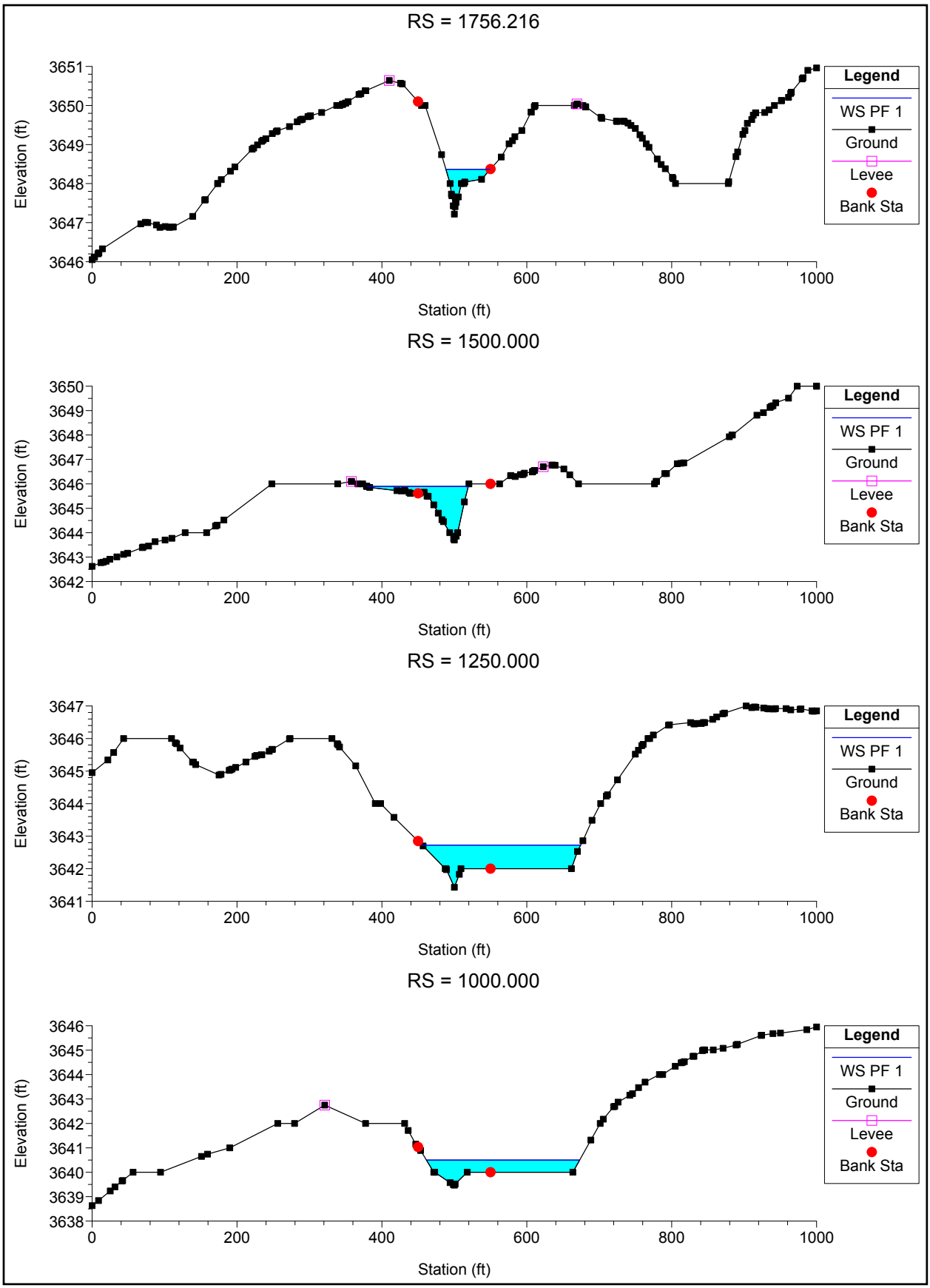
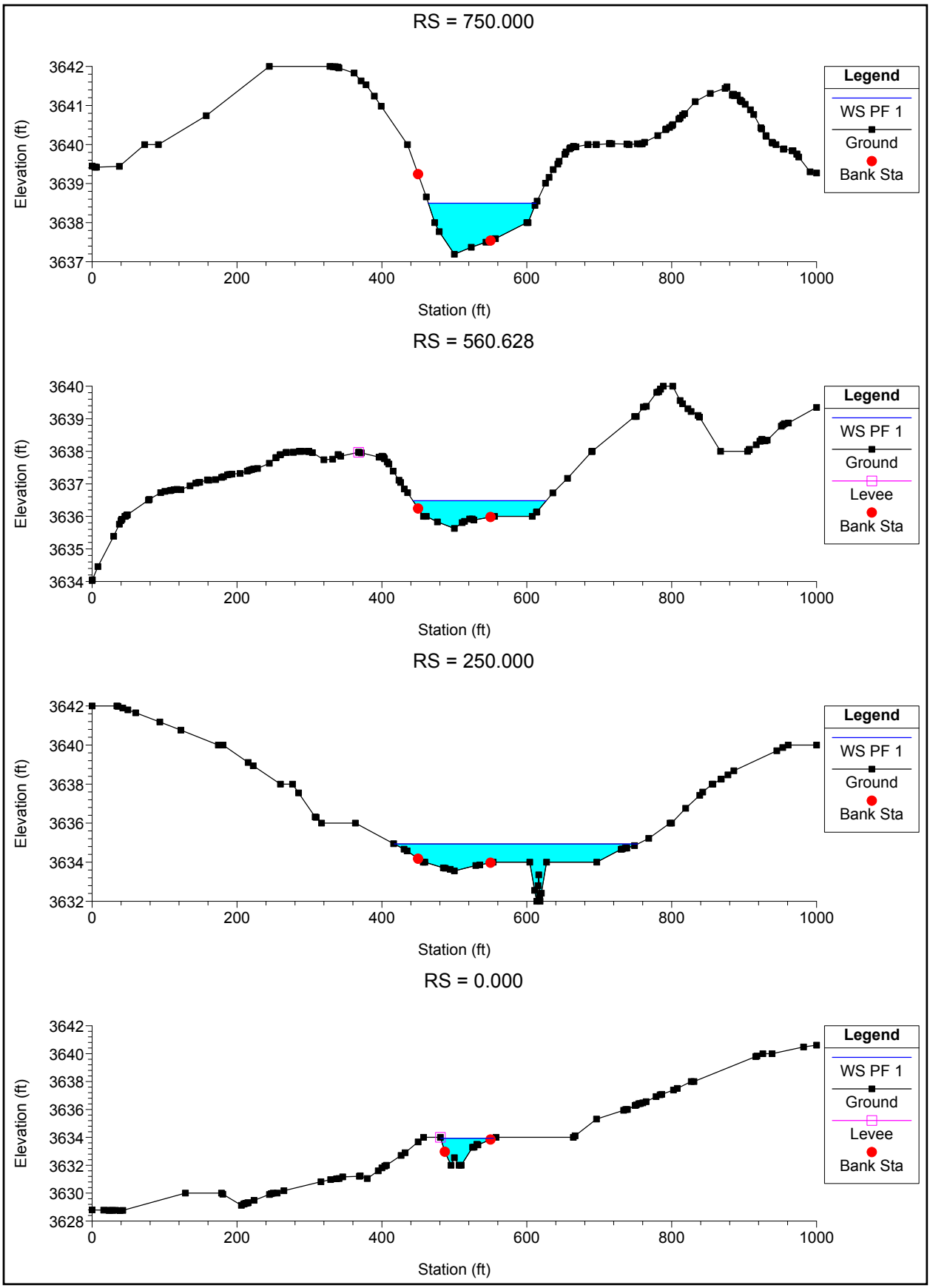
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4253.038
Elevation (ft)
3705
3700
3695
3690
3685
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4000.000
Elevation (ft)
3694
3692
3690
3688
3686
3684
3682
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
3692
3690
3688
3686
3684
3682
3680
3678
3676
3674
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 3500.000
Elevation (ft)
3686
3684
3682
3680
3678
3676
3674
3672
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3279.988
Elevation (ft)
3685
3680
3675
3670
3665
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3017.288
Elevation (ft)
3676
3674
3672
3670
3668
3666
3664
3662
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2750.000
Elevation (ft)
3670
3668
3666
3664
3662
3660
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 2500.000
Elevation (ft)
3661
3660
3659
3658
3657
3656
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2259.345
Elevation (ft)
3658
3657
3656
3655
3654
3653
3652
3651
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2250.000
Elevation (ft)
3660
3659
3658
3657
3656
3655
3654
3653
3652
3651
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2012.023
Elevation (ft)
3658
3656
3654
3652
3650
3648
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

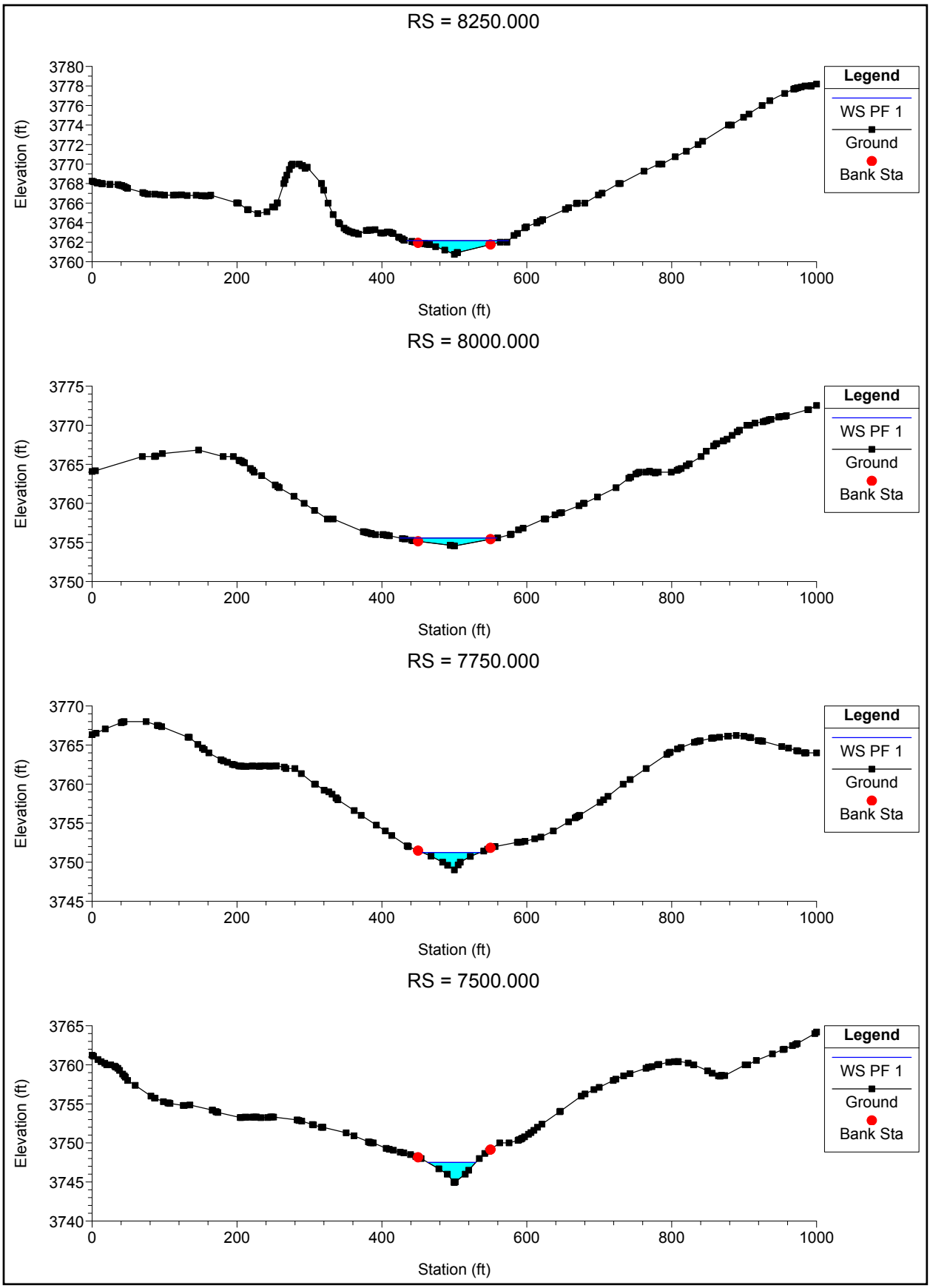

RS = 1756.216
Elevation (ft)
3651
3650
3649
3648
3647
3646
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1500.000
Elevation (ft)
3650
3649
3648
3647
3646
3645
3644
3643
3642
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1250.000
Elevation (ft)
3647
3646
3645
3644
3643
3642
3641
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3646
3645
3644
3643
3642
3641
3640
3639
3638
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

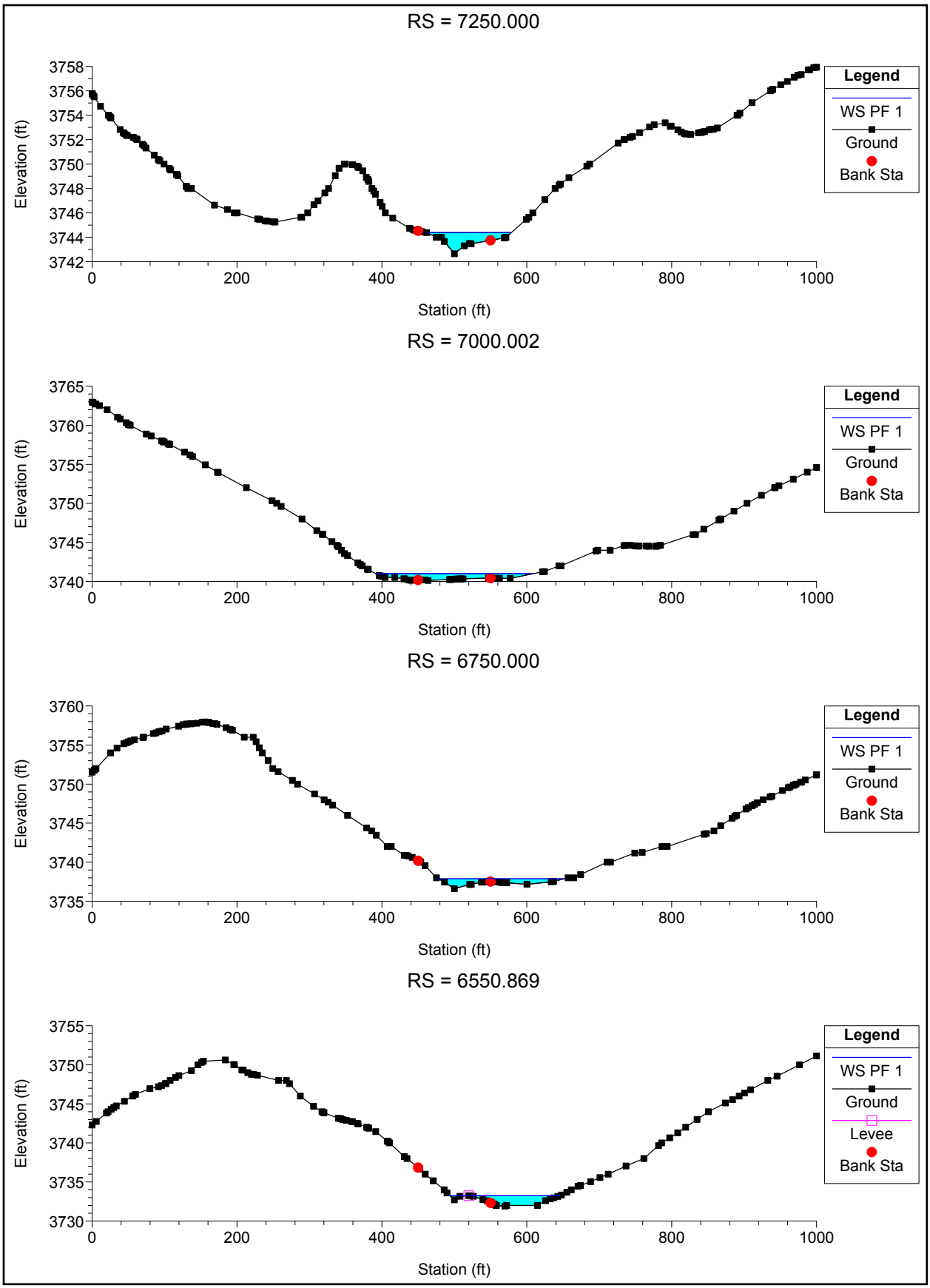

RS = 750.000
Elevation (ft)
3642
3641
3640
3639
3638
3637
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 560.628
Elevation (ft)
3640
3639
3638
3637
3636
3635
3634
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3642
3640
3638
3636
3634
3632
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 0.000
Elevation (ft)
3642
3640
3638
3636
3634
3632
3630
3628
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

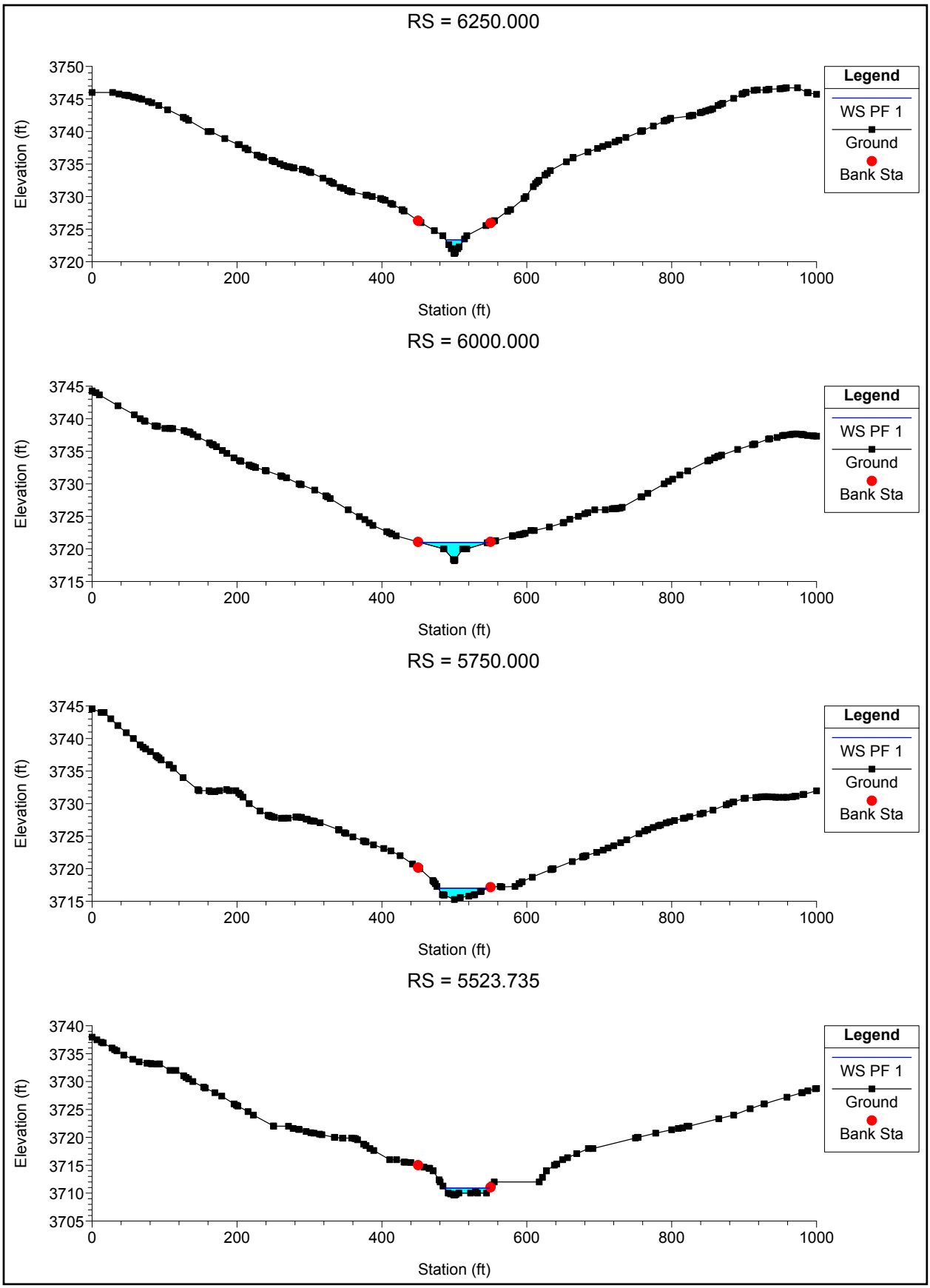
# Attachment 2.7-M-17

# HEC-RAS Channel 09D

| 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) | |
| 09D | 8250 | PF 1 | 409 | 3760.75 | 3762.16 | 3762.2 | 3762.55 | 0.020022 | 5.08 | 84.86 | 140.47 | 1.02 |
| 09D | 8000 | PF 1 | 409 | 3754.55 | 3755.56 | 3755.72 | 3756.12 | 0.036943 | 6.08 | 70.63 | 134.07 | 1.34 |
| 09D | 7750 | PF 1 | 409 | 3749.02 | 3751.24 | 3751.24 | 3751.72 | 0.01899 | 5.55 | 73.67 | 79.56 | 1.02 |
| 09D | 7500 | PF 1 | 409 | 3744.92 | 3747.51 | 3747.28 | 3747.9 | 0.010552 | 5 | 81.81 | 66.42 | 0.79 |
| 09D | 7250 | PF 1 | 409 | 3742.65 | 3744.39 | 3744.39 | 3744.75 | 0.017122 | 4.94 | 87.21 | 117.5 | 0.95 |
| 09D | 7000.002 | PF 1 | 409 | 3740.14 | 3741 | 3740.88 | 3741.16 | 0.01074 | 3.5 | 128.88 | 216.97 | 0.73 |
| 09D | 6750 | PF 1 | 409 | 3736.61 | 3737.88 | 3737.88 | 3738.16 | 0.01997 | 4.64 | 98.24 | 174.11 | 0.99 |
| 09D | 6550.869 | PF 1 | 409 | 3732.32 | 3733.25 | 3733.25 | 3733.48 | 0.008591 | 1.68 | 112.22 | 151.68 | 0.56 |
| 09D | 6250 | PF 1 | 409 | 3721.25 | 3723.35 | 3724.42 | 3727.12 | 0.129936 | 15.59 | 26.23 | 25.14 | 2.69 |
| 09D | 6000 | PF 1 | 409 | 3718.18 | 3721 | 3720.9 | 3721.35 | 0.013913 | 4.72 | 86.6 | 94.25 | 0.87 |
| 09D | 5750 | PF 1 | 409 | 3715.27 | 3716.99 | 3716.99 | 3717.52 | 0.018072 | 5.81 | 70.38 | 68.35 | 1.01 |
| 09D | 5523.735 | PF 1 | 409 | 3709.69 | 3710.91 | 3711.15 | 3711.8 | 0.039093 | 7.57 | 54 | 62.82 | 1.44 |
| 09D | 5250 | PF 1 | 409 | 3706.4 | 3708.08 | 3707.84 | 3708.39 | 0.008863 | 4.46 | 92.8 | 83.26 | 0.72 |
| 09D | 5000 | PF 1 | 409 | 3703.42 | 3704.9 | 3704.9 | 3705.35 | 0.018312 | 5.36 | 77.34 | 90.5 | 0.99 |
| 09D | 4750 | PF 1 | 409 | 3697.29 | 3700.14 | 3700.17 | 3700.78 | 0.018774 | 6.46 | 63.35 | 53.68 | 1.05 |
| 09D | 4500 | PF 1 | 409 | 3692.66 | 3696.01 | 3695.5 | 3696.28 | 0.006126 | 4.17 | 98.12 | 69.39 | 0.62 |
| 09D | 4250 | PF 1 | 409 | 3690.7 | 3693.3 | 3693.3 | 3693.83 | 0.017781 | 5.84 | 70.02 | 66.46 | 1 |
| 09D | 4000 | PF 1 | 409 | 3688 | 3690.32 | 3689.49 | 3690.47 | 0.003438 | 3.1 | 131.89 | 96.6 | 0.46 |
| 09D | 3750.273 | PF 1 | 409 | 3688 | 3688.47 | 3688.47 | 3688.69 | 0.023016 | 3.91 | 109.49 | 254.03 | 1 |
| 09D | 3533.283 | PF 1 | 465 | 3680.76 | 3684.53 | 3684.31 | 3684.68 | 0.00495 | 3.42 | 170.57 | 250.97 | 0.54 |
| 09D | 3500 | PF 1 | 465 | 3680.45 | 3683.96 | 3683.69 | 3684.42 | 0.01031 | 5.45 | 85.34 | 59.51 | 0.8 |
| 09D | 3333.751 | PF 1 | 465 | 3678.59 | 3681.65 | 3681.65 | 3682.26 | 0.016729 | 6.25 | 74.4 | 60.83 | 1 |
| 09D | 3056.921 | PF 1 | 465 | 3674 | 3677.86 | 3677.38 | 3678.43 | 0.007894 | 6.06 | 76.73 | 36.43 | 0.74 |
| 09D | 2557.588 | PF 1 | 465 | 3671.54 | 3674.66 | 3674.66 | 3675.16 | 0.015652 | 5.76 | 83.16 | 87.01 | 0.95 |
| 09D | 2306.763 | PF 1 | 465 | 3670.09 | 3671.03 | 3671.07 | 3671.51 | 0.02198 | 5.84 | 84.67 | 104.79 | 1.09 |
| 09D | 1960.609 | PF 1 | 465 | 3667.88 | 3669.8 | 3669.22 | 3669.99 | 0.00406 | 3.74 | 137.34 | 106.2 | 0.52 |
| 09D | 1812.084 | PF 1 | 465 | 3667.16 | 3668.6 | 3668.6 | 3668.97 | 0.014972 | 5.35 | 99.53 | 124.62 | 0.92 |
| 09D | 1604.585 | PF 1 | 465 | 3666 | 3667.19 | 3666.83 | 3667.3 | 0.003837 | 2.86 | 181.82 | 202.48 | 0.47 |
| 09D | 1500 | PF 1 | 465 | 3664 | 3666.33 | 3666.33 | 3666.59 | 0.014565 | 4.48 | 122.81 | 228.23 | 0.87 |
| 09D | 1250 | PF 1 | 465 | 3660.83 | 3664.04 | 3663.87 | 3664.37 | 0.008468 | 4.78 | 111 | 125.18 | 0.72 |
| 09D | 1000 | PF 1 | 465 | 3658.31 | 3661.42 | 3661.42 | 3661.92 | 0.017076 | 5.68 | 81.93 | 81.98 | 0.98 |
| 09D | 750 | PF 1 | 465 | 3654.27 | 3657.11 | 3657.29 | 3658.18 | 0.019664 | 8.3 | 56.02 | 33.47 | 1.13 |
| 09D | 481.154 | PF 1 | 465 | 3651.14 | 3655.01 | 3654.43 | 3655.52 | 0.00676 | 5.72 | 81.27 | 37.86 | 0.69 |
| 09D | 250 | PF 1 | 465 | 3650 | 3653.53 | 3653.07 | 3653.9 | 0.007479 | 4.84 | 96.13 | 63.07 | 0.69 |
| 09D | 0 | PF 1 | 465 | 3650 | 3651.32 | 3651.32 | 3651.67 | 0.011009 | 4.87 | 107.25 | 163.82 | 0.8 |


RS = 8250.000
Elevation (ft)
3780
3778
3776
3774
3772
3770
3768
3766
3764
3762
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 8000.000
Elevation (ft)
3775
3770
3765
3760
3755
3750
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7750.000
Elevation (ft)
3770
3765
3760
3755
3750
3745
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7500.000
Elevation (ft)
3765
3760
3755
3750
3745
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 7250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7000.002
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6550.869
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 6250.000
Elevation (ft)
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3745
3740
3735
3730
3725
3720
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6000.000
Elevation (ft)
3745
3740
3735
3730
3725
3720
3715
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5750.000
Elevation (ft)
3745
3740
3735
3730
3725
3720
3715
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5523.735
Elevation (ft)
3740
3735
3730
3725
3720
3715
3710
3705
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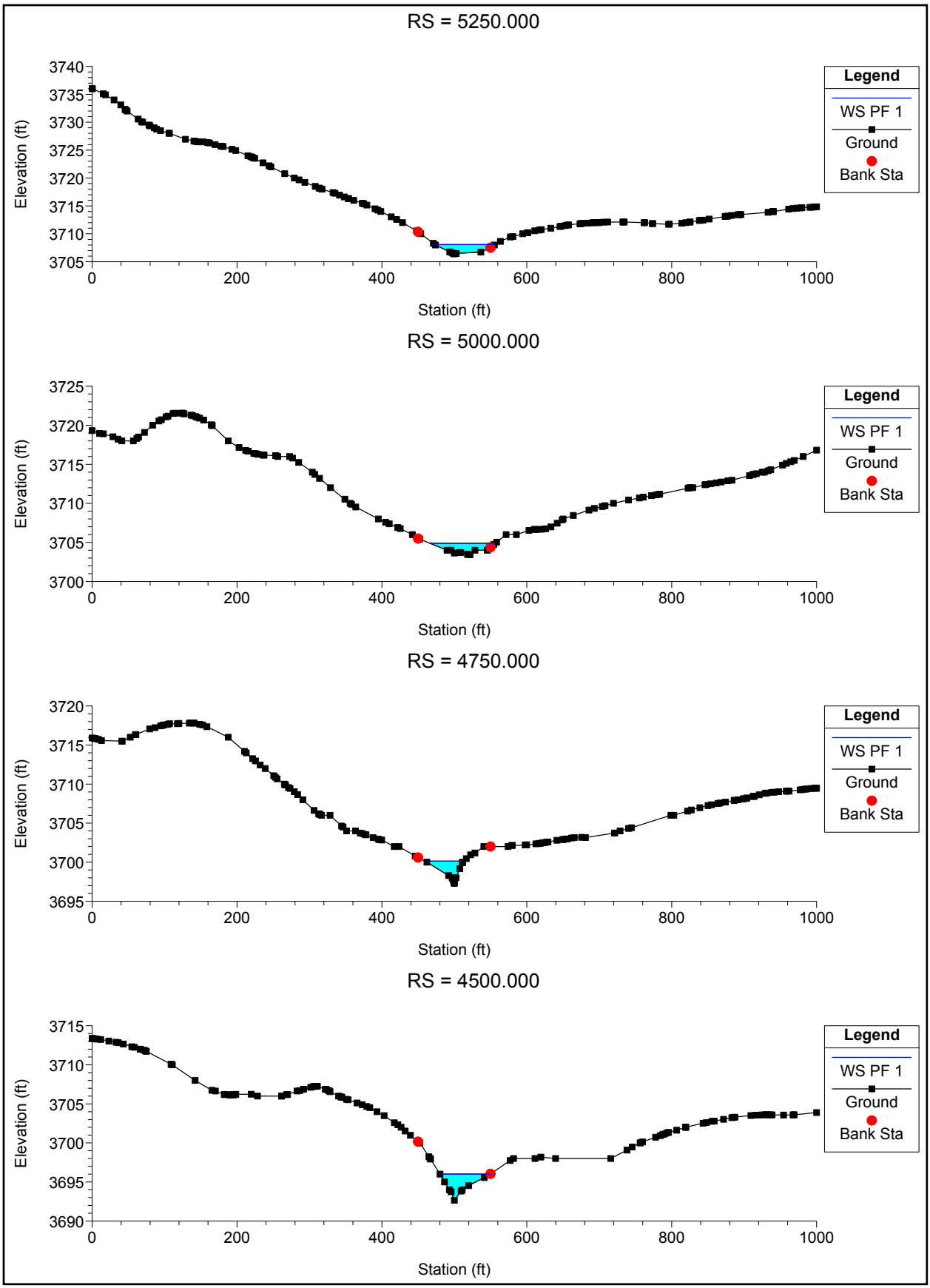
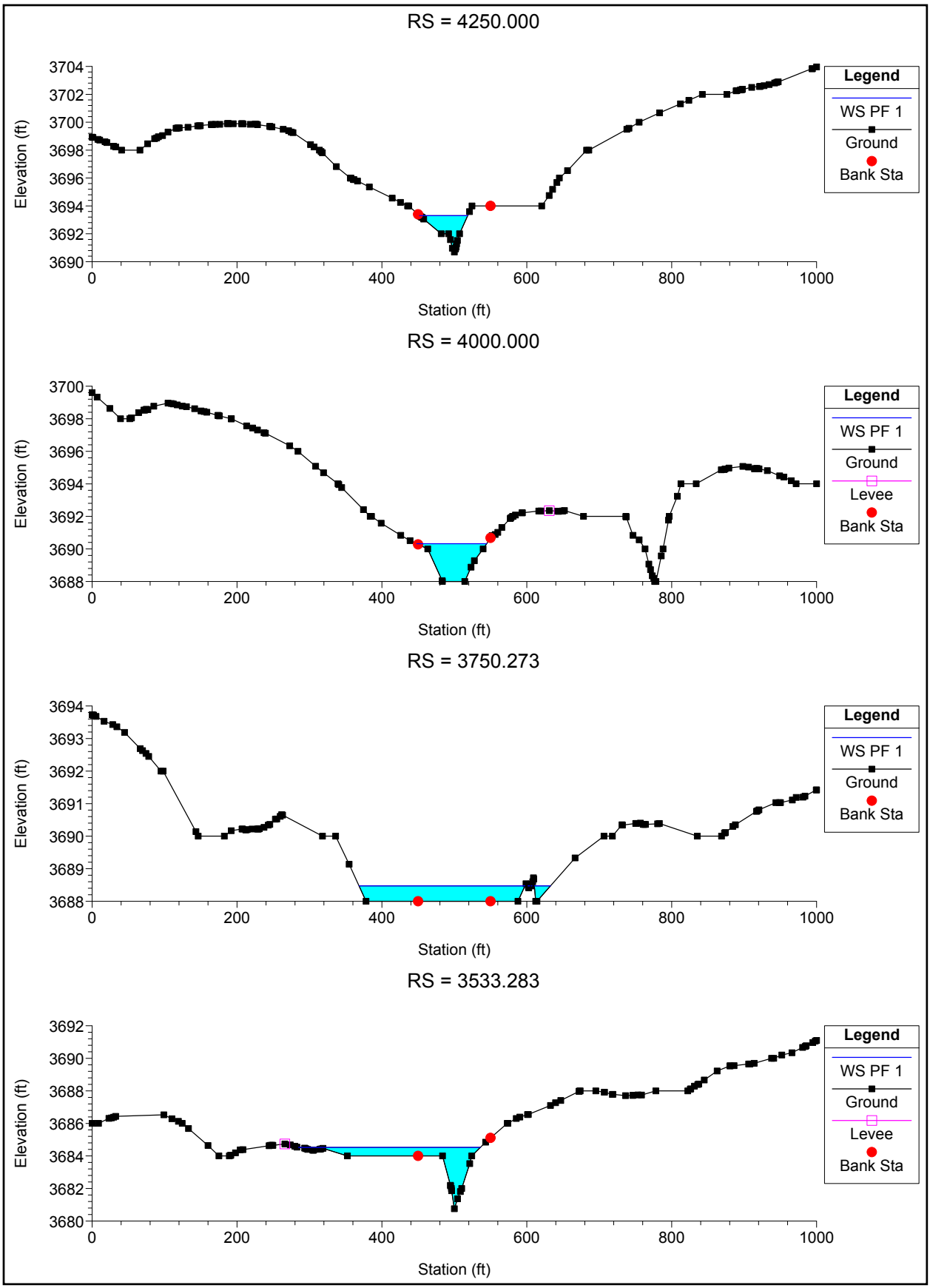
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 5250.000
Elevation (ft)
3740
3735
3730
3725
3720
3715
3710
3705
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4750.000
Elevation (ft)
3720
3715
3710
3705
3700
3695
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4500.000
Elevation (ft)
3715
3710
3705
3700
3695
3690
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 4250.000
Elevation (ft)
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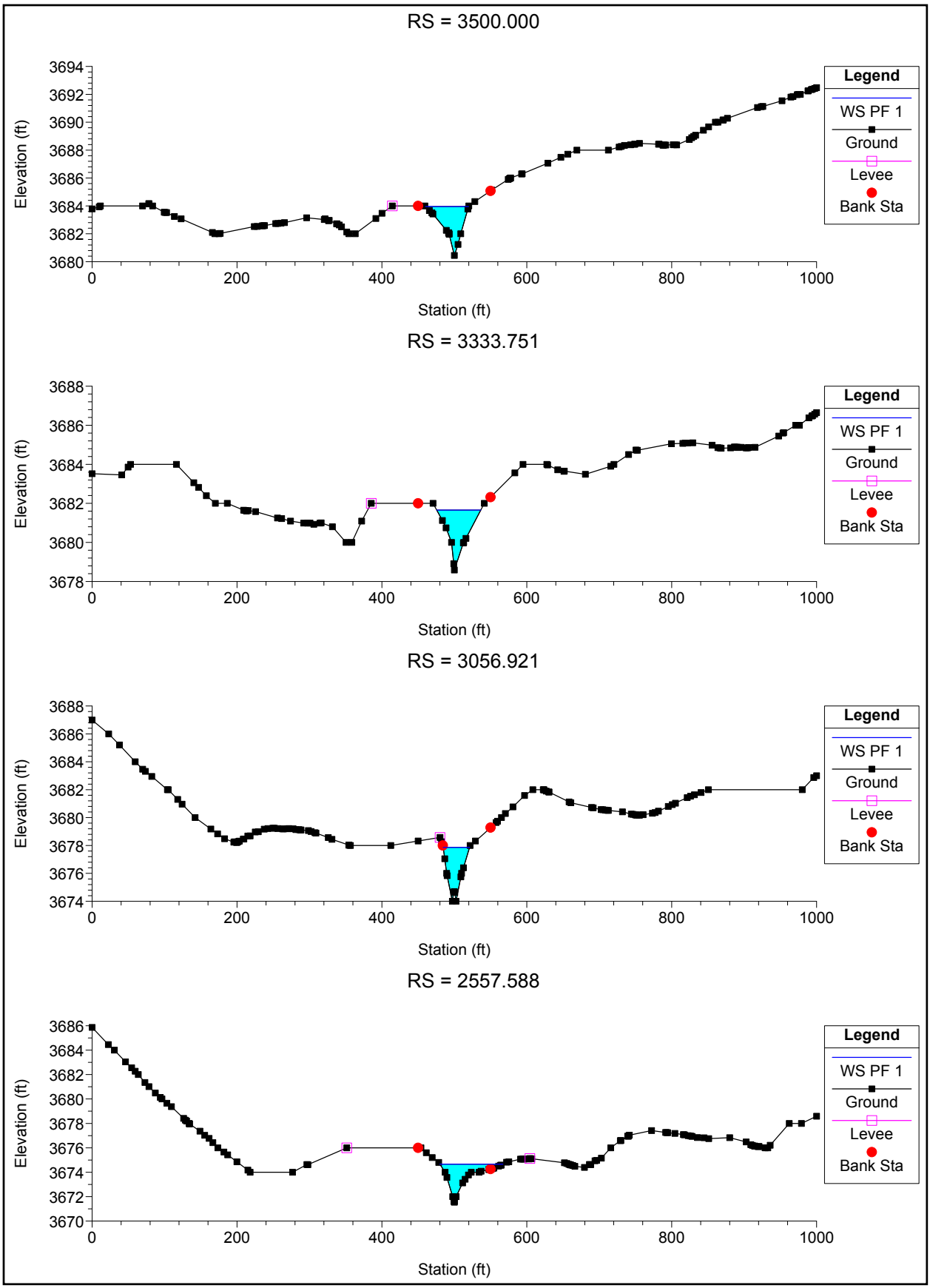
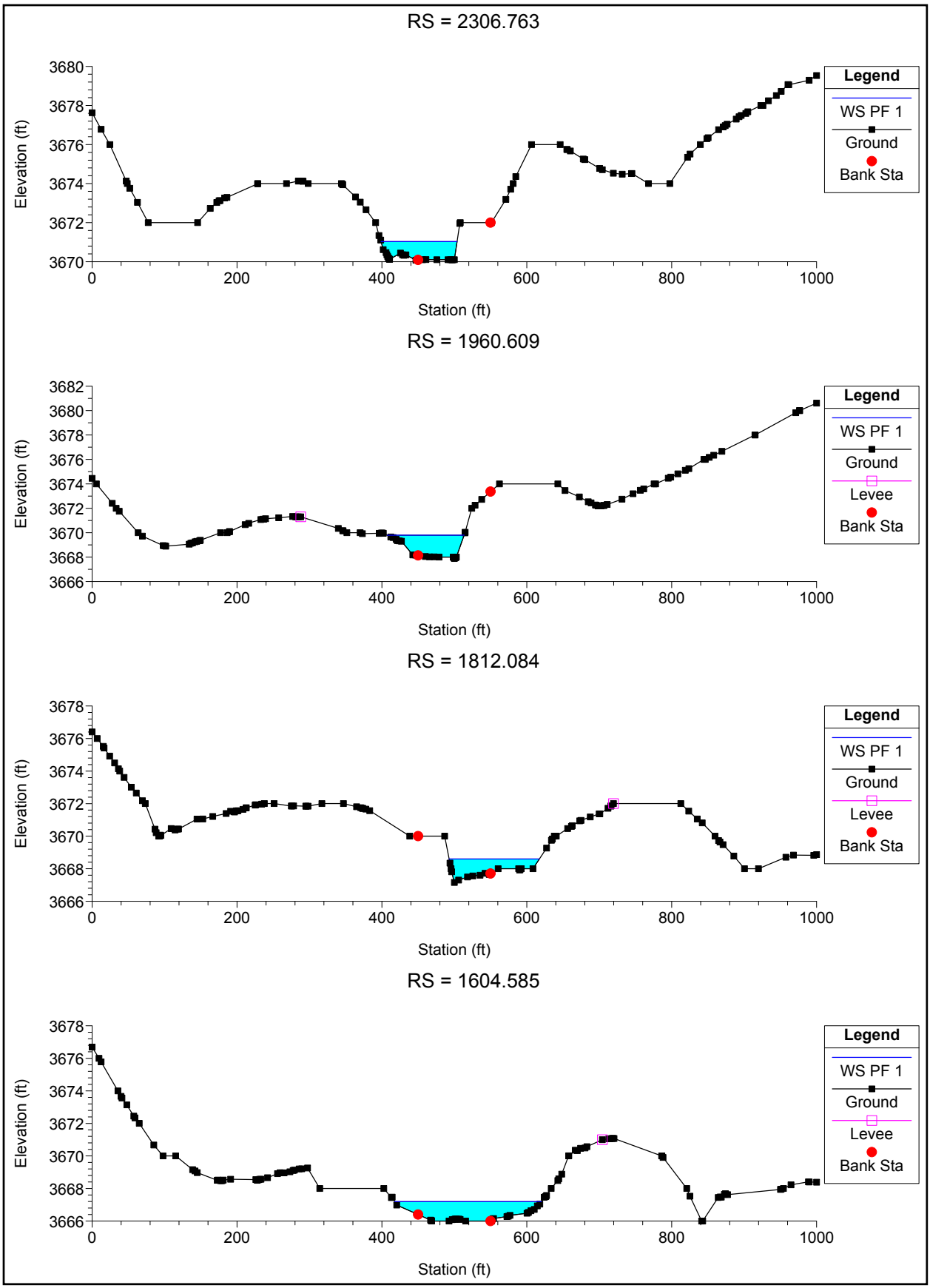
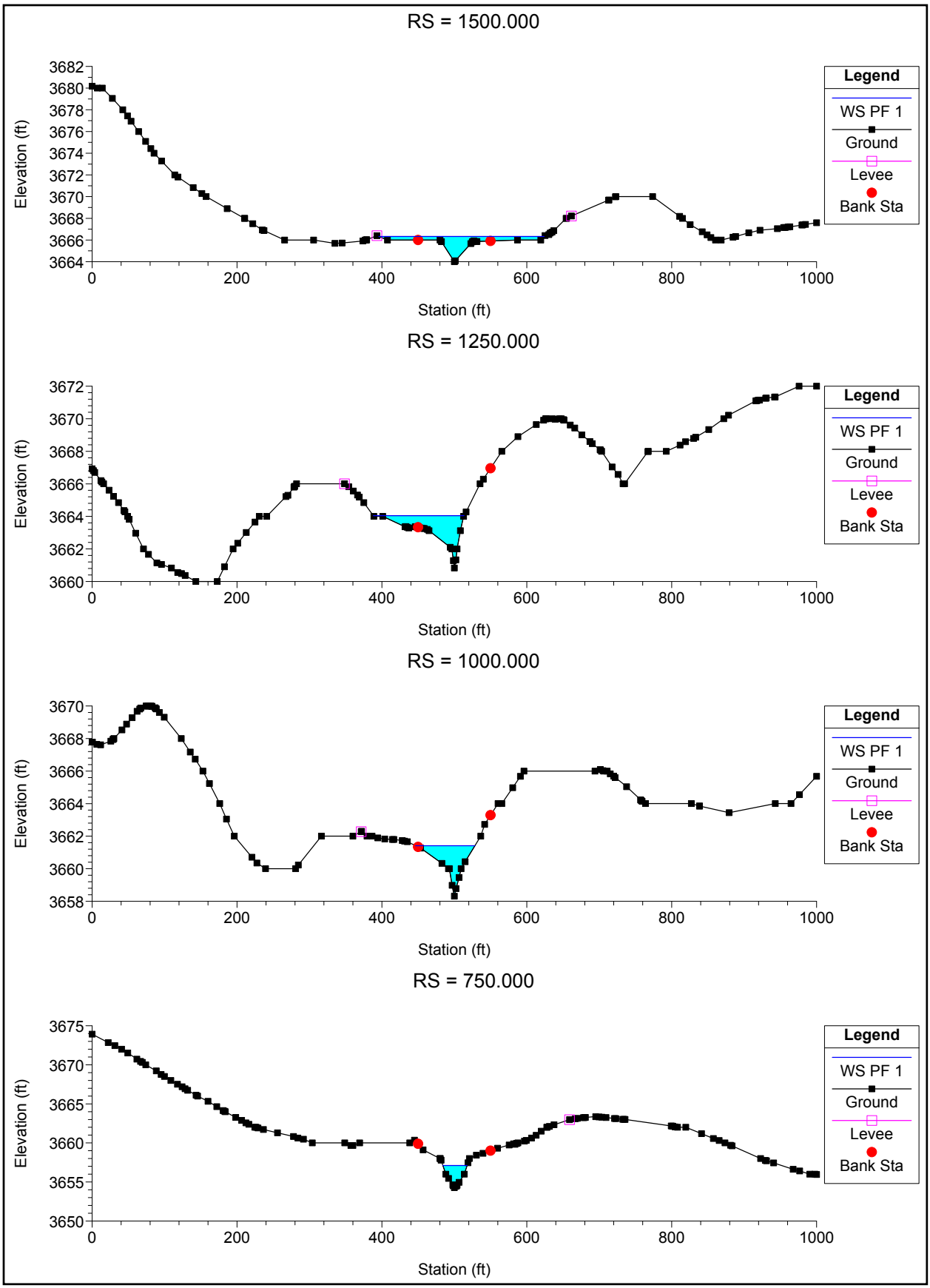
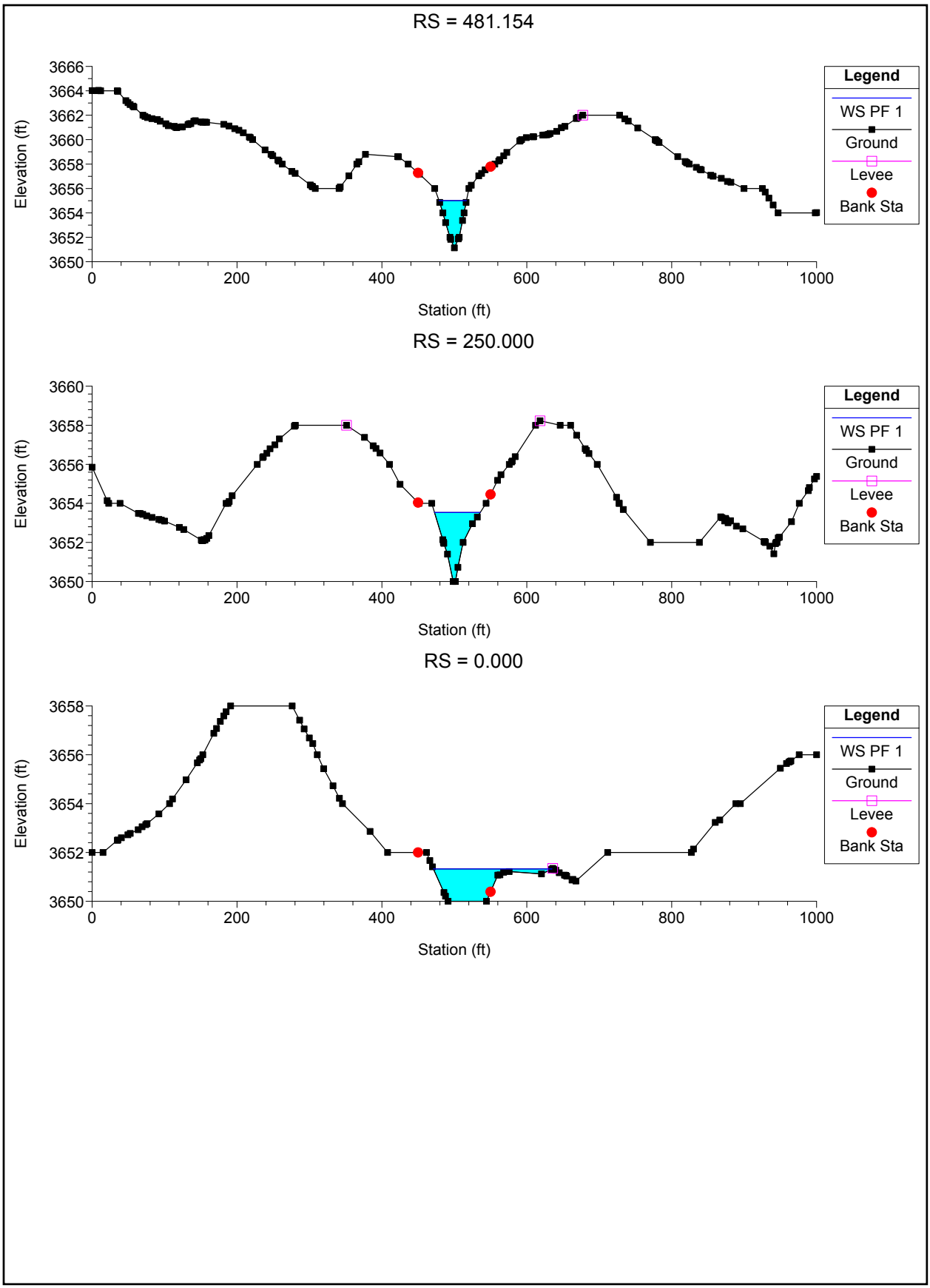
3702
3700
3698
3696
3694
3692
3690
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4000.000
Elevation (ft)
3700
3698
3696
3694
3692
3690
3688
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3750.273
Elevation (ft)
3694
3693
3692
3691
3690
3689
3688
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3533.283
Elevation (ft)
3692
3690
3688
3686
3684
3682
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 3500.000
Elevation (ft)
3694
3692
3690
3688
3686
3684
3682
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3333.751
Elevation (ft)
3688
3686
3684
3682
3680
3678
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3056.921
Elevation (ft)
3688
3686
3684
3682
3680
3678
3676
3674
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2557.588
Elevation (ft)
3686
3684
3682
3680
3678
3676
3674
3672
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 2306.763
Elevation (ft)
3680
3678
3676
3674
3672
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1960.609
Elevation (ft)
3682
3680
3678
3676
3674
3672
3670
3668
3666
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1812.084
Elevation (ft)
3678
3676
3674
3672
3670
3668
3666
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1604.585
Elevation (ft)
3678
3676
3674
3672
3670
3668
3666
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

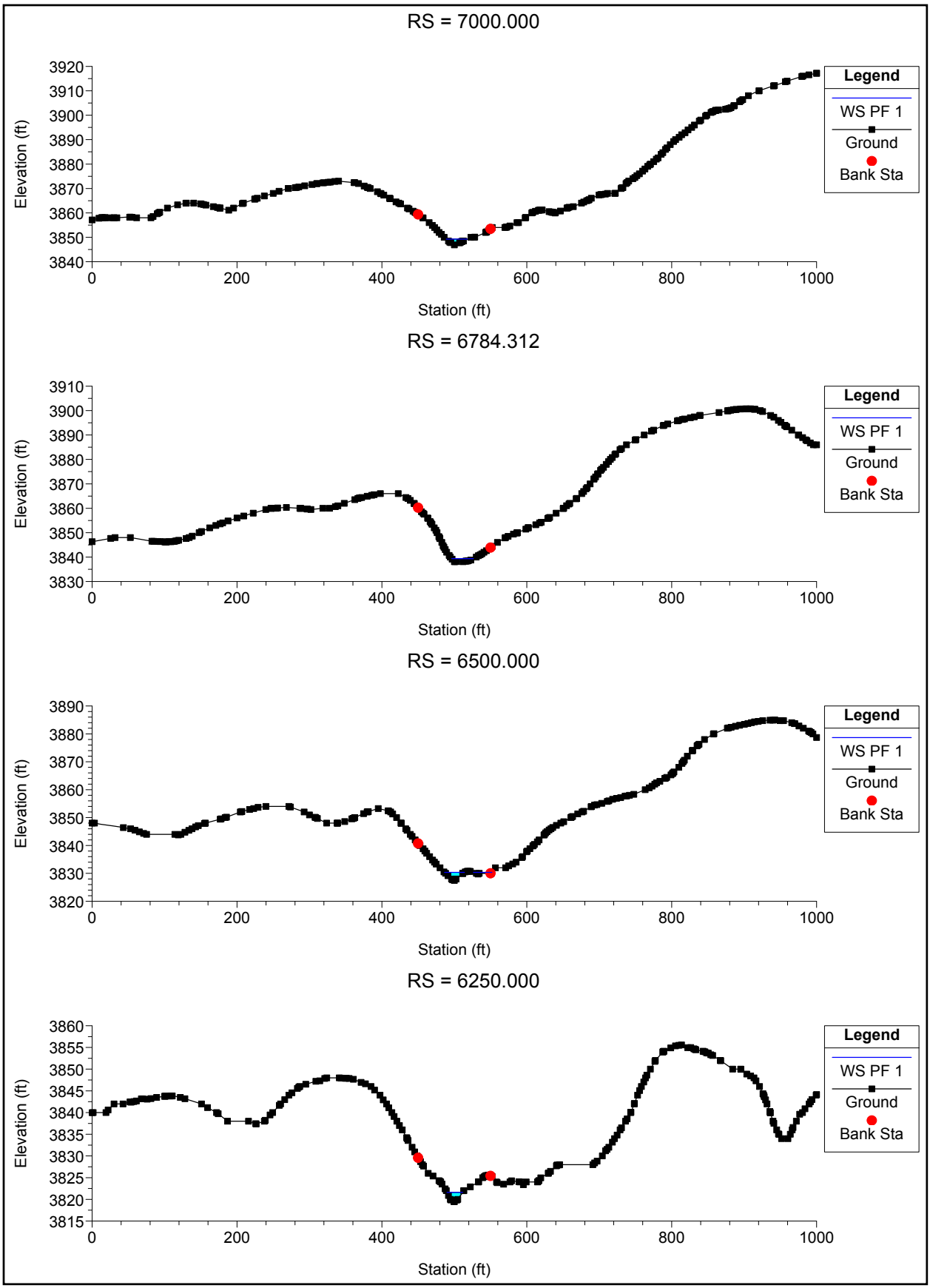

RS = 1500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 481.154
Elevation (ft)
3666
3664
3662
3660
3658
3656
3654
3652
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3660
3658
3656
3654
3652
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3658
3656
3654
3652
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-18

# HEC-RAS Channel 09E

| 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) | |
| 09E | 7000 | PF 1 | 308 | 3846.91 | 3849.26 | 3849.56 | 3850.4 | 0.031027 | 8.57 | 35.93 | 28.86 | 1.35 |
| 09E | 6784.312 | PF 1 | 308 | 3838.1 | 3839.35 | 3839.93 | 3841.24 | 0.075238 | 11.03 | 27.93 | 30.04 | 2.02 |
| 09E | 6500 | PF 1 | 308 | 3827.47 | 3830.35 | 3830.44 | 3830.96 | 0.023651 | 6.28 | 49.27 | 52.81 | 1.13 |
| 09E | 6250 | PF 1 | 308 | 3819.45 | 3821.62 | 3822.19 | 3823.36 | 0.043489 | 10.61 | 29.04 | 21.61 | 1.61 |
| 09E | 6000 | PF 1 | 308 | 3812.73 | 3814.76 | 3814.93 | 3815.63 | 0.025031 | 7.46 | 41.27 | 34.89 | 1.21 |
| 09E | 5750 | PF 1 | 308 | 3808.34 | 3810.21 | 3810.3 | 3810.8 | 0.022177 | 6.15 | 50.1 | 52.06 | 1.1 |
| 09E | 5500 | PF 1 | 308 | 3803.29 | 3805.25 | 3805.34 | 3805.85 | 0.02221 | 6.18 | 49.87 | 51.53 | 1.11 |
| 09E | 5261.715 | PF 1 | 308 | 3796.89 | 3798.23 | 3798.45 | 3799.03 | 0.046726 | 7.2 | 42.94 | 61.93 | 1.52 |
| 09E | 5011.558 | PF 1 | 308 | 3792.11 | 3795.14 | 3795.14 | 3795.85 | 0.016531 | 6.73 | 45.74 | 32.74 | 1 |
| 09E | 4750 | PF 1 | 308 | 3787.59 | 3790.28 | 3790.46 | 3791.13 | 0.023719 | 7.41 | 41.56 | 33.95 | 1.18 |
| 09E | 4500 | PF 1 | 308 | 3784.28 | 3785.37 | 3785.44 | 3785.84 | 0.02215 | 5.65 | 56.84 | 75.28 | 1.08 |
| 09E | 4238.037 | PF 1 | 308 | 3779.34 | 3780.88 | 3781.05 | 3781.64 | 0.028763 | 6.99 | 44.07 | 45.92 | 1.26 |
| 09E | 4000 | PF 1 | 308 | 3773.18 | 3774.91 | 3775.02 | 3775.53 | 0.025473 | 6.34 | 48.59 | 53.54 | 1.17 |
| 09E | 3738.564 | PF 1 | 308 | 3766.97 | 3768.72 | 3768.93 | 3769.47 | 0.033798 | 6.96 | 44.28 | 52.48 | 1.33 |
| 09E | 3500 | PF 1 | 308 | 3761.29 | 3762.43 | 3762.48 | 3762.87 | 0.023628 | 5.29 | 58.27 | 79.83 | 1.09 |
| 09E | 3250 | PF 1 | 308 | 3755.57 | 3756.58 | 3756.68 | 3757.12 | 0.028957 | 5.98 | 52.54 | 72.7 | 1.21 |
| 09E | 3000 | PF 1 | 308 | 3750 | 3751.12 | 3751.2 | 3751.68 | 0.024664 | 6.03 | 51.66 | 63.11 | 1.15 |
| 09E | 2750 | PF 1 | 308 | 3745.57 | 3746.72 | 3746.72 | 3747.09 | 0.020356 | 4.85 | 63.46 | 88.43 | 1.01 |
| 09E | 2500 | PF 1 | 308 | 3739.95 | 3740.83 | 3740.77 | 3741.01 | 0.014613 | 3.71 | 90.85 | 172.44 | 0.83 |
| 09E | 2250 | PF 1 | 308 | 3735.8 | 3736.48 | 3736.48 | 3736.71 | 0.022464 | 4.01 | 80.33 | 172.83 | 1 |
| 09E | 2000 | PF 1 | 308 | 3731.29 | 3731.42 | 3731.42 | 3731.42 | 0.000069 | 0.05 | 674.75 | 503.23 | 0.04 |
| 09E | 1814.563 | PF 1 | 308 | 3730 | 3727.62 | 3728.04 | 3731.04 | 0.626552 | | 20.78 | 81.46 | 0 |
| 09E | 1750 | PF 1 | 403 | 3726 | 3727.23 | 3727.11 | 3727.57 | 0.011859 | 4.7 | 87.42 | 94.83 | 0.82 |
| 09E | 1500 | PF 1 | 403 | 3721.91 | 3724.36 | 3724.36 | 3724.7 | 0.014333 | 4.8 | 91.88 | 138.4 | 0.88 |
| 09E | 1250 | PF 1 | 403 | 3715.56 | 3717.89 | 3718.42 | 3719.26 | 0.038261 | 9.39 | 42.91 | 35.34 | 1.5 |
| 09E | 1000 | PF 1 | 403 | 3710.02 | 3712.87 | 3712.87 | 3713.64 | 0.015765 | 7.07 | 57 | 36.84 | 1 |
| 09E | 750 | PF 1 | 403 | 3705.55 | 3707.84 | 3707.25 | 3708.02 | 0.004233 | 3.44 | 117.67 | 88.16 | 0.51 |
| 09E | 500 | PF 1 | 403 | 3703.23 | 3706.45 | | 3706.7 | 0.008026 | 4.23 | 115.35 | 180.85 | 0.69 |
| 09E | 250 | PF 1 | 403 | 3700.6 | 3703.32 | 3703.32 | 3703.96 | 0.016299 | 6.4 | 63.01 | 48.82 | 0.99 |
| 09E | 0 | PF 1 | 403 | 3698.48 | 3700.29 | 3700.06 | 3700.55 | 0.008007 | 4.17 | 102.14 | 108.06 | 0.69 |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3890
3880
3870
3860
3850
3840
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6784.312
Elevation (ft)
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3900
3890
3880
3870
3860
3850
3840
3830
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6500.000
Elevation (ft)
3890
3880
3870
3860
3850
3840
3830
3820
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6250.000
Elevation (ft)
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3855
3850
3845
3840
3835
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3820
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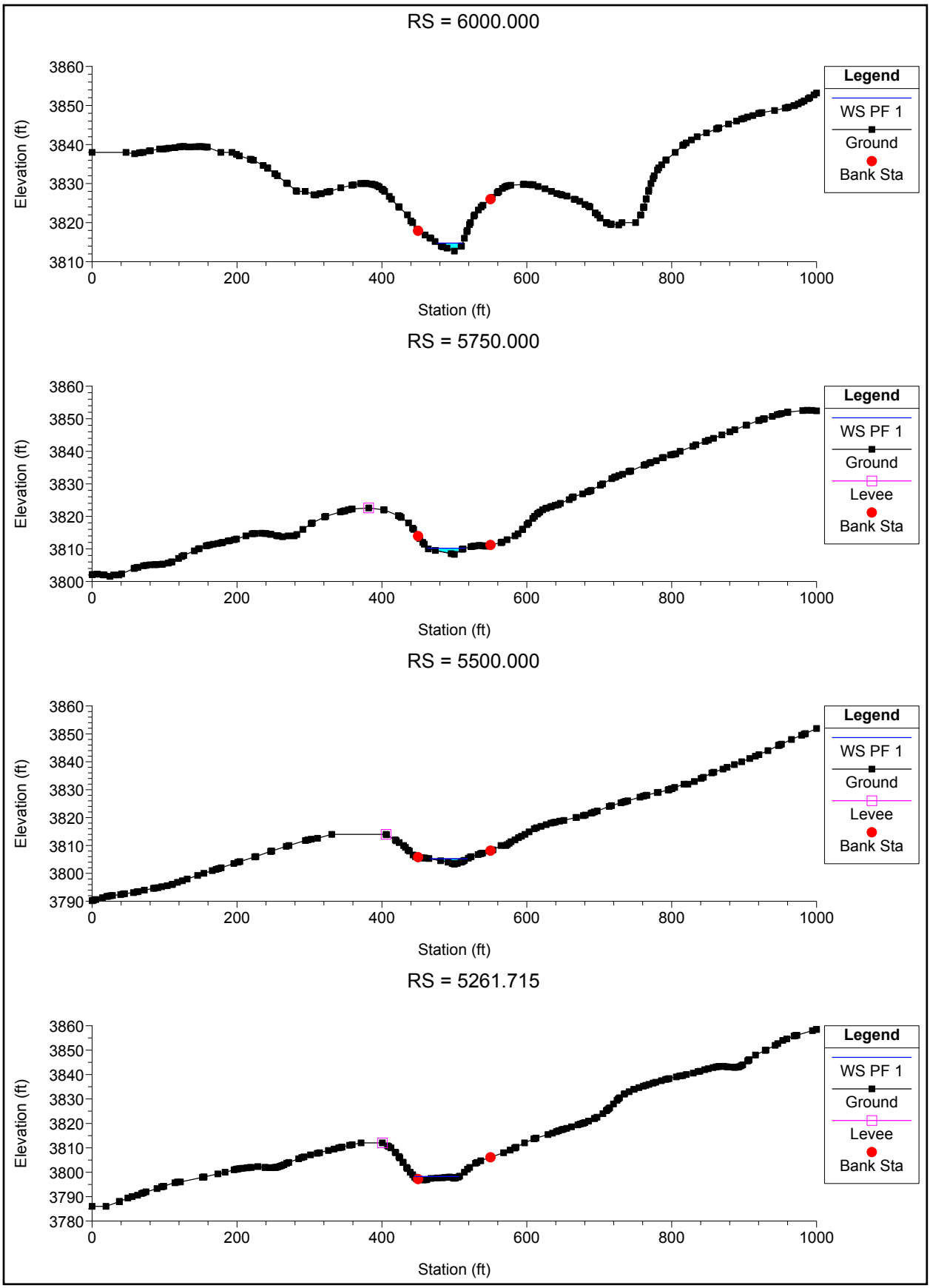
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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600
800
1000
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Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
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3840
3830
3820
3810
3800
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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Elevation (ft)
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3850
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5261.715
Elevation (ft)
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3850
3840
3830
3820
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3790
3780
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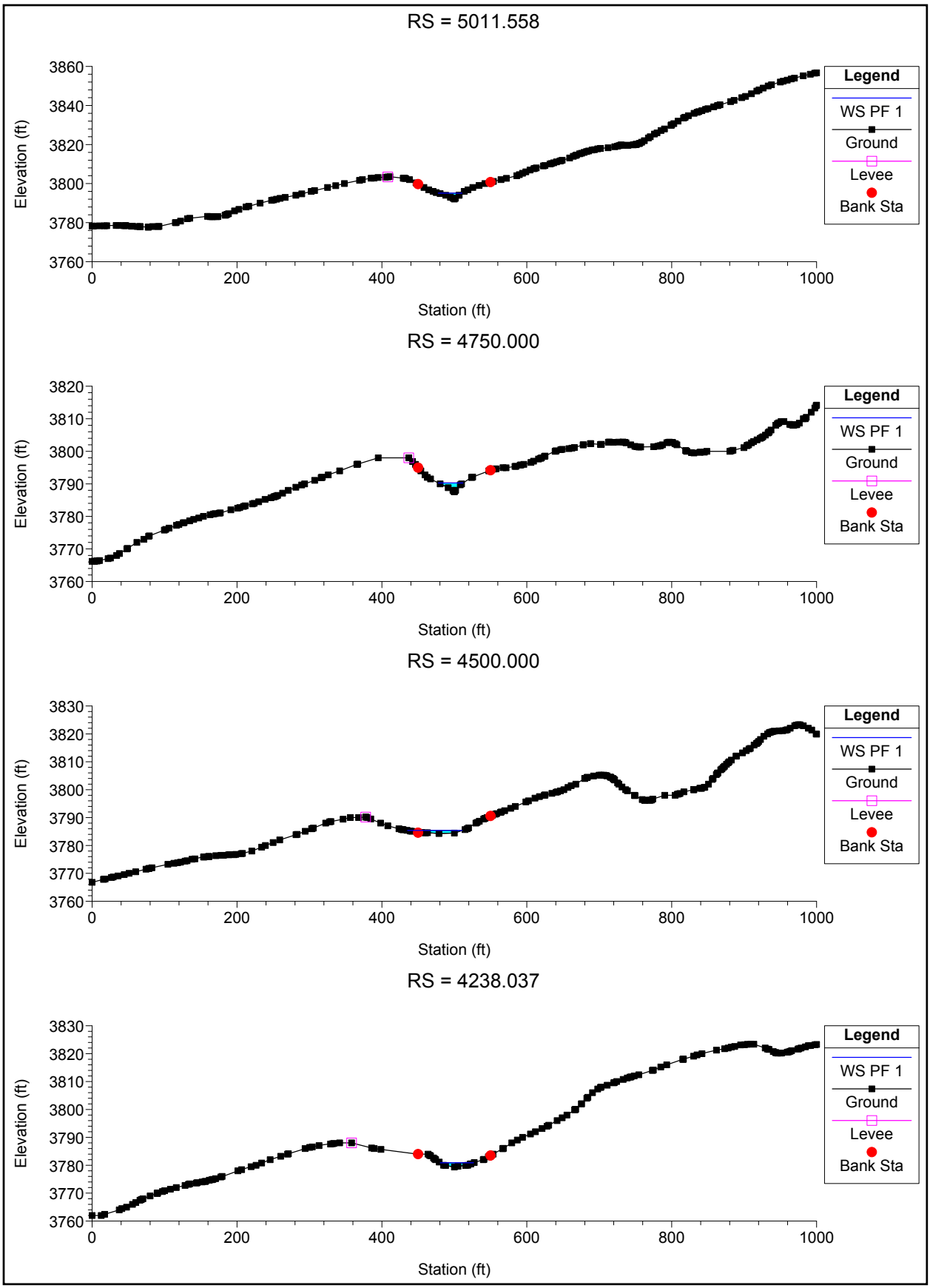
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3760
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400
600
800
1000
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WS PF 1
Ground
Levee
Bank Sta
RS = 4750.000
Elevation (ft)
3820
3810
3800
3790
3780
3770
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4500.000
Elevation (ft)
3830
3820
3810
3800
3790
3780
3770
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4238.037
Elevation (ft)
3830
3820
3810
3800
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Legend
WS PF 1
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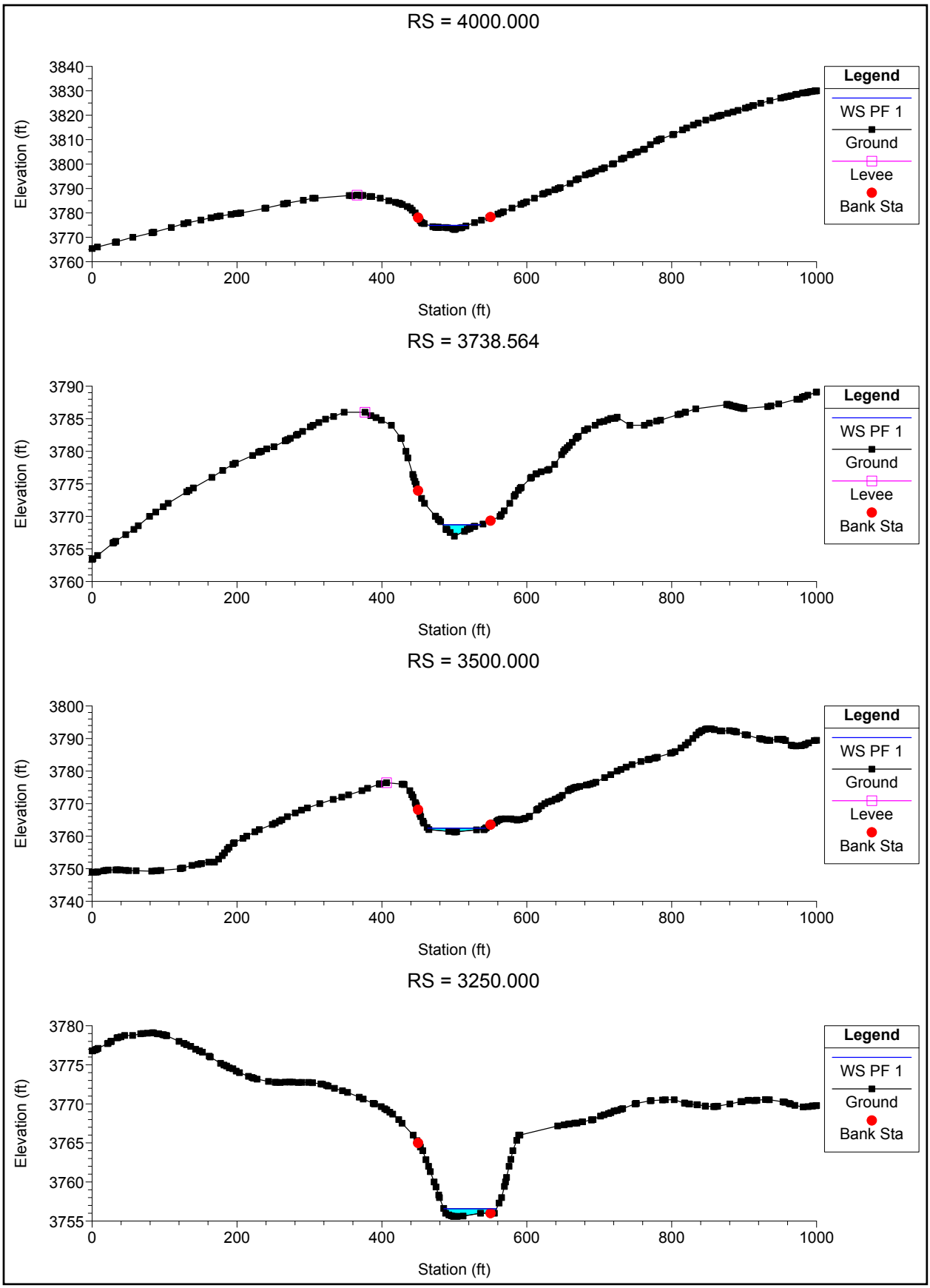
Levee
Bank Sta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3810
3800
3790
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3770
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3738.564
Elevation (ft)
3790
3785
3780
3775
3770
3765
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3500.000
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3250.000
Elevation (ft)
3780
3775
3770
3765
3760
3755
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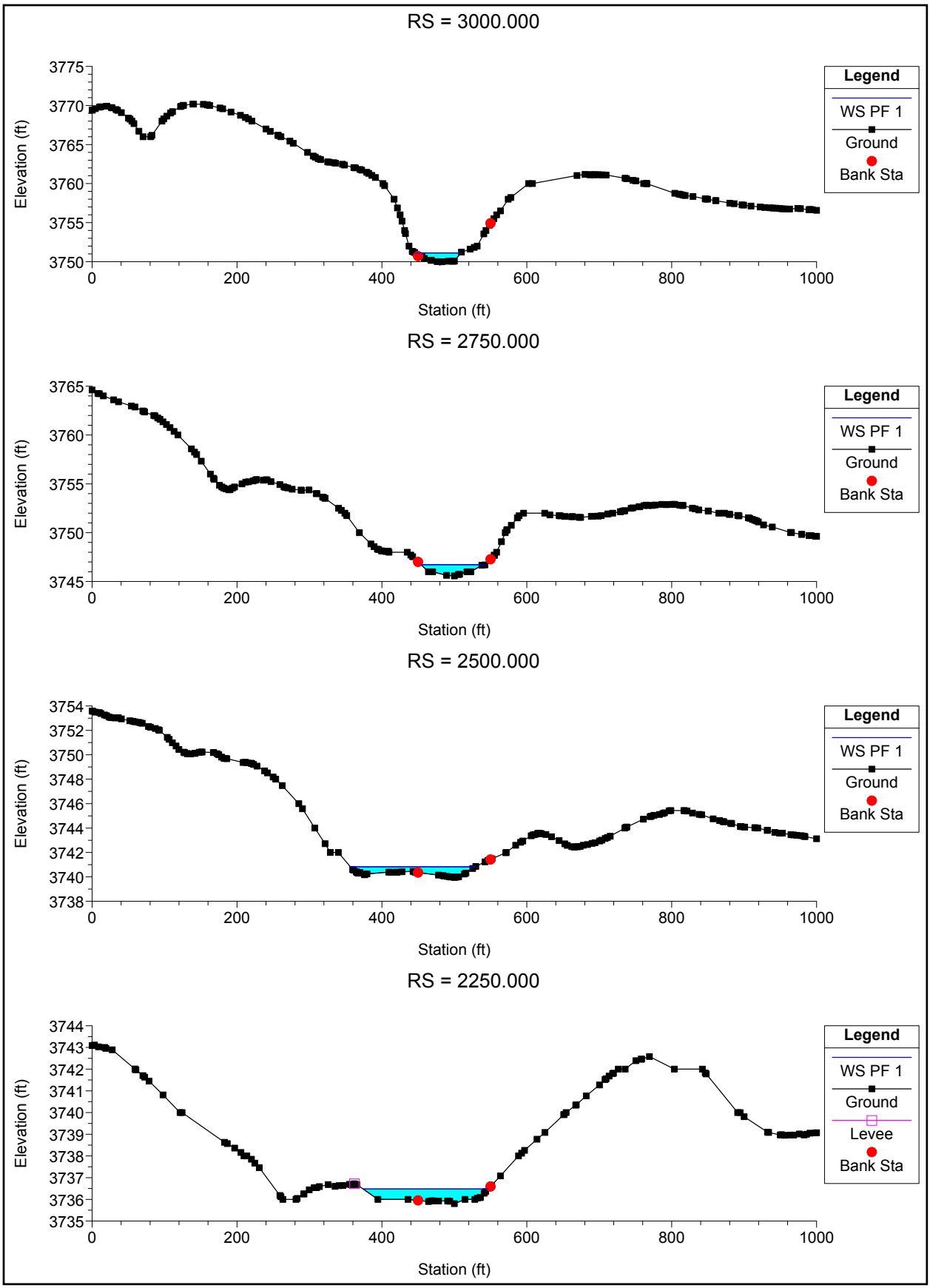
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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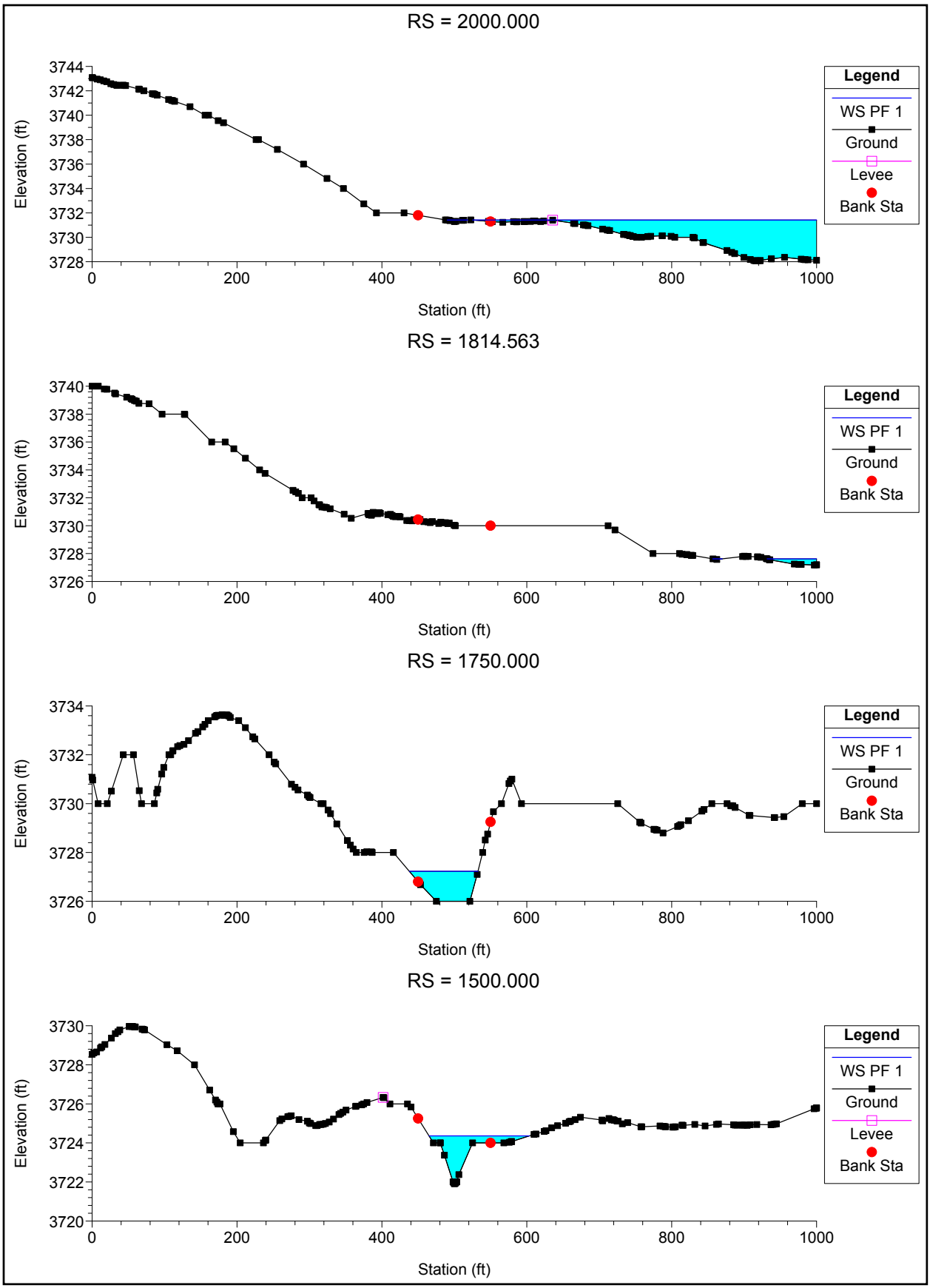
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2750.000
Elevation (ft)
3765
3760
3755
3750
3745
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2500.000
Elevation (ft)
3754
3752
3750
3748
3746
3744
3742
3740
3738
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3744
3743
3742
3741
3740
3739
3738
3737
3736
3735
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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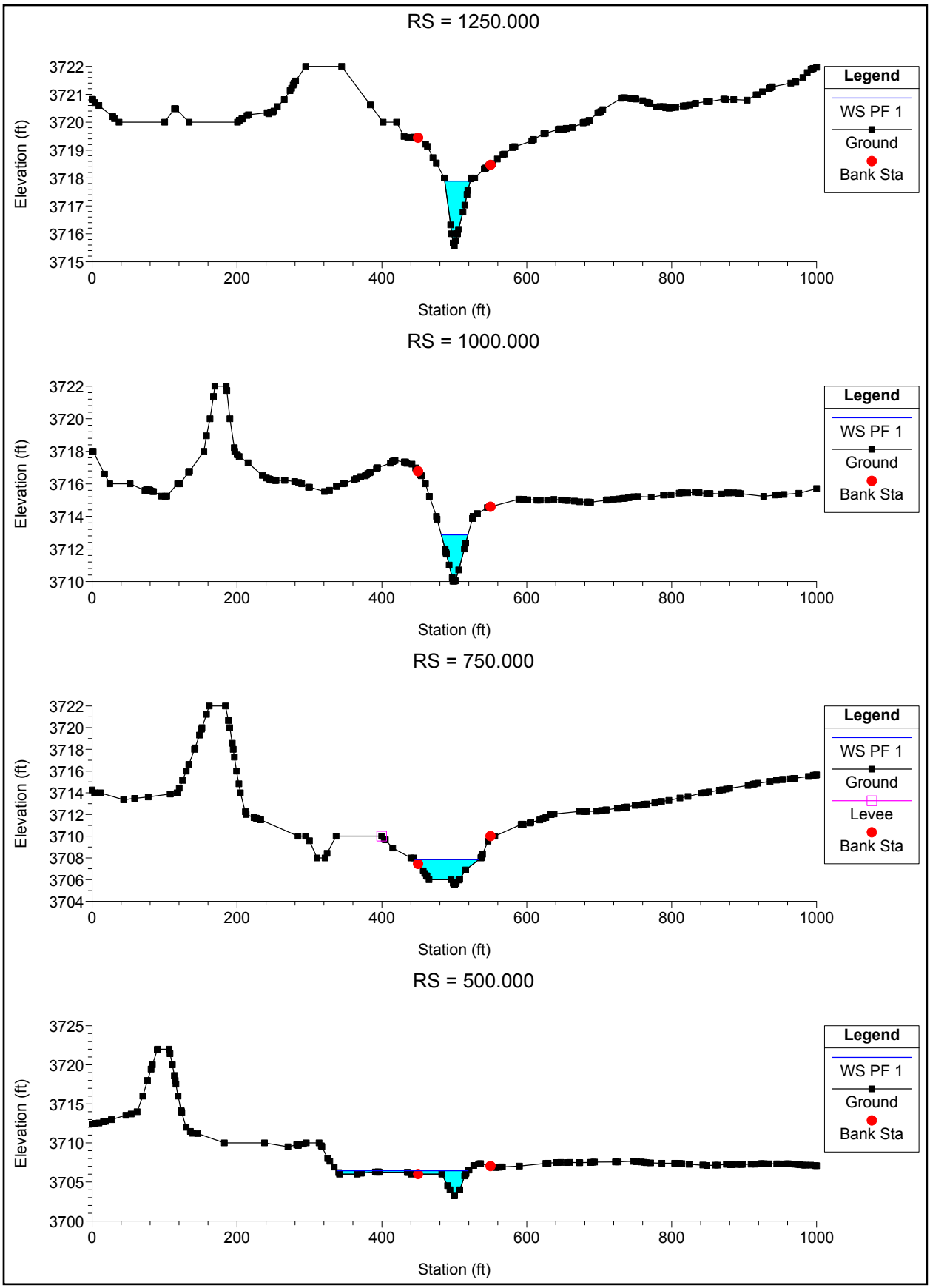
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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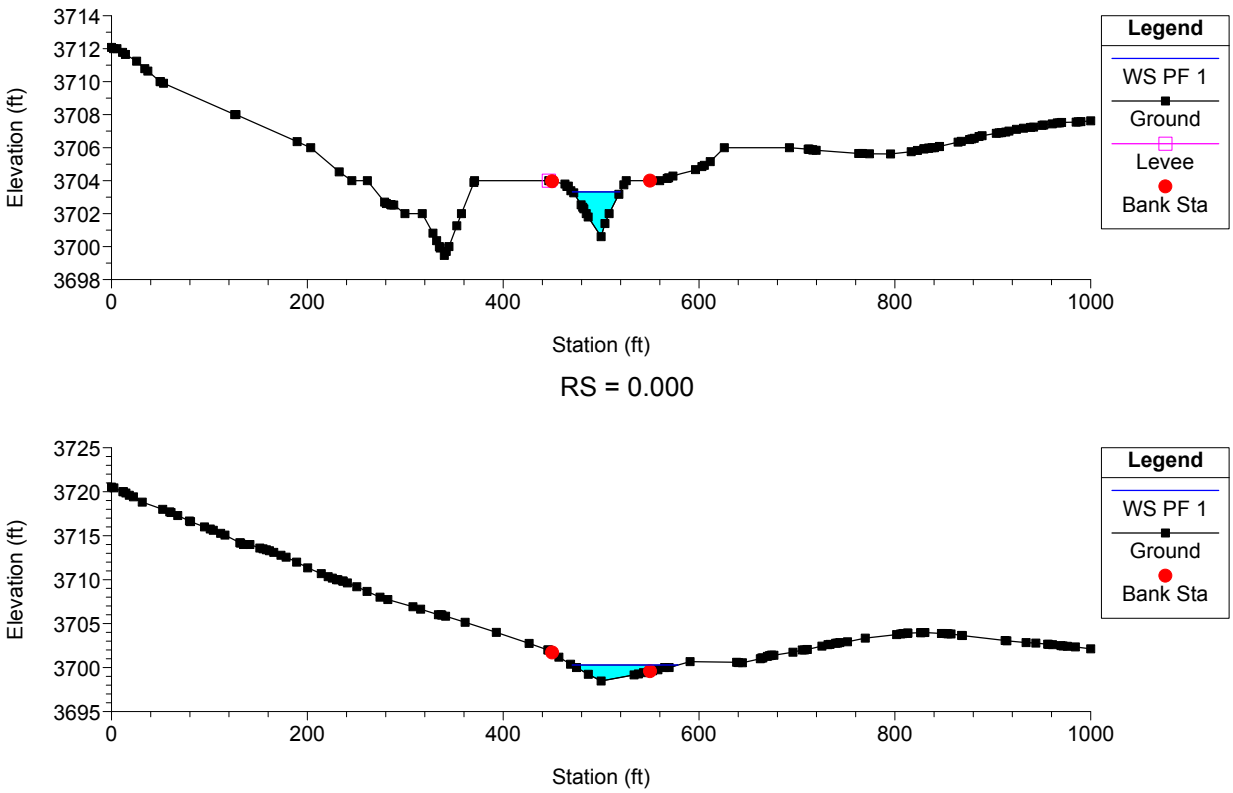
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3700
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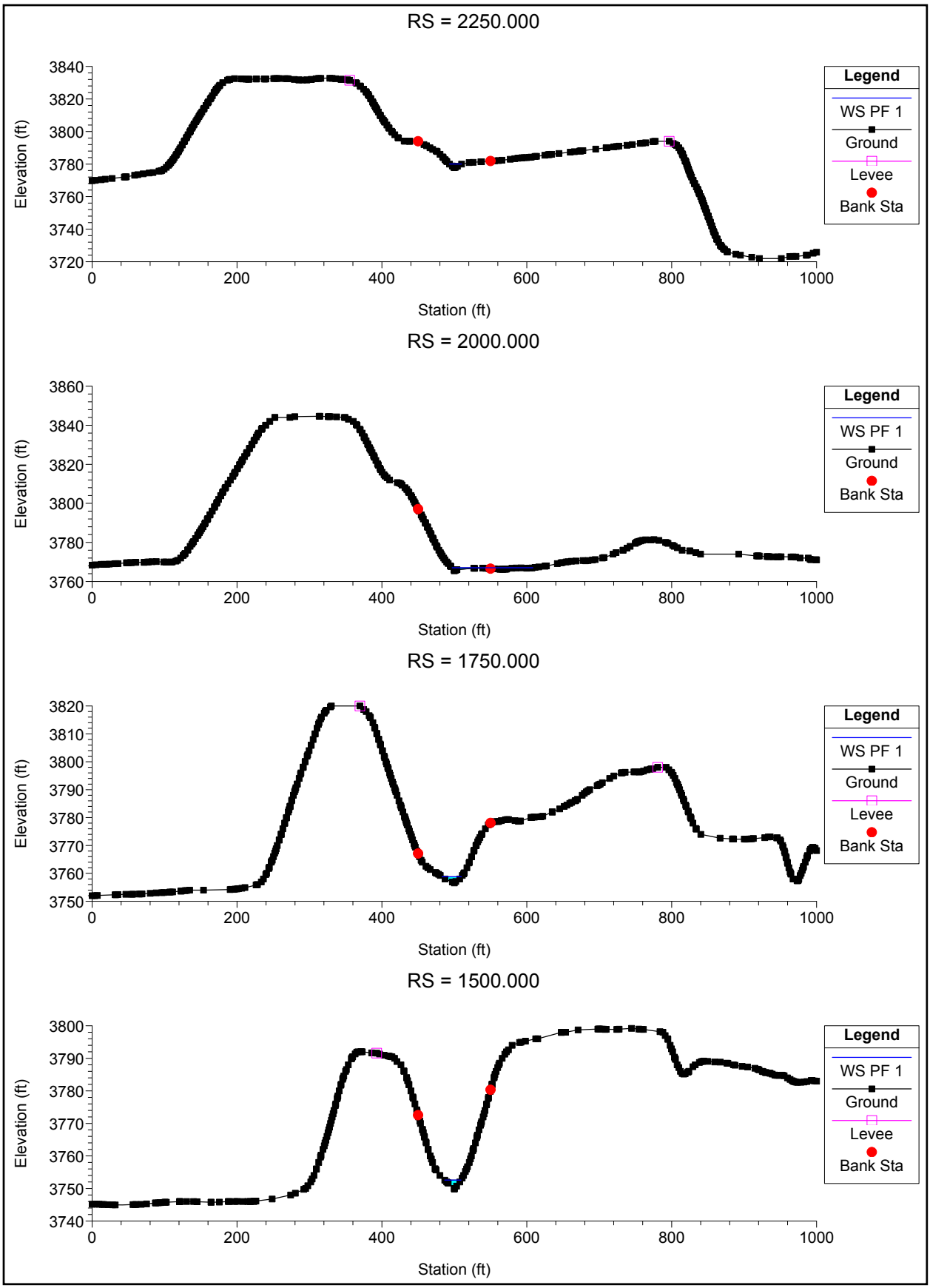
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 0.000
Elevation (ft)
3725
3720
3715
3710
3705
3700
3695
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-19

# HEC-RAS Channel 09F

| 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) | |
| 09F | 2250 | PF 1 | 240 | 3777.75 | 3780.01 | 3780.82 | 3782.52 | 0.080034 | 12.71 | 18.89 | 16.72 | 2.11 |
| 09F | 2000 | PF 1 | 240 | 3765.45 | 3767.01 | 3767.1 | 3767.43 | 0.044582 | 5.57 | 47.07 | 111.52 | 1.4 |
| 09F | 1750 | PF 1 | 240 | 3756.6 | 3758.77 | 3758.97 | 3759.66 | 0.025537 | 7.57 | 31.69 | 26.45 | 1.22 |
| 09F | 1500 | PF 1 | 240 | 3749.83 | 3752.6 | 3752.81 | 3753.56 | 0.023985 | 7.87 | 30.51 | 22.53 | 1.19 |
| 09F | 1250 | PF 1 | 240 | 3741.17 | 3744.66 | 3745.2 | 3746.4 | 0.039258 | 10.59 | 22.66 | 14.28 | 1.48 |
| 09F | 1042.407 | PF 1 | 240 | 3735.25 | 3738.67 | 3739.13 | 3739.92 | 0.025979 | 9.05 | 27.79 | 23.1 | 1.24 |
| 09F | 720.461 | PF 1 | 240 | 3728.76 | 3731.57 | 3731.73 | 3732.36 | 0.023214 | 7.13 | 33.67 | 28.47 | 1.16 |
| 09F | 500 | PF 1 | 240 | 3724.33 | 3726.83 | 3726.86 | 3727.2 | 0.023558 | 4.91 | 48.88 | 74.91 | 1.07 |
| 09F | 250 | PF 1 | 240 | 3720.56 | 3721.96 | 3721.96 | 3722.31 | 0.019588 | 4.8 | 50.02 | 68.88 | 0.99 |
| 09F | 0 | PF 1 | 240 | 3716 | 3717.27 | 3717.21 | 3717.58 | 0.01502 | 4.57 | 54.5 | 71.61 | 0.88 |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200
400
600
800
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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2000.000
Elevation (ft)
3860
3840
3820
3800
3780
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3820
3810
3800
3790
3780
3770
3760
3750
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1500.000
Elevation (ft)
3800
3790
3780
3770
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3740
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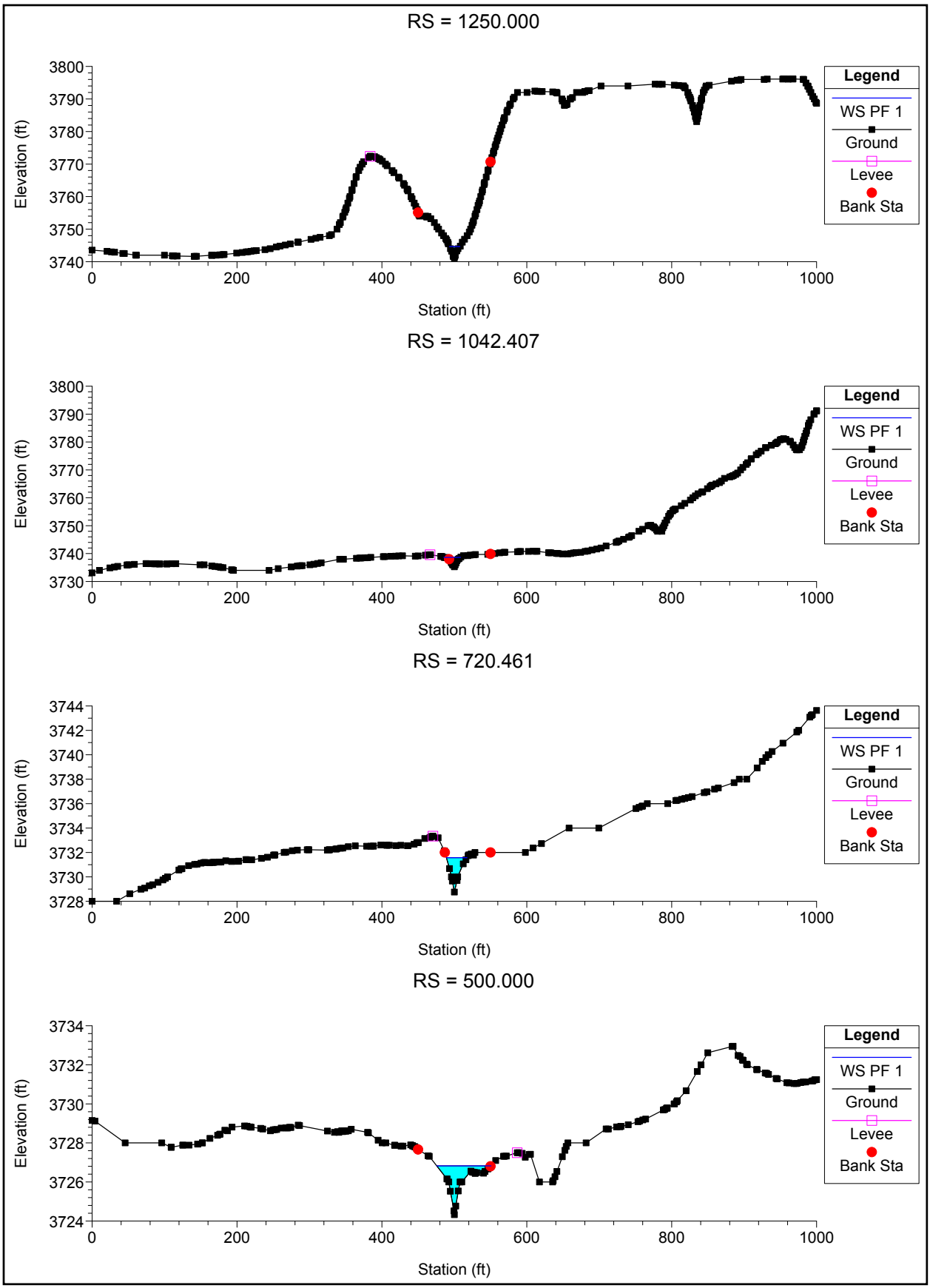
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1042.407
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 720.461
Elevation (ft)
3744
3742
3740
3738
3736
3734
3732
3730
3728
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
3734
3732
3730
3728
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3724
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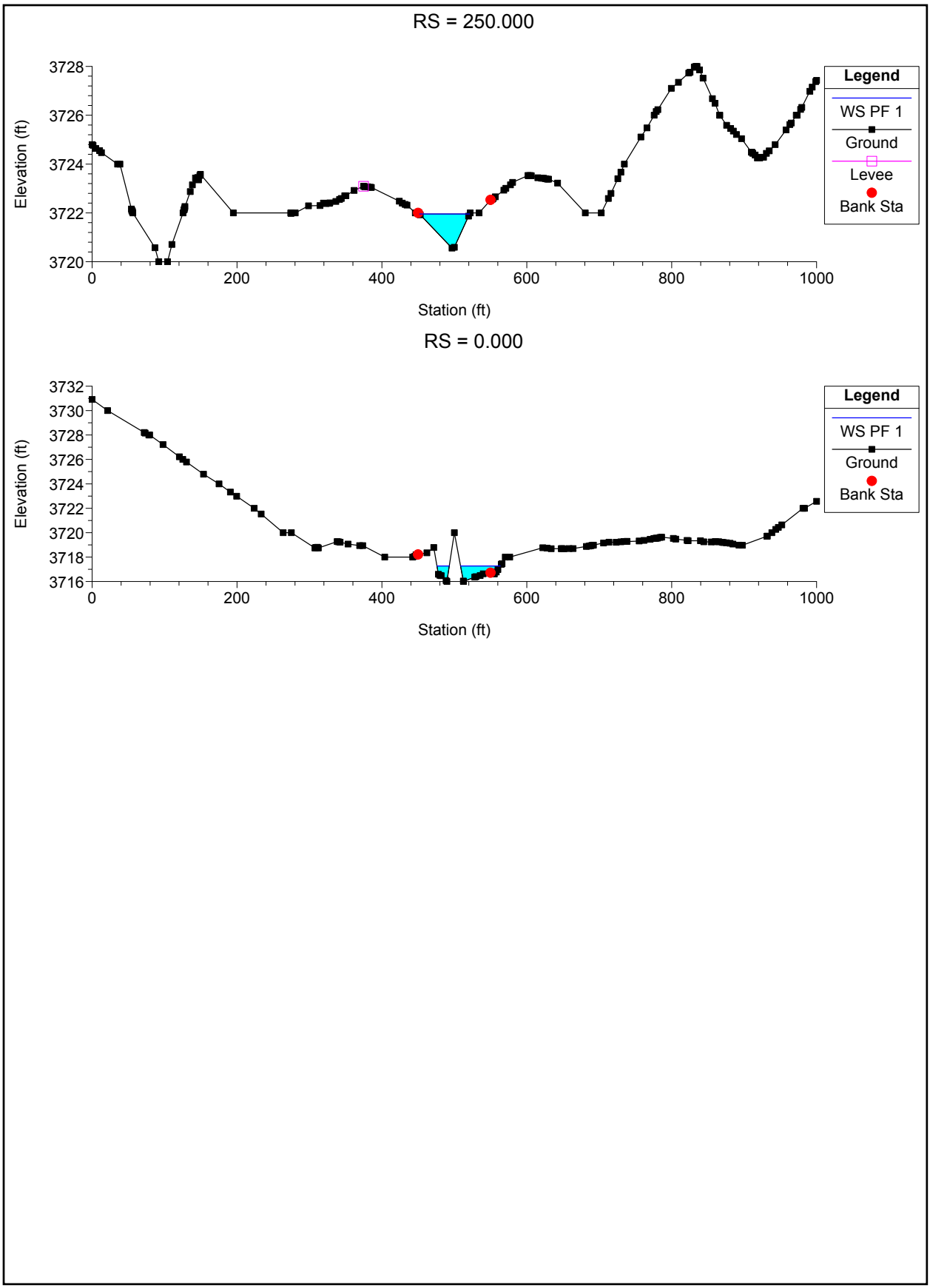
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3722
3720
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3732
3730
3728
3726
3724
3722
3720
3718
3716
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-20

# HEC-RAS Channel 10

| 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) | |
| 10 | 7250 | PF 1 | 524 | 3638.84 | 3640.53 | 3640.53 | 3641.03 | 0.016088 | 5.68 | 93.91 | 95.15 | 0.96 |
| 10 | 7000 | PF 1 | 524 | 3631.68 | 3633.8 | 3634.25 | 3634.98 | 0.048527 | 8.73 | 59.99 | 66.29 | 1.62 |
| 10 | 6750 | PF 1 | 524 | 3628.61 | 3630.83 | 3630.76 | 3631.26 | 0.013305 | 5.45 | 102.24 | 102.9 | 0.89 |
| 10 | 6500 | PF 1 | 524 | 3626.27 | 3628.17 | 3628.17 | 3628.51 | 0.014041 | 4.91 | 119.29 | 194.91 | 0.88 |
| 10 | 6250 | PF 1 | 524 | 3623.69 | 3624.92 | 3624.8 | 3625.18 | 0.012521 | 4.22 | 128.62 | 162.52 | 0.81 |
| 10 | 6000 | PF 1 | 524 | 3621.28 | 3622.01 | 3621.91 | 3622.22 | 0.012521 | 2.97 | 144.43 | 220.97 | 0.74 |
| 10 | 5750 | PF 1 | 524 | 3618.97 | 3620.13 | 3619.88 | 3620.26 | 0.006953 | 3.25 | 188.72 | 291.11 | 0.61 |
| 10 | 5500 | PF 1 | 524 | 3616.54 | 3617.31 | 3617.31 | 3617.58 | 0.020215 | 4.46 | 127.07 | 233.9 | 0.99 |
| 10 | 5250 | PF 1 | 524 | 3614 | 3616.06 | 3615.23 | 3616.15 | 0.001937 | 2.62 | 213.02 | 154.69 | 0.36 |
| 10 | 5000 | PF 1 | 524 | 3614 | 3615.22 | 3614.88 | 3615.42 | 0.006223 | 3.68 | 147.31 | 134.95 | 0.6 |
| 10 | 4817.452 | PF 1 | 524 | 3612.77 | 3613.29 | 3613.29 | 3613.58 | 0.019129 | 2.94 | 122.24 | 212.25 | 0.87 |
| 10 | 4591.478 | PF 1 | 524 | 3606 | 3608.96 | 3607.76 | 3609 | 0.0007 | 1.86 | 339.25 | 248.64 | 0.22 |
| 10 | 4500 | PF 1 | 588 | 3607.3 | 3608.49 | 3608.49 | 3608.79 | 0.022579 | 4.23 | 135.52 | 243.16 | 1.01 |
| 10 | 4250 | PF 1 | 588 | 3602.74 | 3606.09 | 3605.58 | 3606.35 | 0.004914 | 4.29 | 169.93 | 294.96 | 0.57 |
| 10 | 4000 | PF 1 | 588 | 3600.99 | 3604.5 | 3604.45 | 3604.87 | 0.011297 | 5.1 | 131.55 | 158.42 | 0.82 |
| 10 | 3773.643 | PF 1 | 588 | 3599.49 | 3602.63 | 3602.63 | 3603.14 | 0.015484 | 5.85 | 105.24 | 104.52 | 0.95 |
| 10 | 3500 | PF 1 | 588 | 3598.03 | 3601.51 | 3600.66 | 3601.75 | 0.003509 | 3.9 | 151.32 | 80.01 | 0.49 |
| 10 | 3250 | PF 1 | 588 | 3596.57 | 3599.73 | 3599.73 | 3600.52 | 0.0159 | 7.16 | 82.12 | 52.64 | 1.01 |
| 10 | 3000 | PF 1 | 588 | 3595.07 | 3598.33 | 3597.24 | 3598.45 | 0.001717 | 2.78 | 236.35 | 207.16 | 0.35 |
| 10 | 2750 | PF 1 | 588 | 3593.94 | 3597.52 | 3597.24 | 3597.86 | 0.008404 | 4.67 | 129.26 | 112.74 | 0.72 |
| 10 | 2500 | PF 1 | 588 | 3592.58 | 3596.14 | 3596.14 | 3596.31 | 0.006032 | 3.72 | 239.11 | 680.9 | 0.6 |
| 10 | 2250 | PF 1 | 588 | 3591.31 | 3594.64 | 3594.6 | 3594.69 | 0.002502 | 2.25 | 357.45 | 621.99 | 0.38 |
| 10 | 2000 | PF 1 | 588 | 3590.1 | 3592.63 | 3592.62 | 3592.9 | 0.013418 | 4.67 | 156.09 | 290.27 | 0.85 |
| 10 | 1750 | PF 1 | 588 | 3589.09 | 3591.29 | 3590.99 | 3591.48 | 0.006063 | 3.71 | 174.88 | 187.03 | 0.6 |
| 10 | 1500 | PF 1 | 588 | 3588.09 | 3589.89 | 3589.89 | 3590.4 | 0.017691 | 5.74 | 102.91 | 105.63 | 1 |
| 10 | 1233.811 | PF 1 | 588 | 3587.03 | 3588.81 | 3588.48 | 3588.85 | 0.002783 | 1.51 | 351.24 | 588.76 | 0.36 |
| 10 | 940.221 | PF 1 | 588 | 3585.8 | 3587.16 | 3587.16 | 3587.56 | 0.017786 | 5.34 | 117.13 | 142.73 | 0.98 |
| 10 | 750 | PF 1 | 588 | 3584.75 | 3586.01 | 3586.01 | 3586.02 | 0.000363 | 0.24 | 612.42 | 531.29 | 0.1 |
| 10 | 500 | PF 1 | 588 | 3583.24 | 3584.22 | 3584.24 | 3585.56 | 0.287376 | 10.33 | 65.23 | 278.92 | 3.29 |
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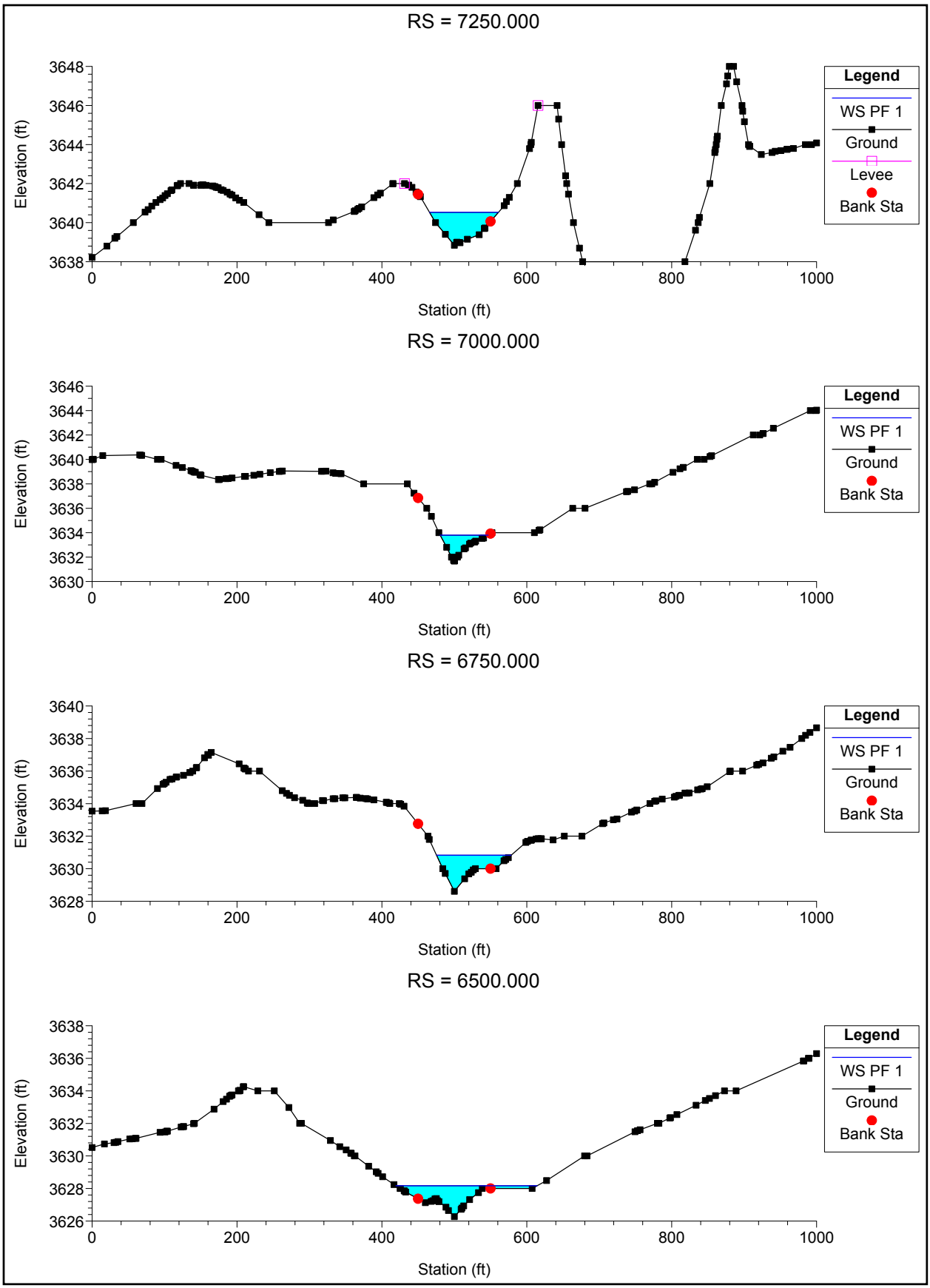
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1000
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Legend
WS PF 1
Ground
Levee
Bank Sta
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800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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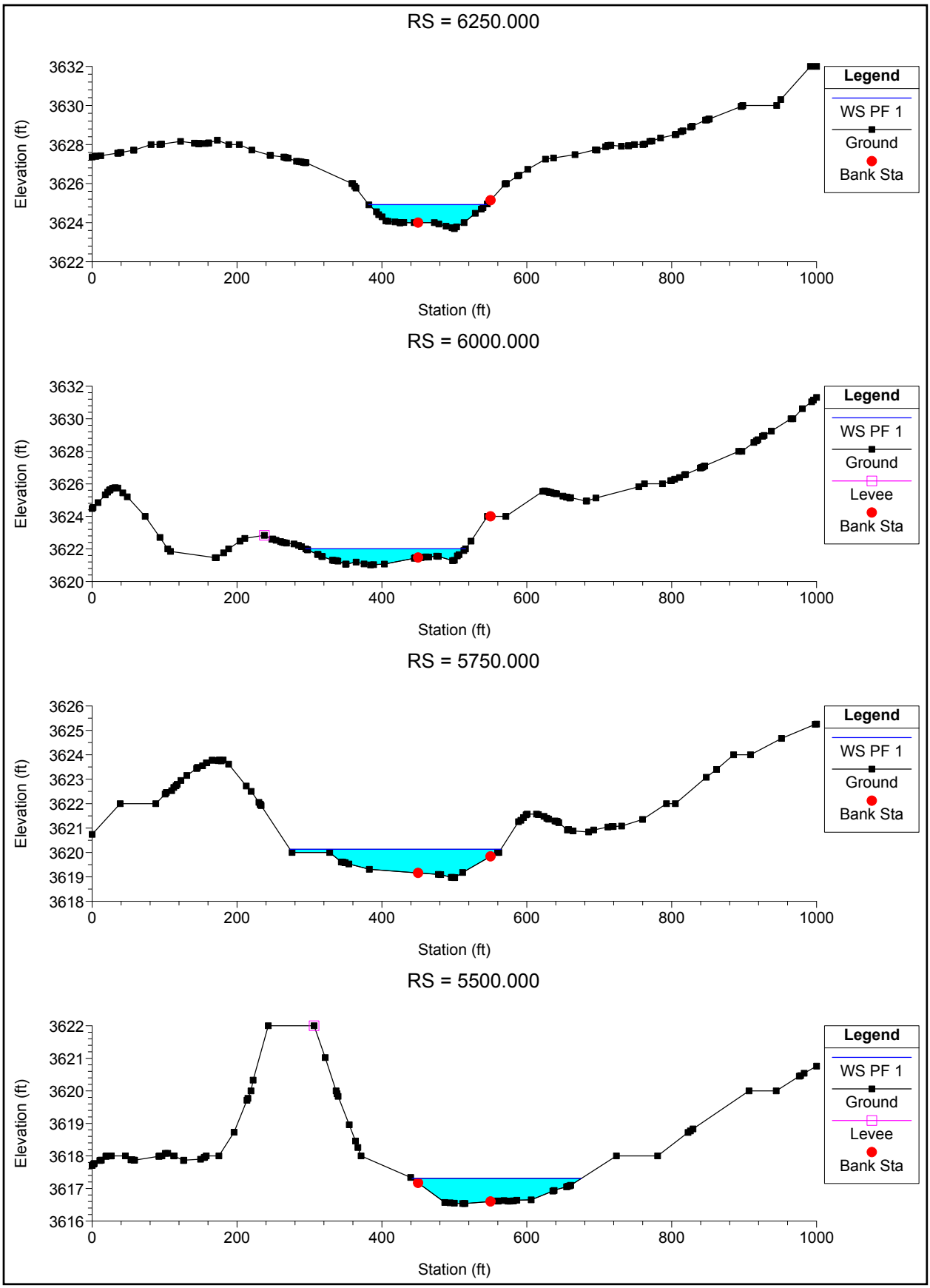
Bank Sta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WS PF 1
Ground
Bank Sta
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3628
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800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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Station (ft)
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Ground
Bank Sta
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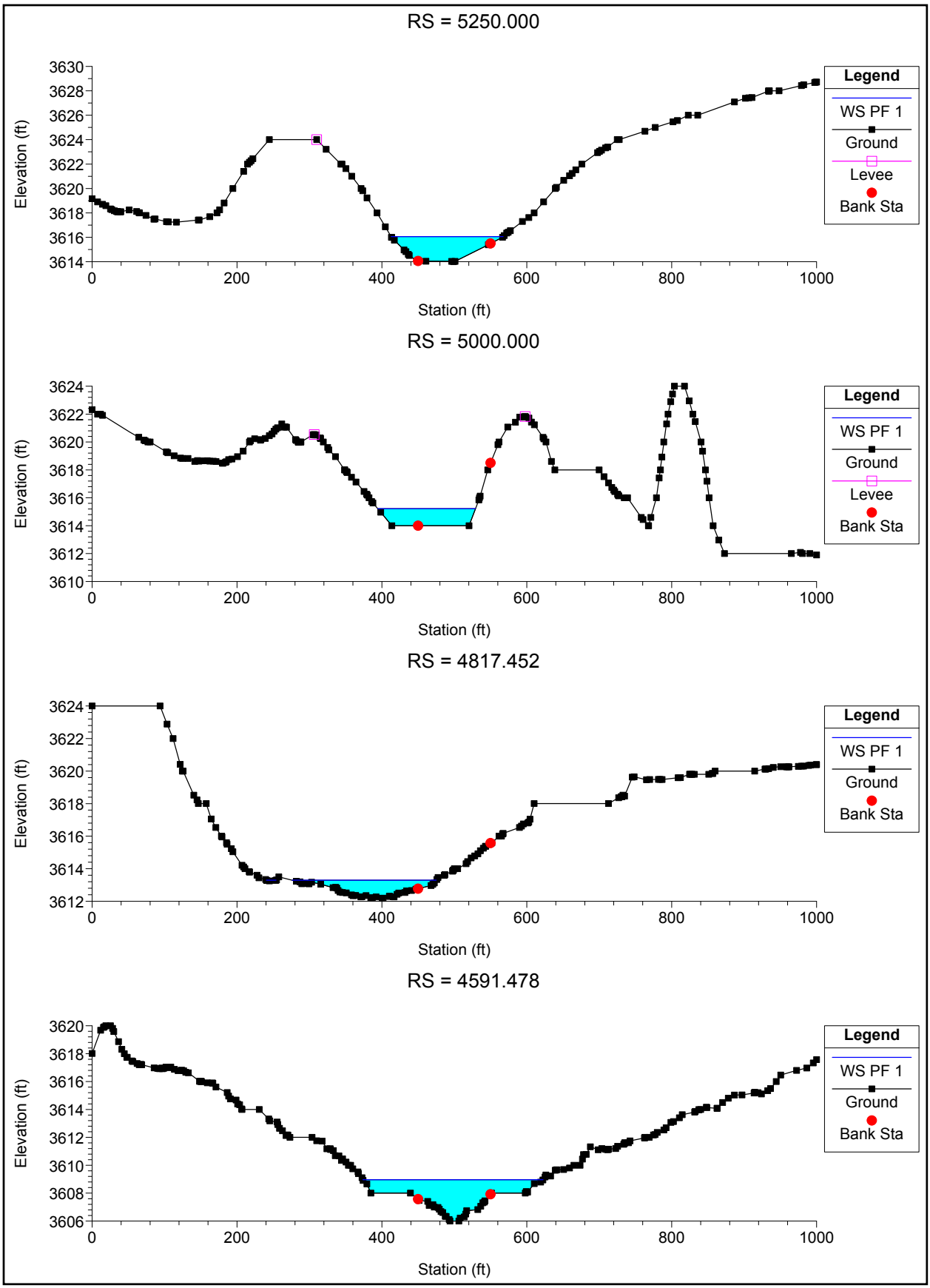
Bank Sta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Ground
Levee
Bank Sta
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Levee
Bank Sta
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Ground
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WS PF 1
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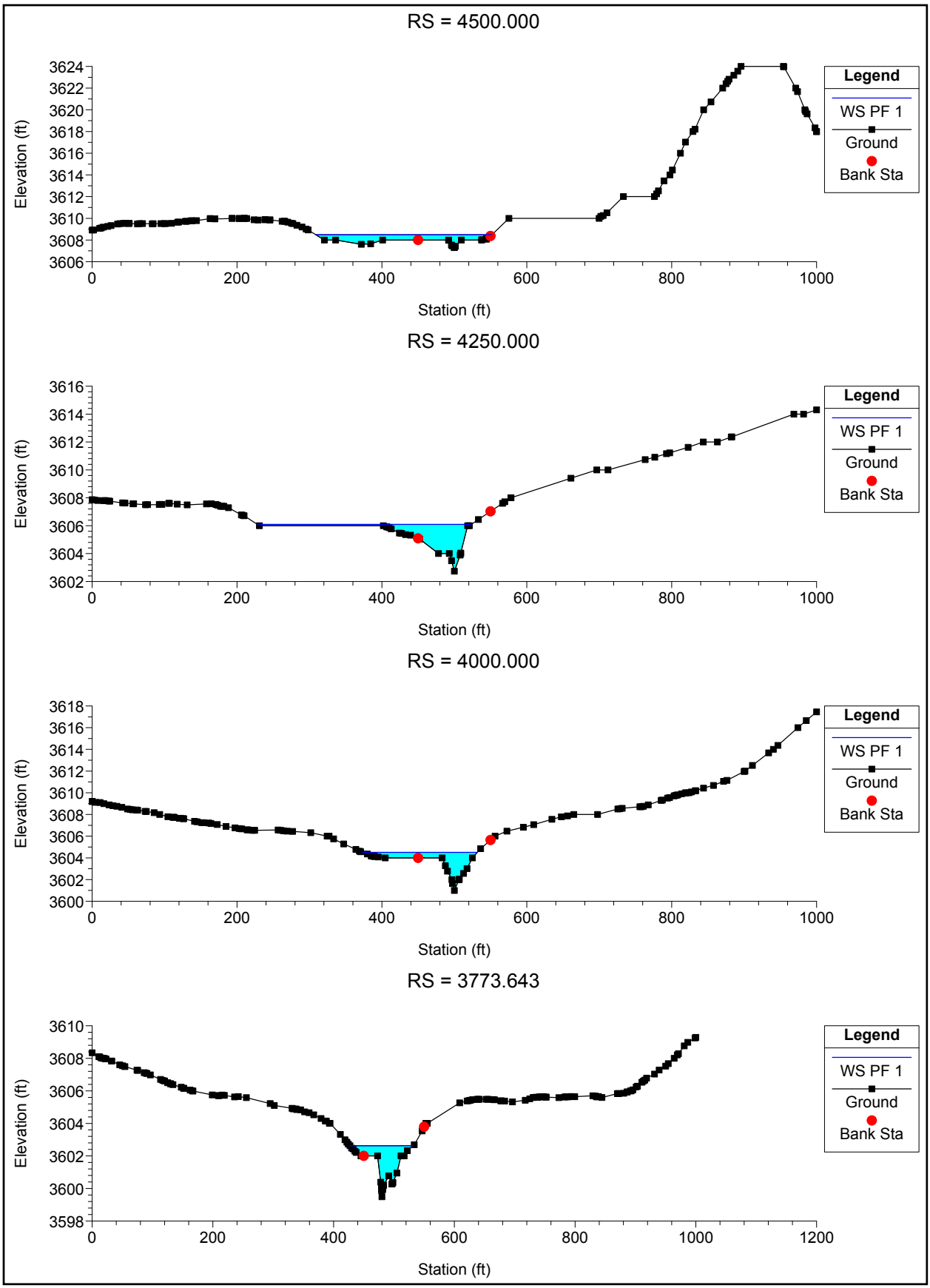
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
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3612
3610
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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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3614
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Station (ft)
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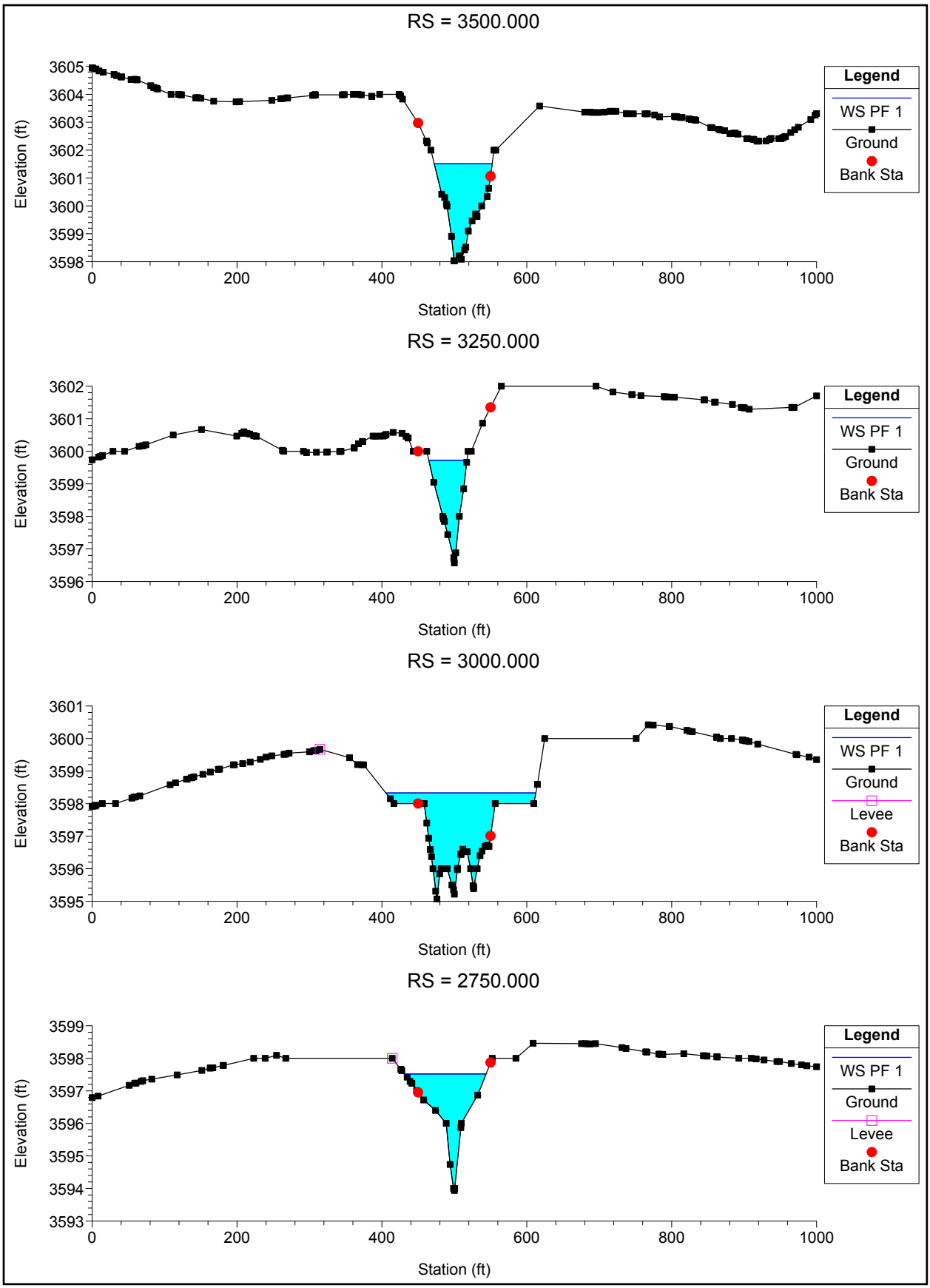
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Ground
Bank Sta
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Elevation (ft)
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3600
3599
3598
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Station (ft)
Legend
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Ground
Bank Sta
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3600
3599
3598
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3596
3595
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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3598
3597
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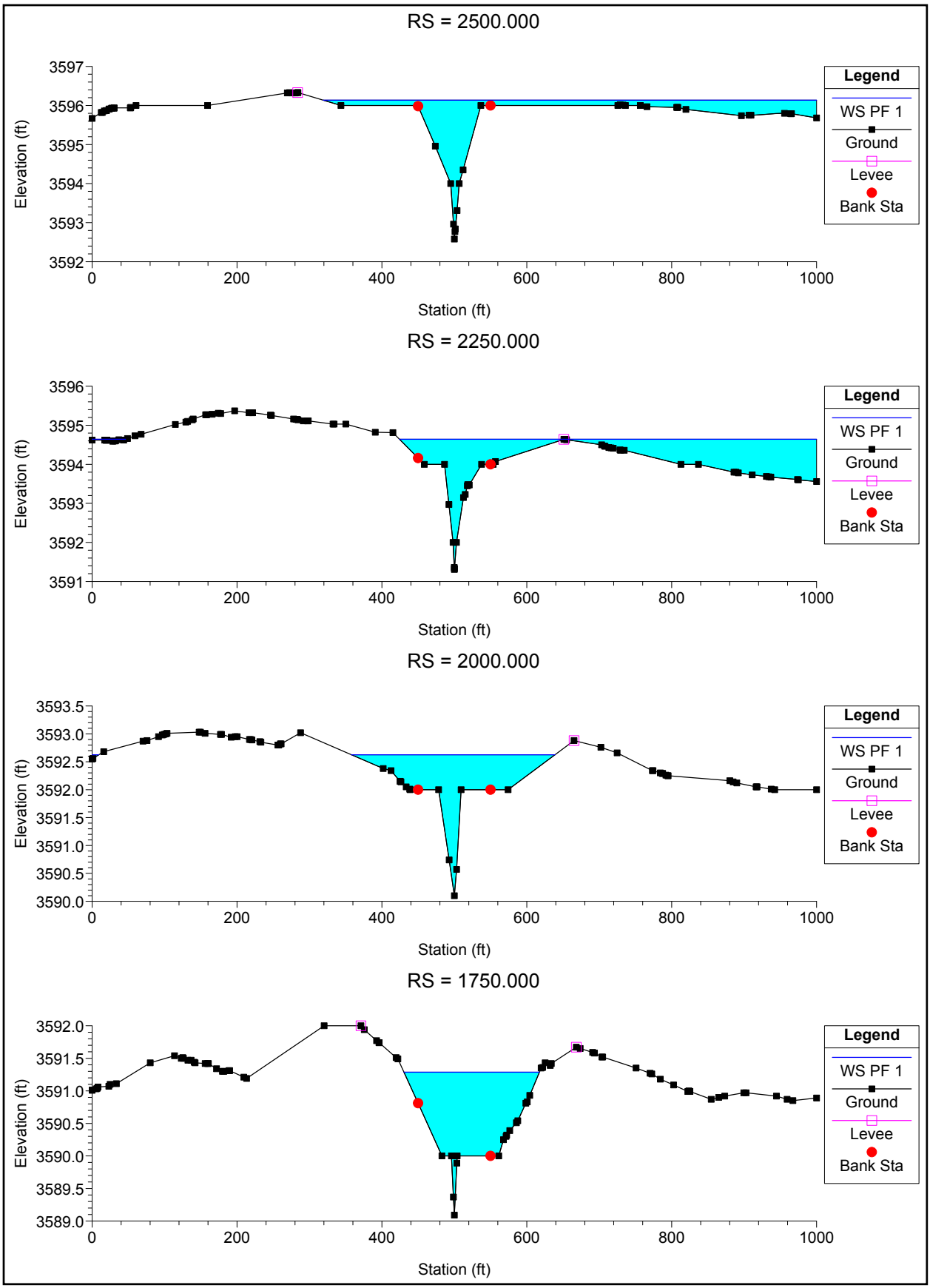
Legend
WS PF 1
Ground
Levee
Bank Sta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Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2250.000
Elevation (ft)
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3595
3594
3593
3592
3591
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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3593.0
3592.5
3592.0
3591.5
3591.0
3590.5
3590.0
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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1000
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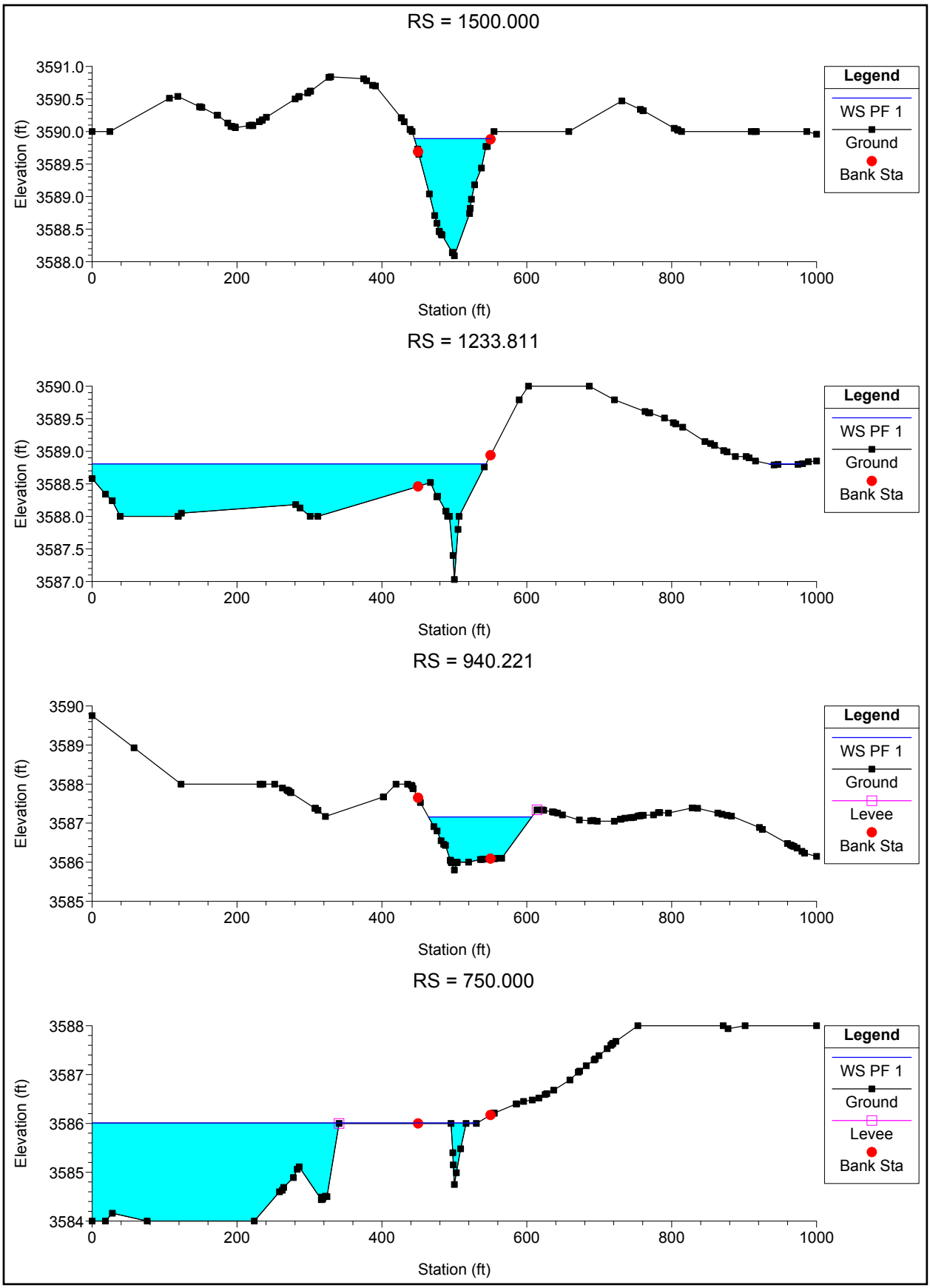
Legend
WS PF 1
Ground
Levee
Bank Sta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800
1000
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Legend
WS PF 1
Ground
Bank Sta
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3589.0
3588.5
3588.0
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Ground
Bank Sta
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Elevation (ft)
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3588
3587
3586
3585
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3588
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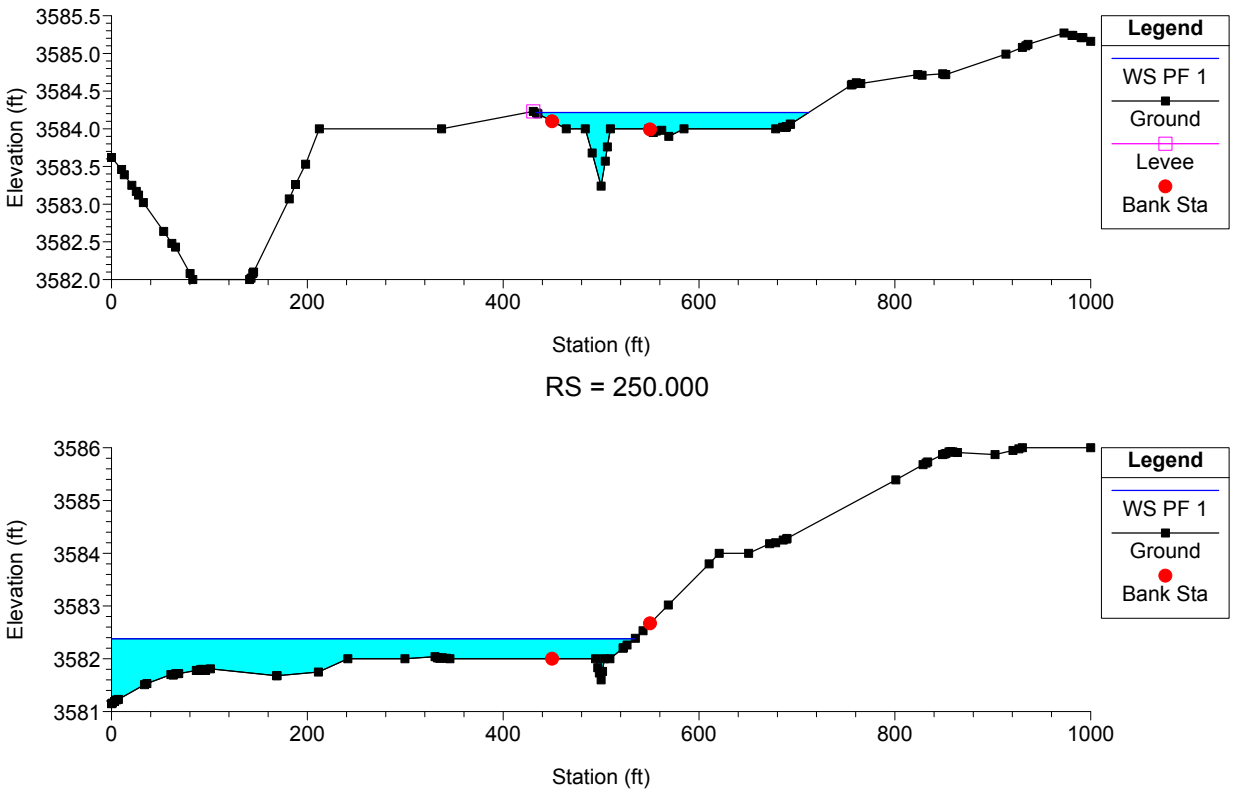
Ground
Levee
Bank Sta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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 250.000
Elevation (ft)
3586
3585
3584
3583
3582
3581
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-21

# HEC-RAS Channel 11

| 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) | |
| 11 | 7000 | PF 1 | 315 | 3707.93 | 3710.01 | 3710.19 | 3710.77 | 0.027015 | 6.99 | 45.07 | 44.7 | 1.23 |
| 11 | 6750 | PF 1 | 315 | 3702.64 | 3703.77 | 3703.84 | 3704.25 | 0.02537 | 5.55 | 56.78 | 76.36 | 1.13 |
| 11 | 6529.806 | PF 1 | 315 | 3696.94 | 3697.63 | 3697.78 | 3698.14 | 0.040033 | 4.63 | 56.2 | 108.16 | 1.29 |
| 11 | 6250 | PF 1 | 315 | 3691.12 | 3693.07 | 3693.07 | 3693.46 | 0.019829 | 5 | 62.94 | 82.05 | 1.01 |
| 11 | 6000 | PF 1 | 315 | 3685.33 | 3687.24 | 3687.48 | 3688.03 | 0.033497 | 7.13 | 44.2 | 50.16 | 1.34 |
| 11 | 5750 | PF 1 | 315 | 3680.2 | 3681.1 | 3681.12 | 3681.46 | 0.023303 | 5.19 | 66.99 | 111.13 | 1.08 |
| 11 | 5500 | PF 1 | 315 | 3672.1 | 3675.08 | 3675.3 | 3676.04 | 0.025746 | 7.88 | 40 | 31.57 | 1.23 |
| 11 | 5250 | PF 1 | 315 | 3667.89 | 3670.4 | 3670.47 | 3671.08 | 0.019905 | 6.58 | 47.85 | 41.19 | 1.08 |
| 11 | 5024.913 | PF 1 | 315 | 3664.89 | 3667.14 | 3667.14 | 3667.53 | 0.018861 | 5.05 | 62.32 | 76.92 | 0.99 |
| 11 | 4750 | PF 1 | 315 | 3660 | 3661.3 | 3661.39 | 3661.83 | 0.025566 | 5.95 | 54.36 | 70.4 | 1.16 |
| 11 | 4500 | PF 1 | 315 | 3655.94 | 3657.32 | 3657.16 | 3657.66 | 0.011447 | 4.65 | 67.78 | 65.37 | 0.8 |
| 11 | 4250 | PF 1 | 315 | 3651.95 | 3653.68 | 3653.68 | 3654.13 | 0.019232 | 5.39 | 58.49 | 66.76 | 1.01 |
| 11 | 4000 | PF 1 | 315 | 3647.53 | 3649.97 | 3649.74 | 3650.32 | 0.010529 | 4.79 | 65.82 | 56.92 | 0.78 |
| 11 | 3750 | PF 1 | 315 | 3645.23 | 3647.62 | 3647.41 | 3647.86 | 0.010205 | 3.89 | 81.1 | 95.6 | 0.74 |
| 11 | 3500 | PF 1 | 315 | 3643.3 | 3644.49 | 3644.49 | 3644.8 | 0.018371 | 4.81 | 72.21 | 114.32 | 0.97 |
| 11 | 3250 | PF 1 | 315 | 3638 | 3639.95 | 3639.95 | 3640.57 | 0.016888 | 6.36 | 49.54 | 39.75 | 1 |
| 11 | 3000 | PF 1 | 315 | 3637.8 | 3639.52 | 3638.6 | 3639.56 | 0.00085 | 1.6 | 217.23 | 174.61 | 0.23 |
| 11 | 2770.878 | PF 1 | 315 | 3638 | 3638.69 | 3638.69 | 3639 | 0.020928 | 4.5 | 70.32 | 112.87 | 1 |
| 11 | 2711.211 | PF 1 | 342 | 3631.92 | 3633.04 | 3633.8 | 3636 | 0.161904 | 13.8 | 24.78 | 34.01 | 2.85 |
| 11 | 2500 | PF 1 | 342 | 3627.63 | 3630.83 | 3630.71 | 3631.35 | 0.013381 | 5.82 | 58.8 | 45.1 | 0.9 |
| 11 | 2250 | PF 1 | 342 | 3624.98 | 3627.82 | 3627.82 | 3628.5 | 0.016405 | 6.62 | 51.64 | 37.99 | 1 |
| 11 | 2000 | PF 1 | 342 | 3621.41 | 3624.23 | 3623.91 | 3624.49 | 0.009369 | 4.13 | 85.92 | 104.47 | 0.72 |
| 11 | 1750 | PF 1 | 342 | 3619.03 | 3622.35 | 3622.35 | 3622.67 | 0.012918 | 4.84 | 82.13 | 128.88 | 0.85 |
| 11 | 1508.185 | PF 1 | 342 | 3616.58 | 3619.51 | 3618.83 | 3619.59 | 0.002604 | 2.16 | 155.61 | 151.74 | 0.38 |
| 11 | 1250 | PF 1 | 529 | 3614.16 | 3617.46 | 3617.46 | 3618.07 | 0.014415 | 6.31 | 86.76 | 82.62 | 0.94 |
| 11 | 1000 | PF 1 | 529 | 3610.54 | 3614.57 | 3614.16 | 3615.17 | 0.009402 | 6.17 | 85.68 | 45.74 | 0.79 |
| 11 | 750 | PF 1 | 529 | 3607.78 | 3611.51 | 3611.51 | 3612.53 | 0.014048 | 8.13 | 65.38 | 32.64 | 0.99 |
| 11 | 583.892 | PF 1 | 529 | 3606.36 | 3610.56 | 3610.29 | 3610.62 | 0.002353 | 2.36 | 305.59 | 461.07 | 0.37 |
| 11 | 516.955 | PF 1 | 529 | 3605.77 | 3609.4 | 3609.4 | 3610.23 | 0.015139 | 7.31 | 72.43 | 44.13 | 0.99 |
| 11 | 250 | PF 1 | 529 | 3603.02 | 3606 | 3606.01 | 3606.14 | 0.016394 | 3.64 | 185.06 | 499.63 | 0.86 |
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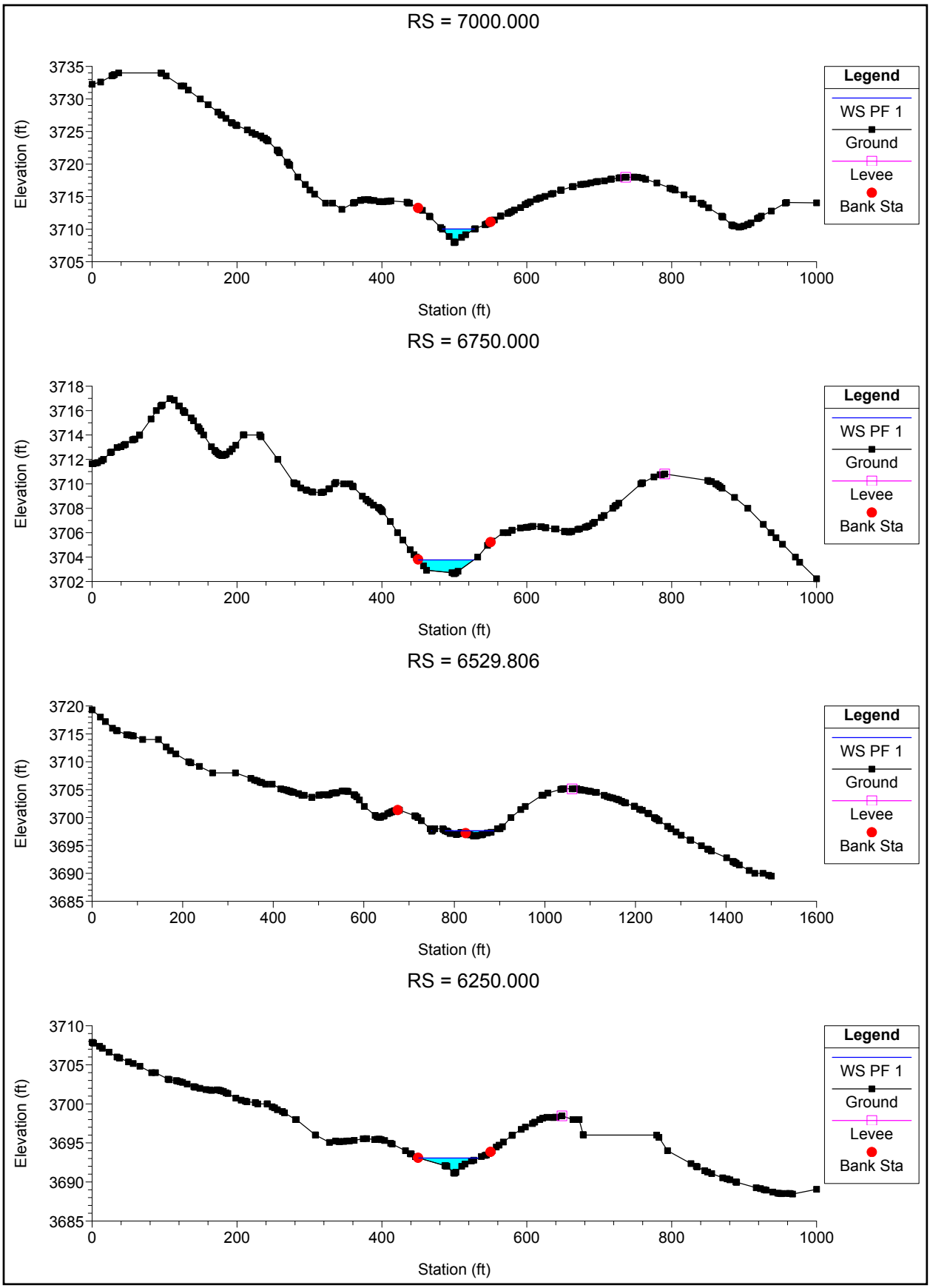
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800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6750.000
Elevation (ft)
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3708
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800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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600
800
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1400
1600
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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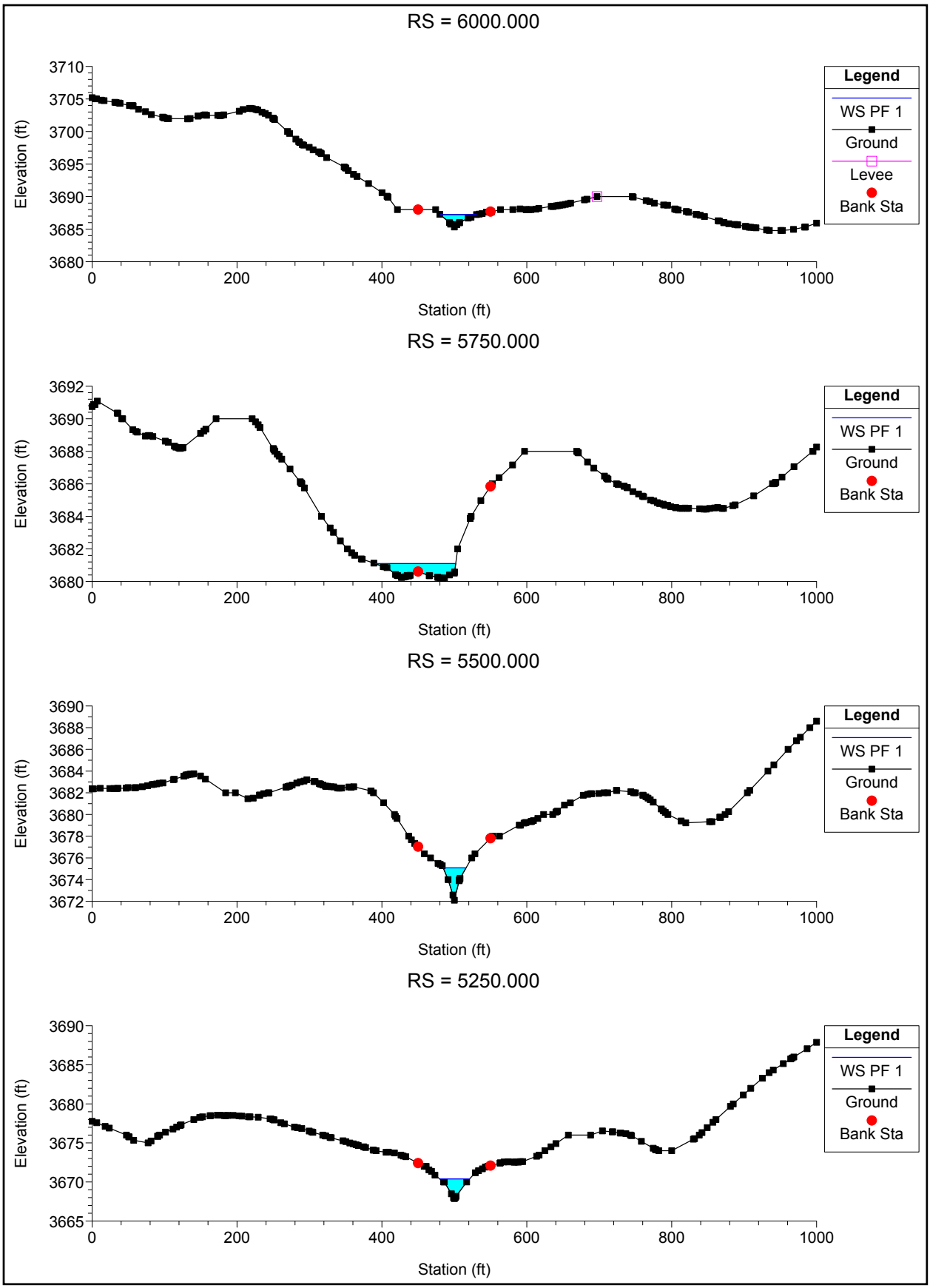
Bank Sta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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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Elevation (ft)
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800
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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Ground
Bank Sta
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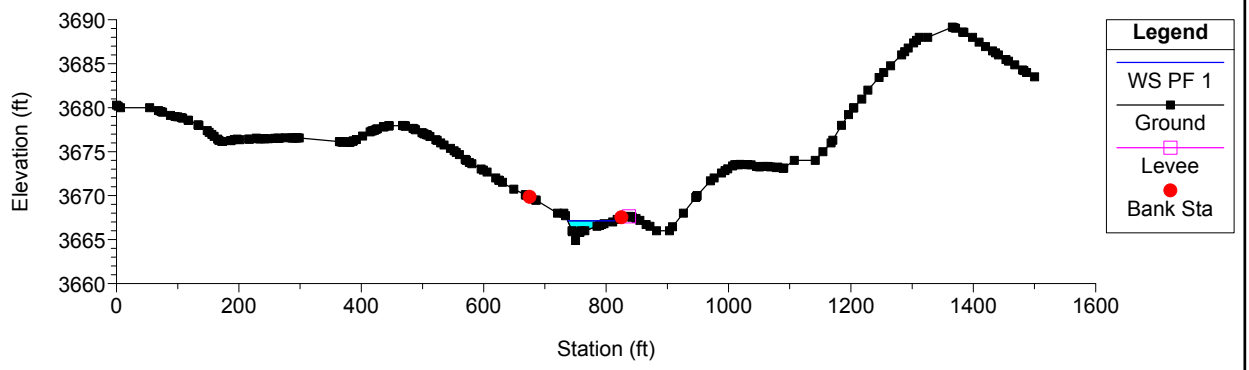


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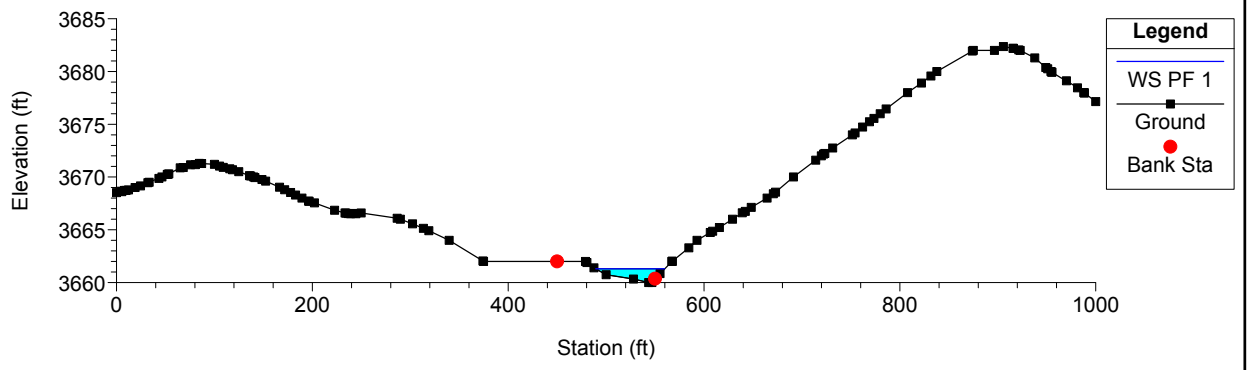


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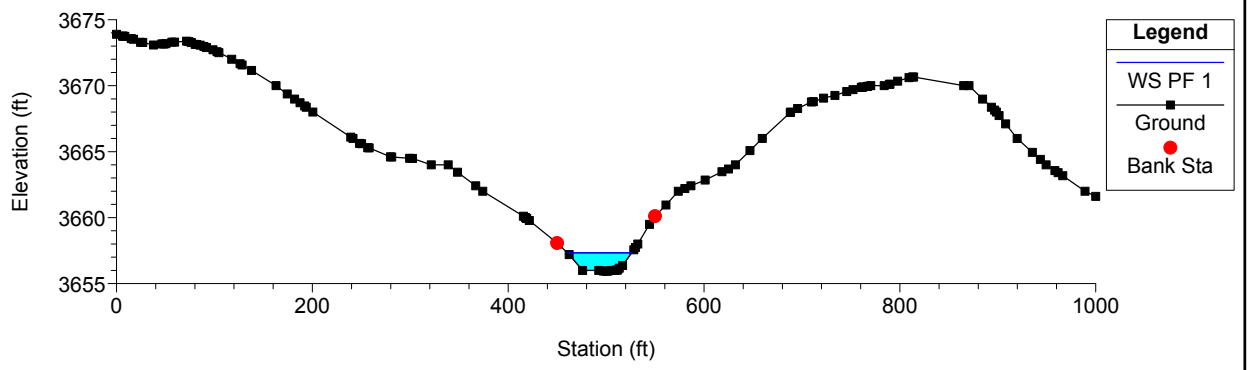


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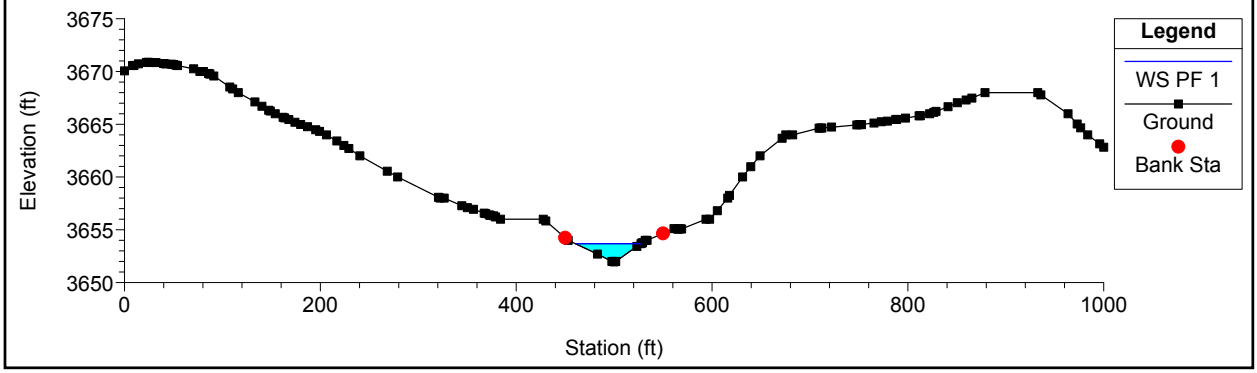

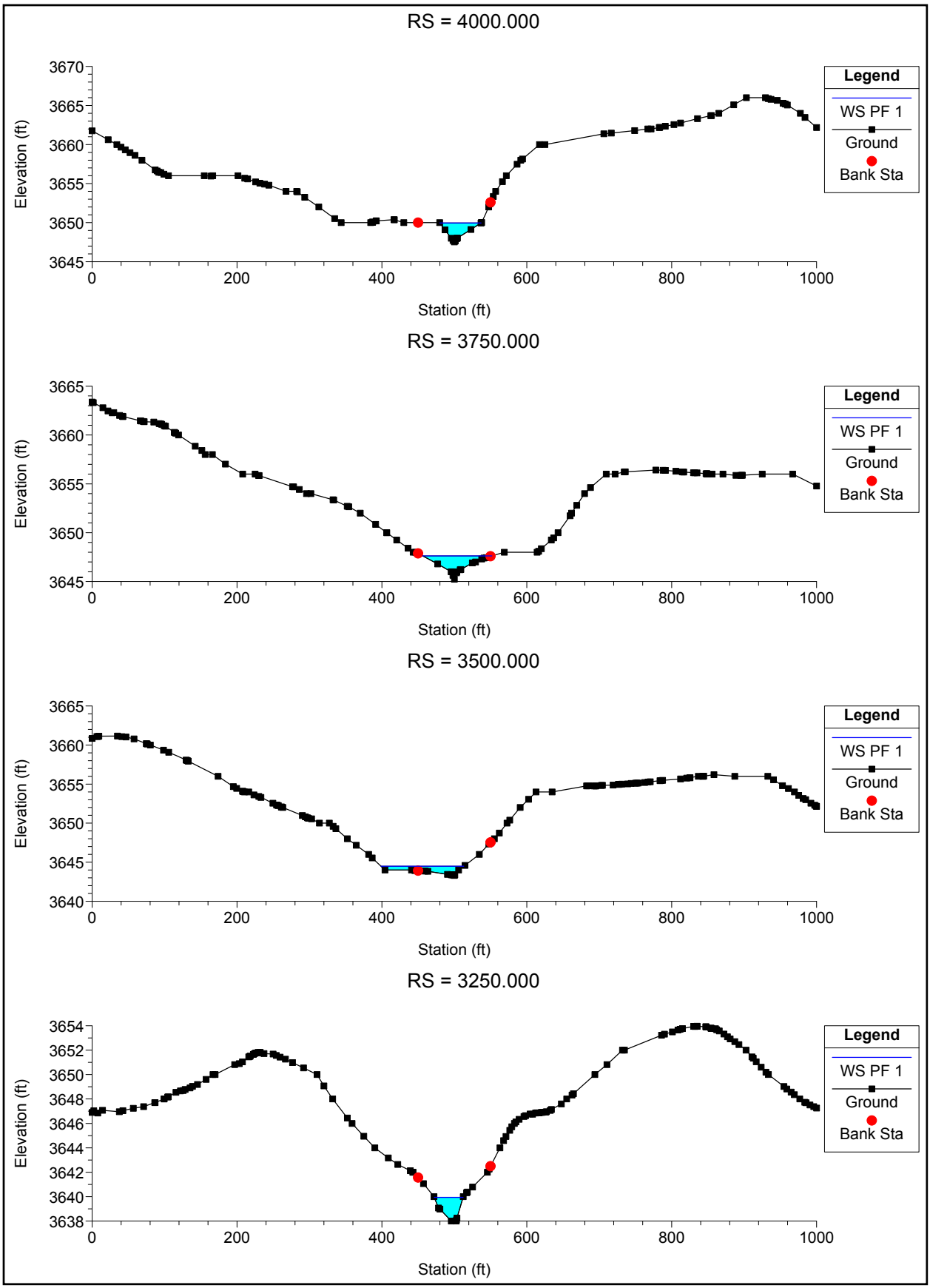
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Ground
Bank Sta
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Elevation (ft)
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600
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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Station (ft)
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Ground
Bank Sta
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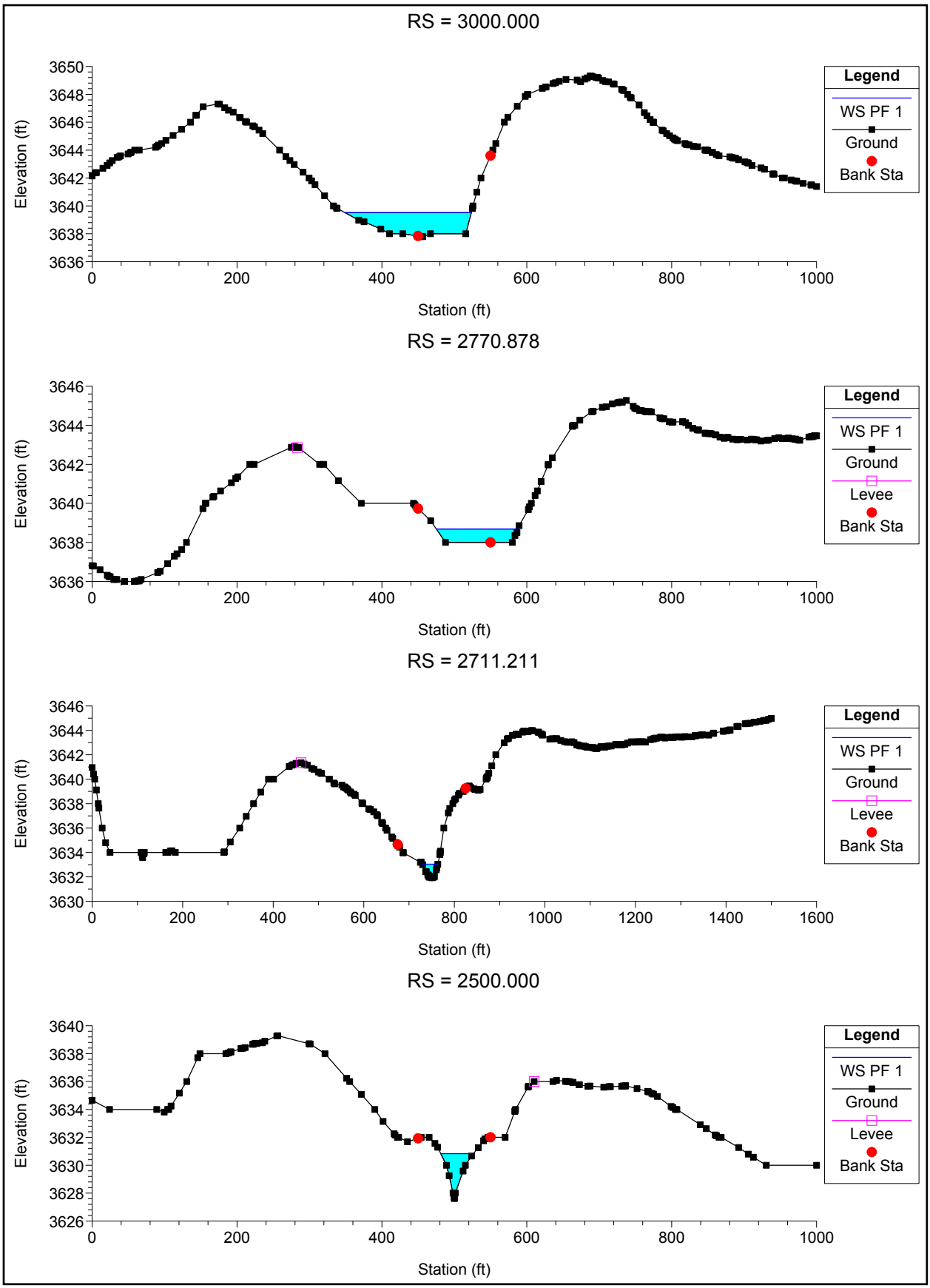
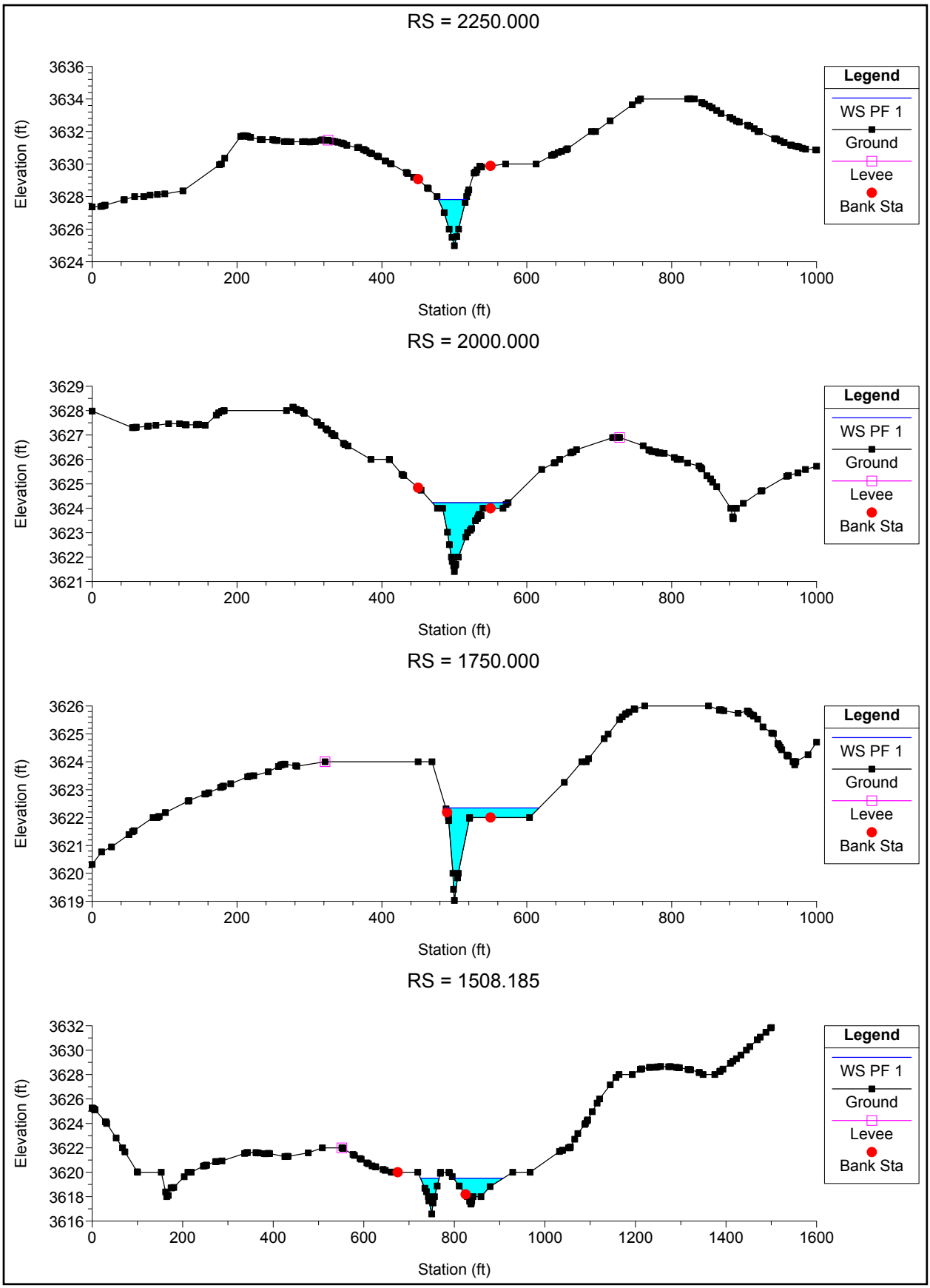
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 3000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2770.878
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2711.211
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
3636
3634
3632
3630
3628
3626
3624
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2000.000
Elevation (ft)
3629
3628
3627
3626
3625
3624
3623
3622
3621
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
3626
3625
3624
3623
3622
3621
3620
3619
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1508.185
Elevation (ft)
3632
3630
3628
3626
3624
3622
3620
3618
3616
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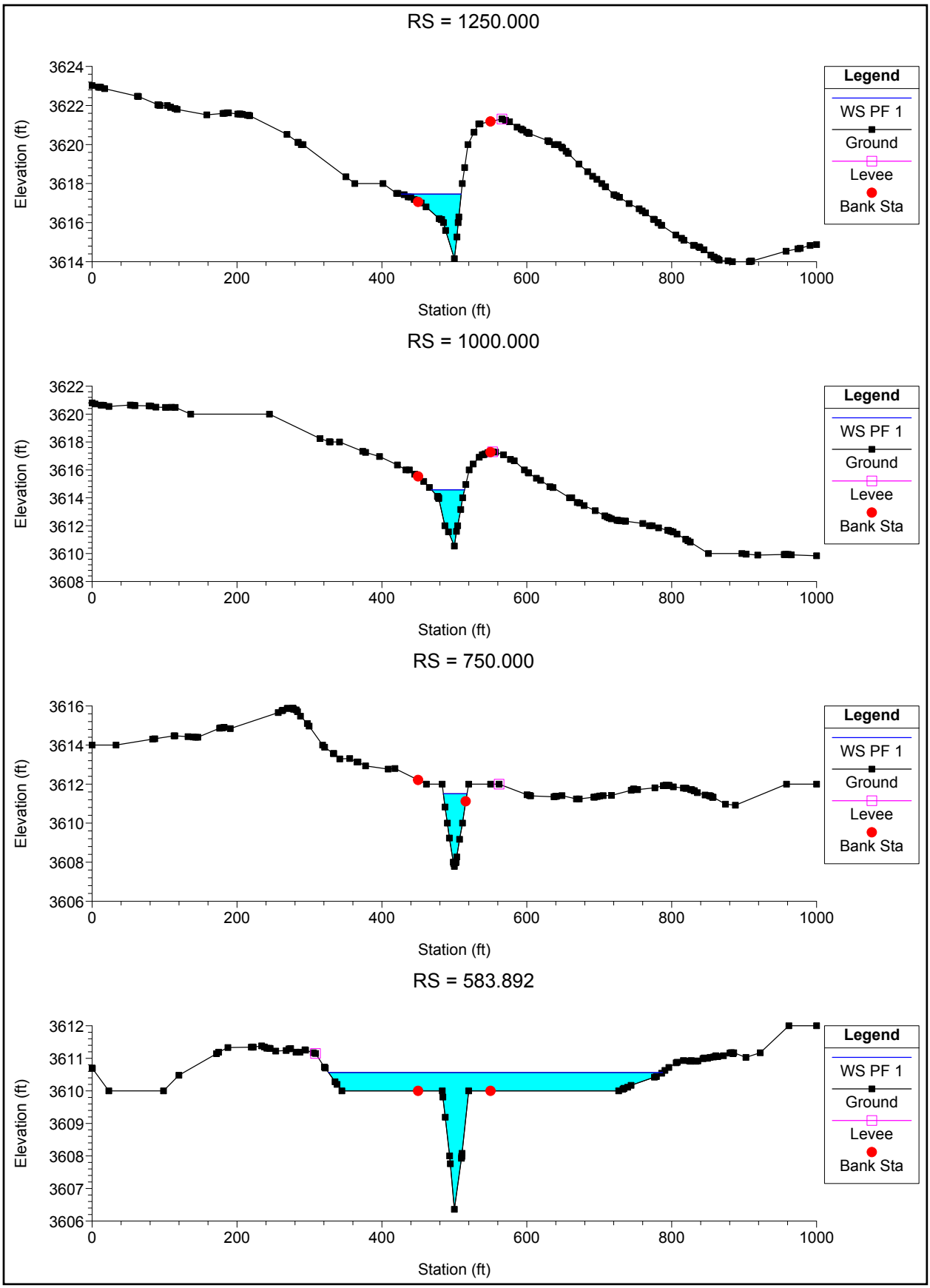
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3620
3618
3616
3614
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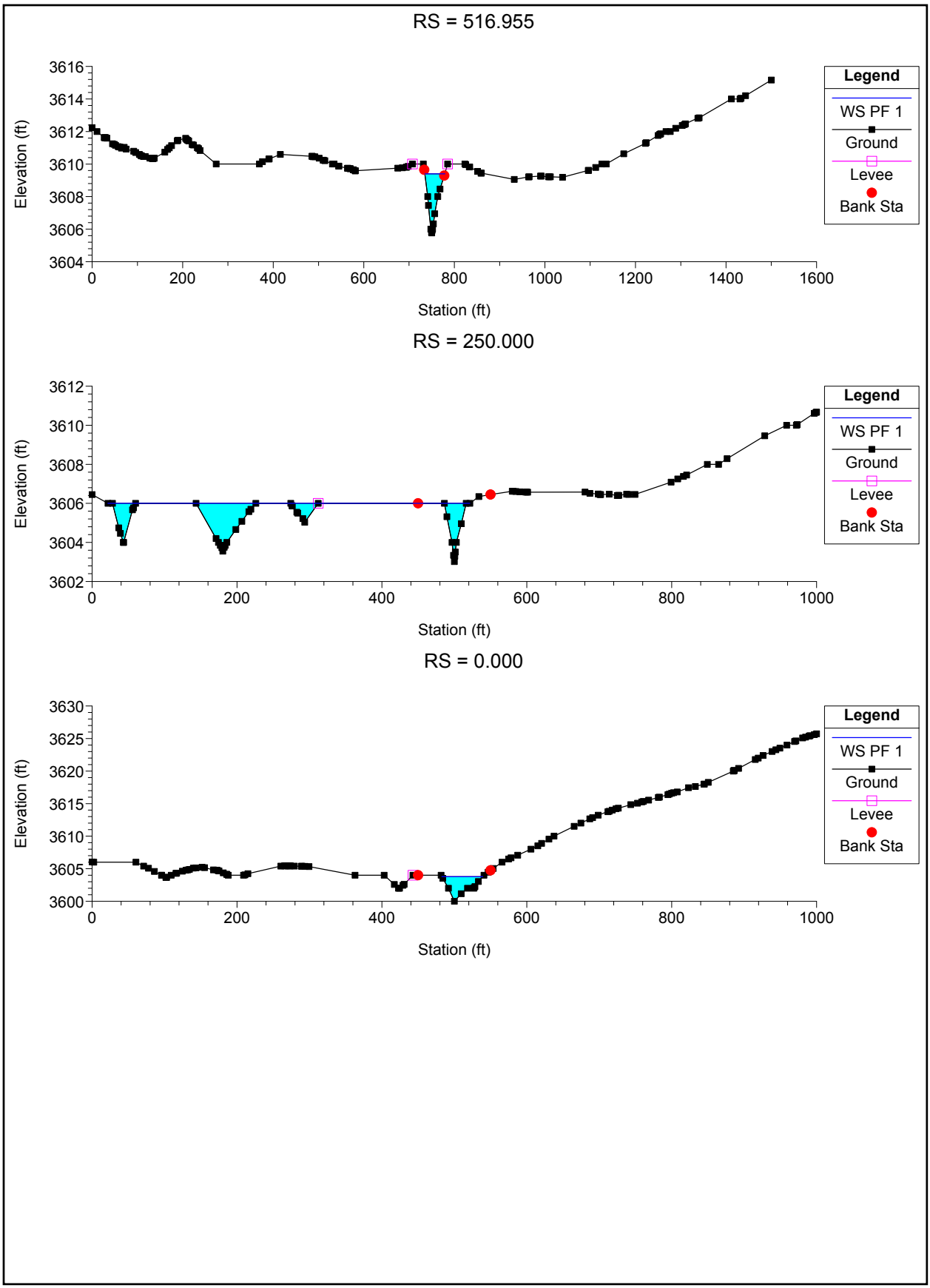
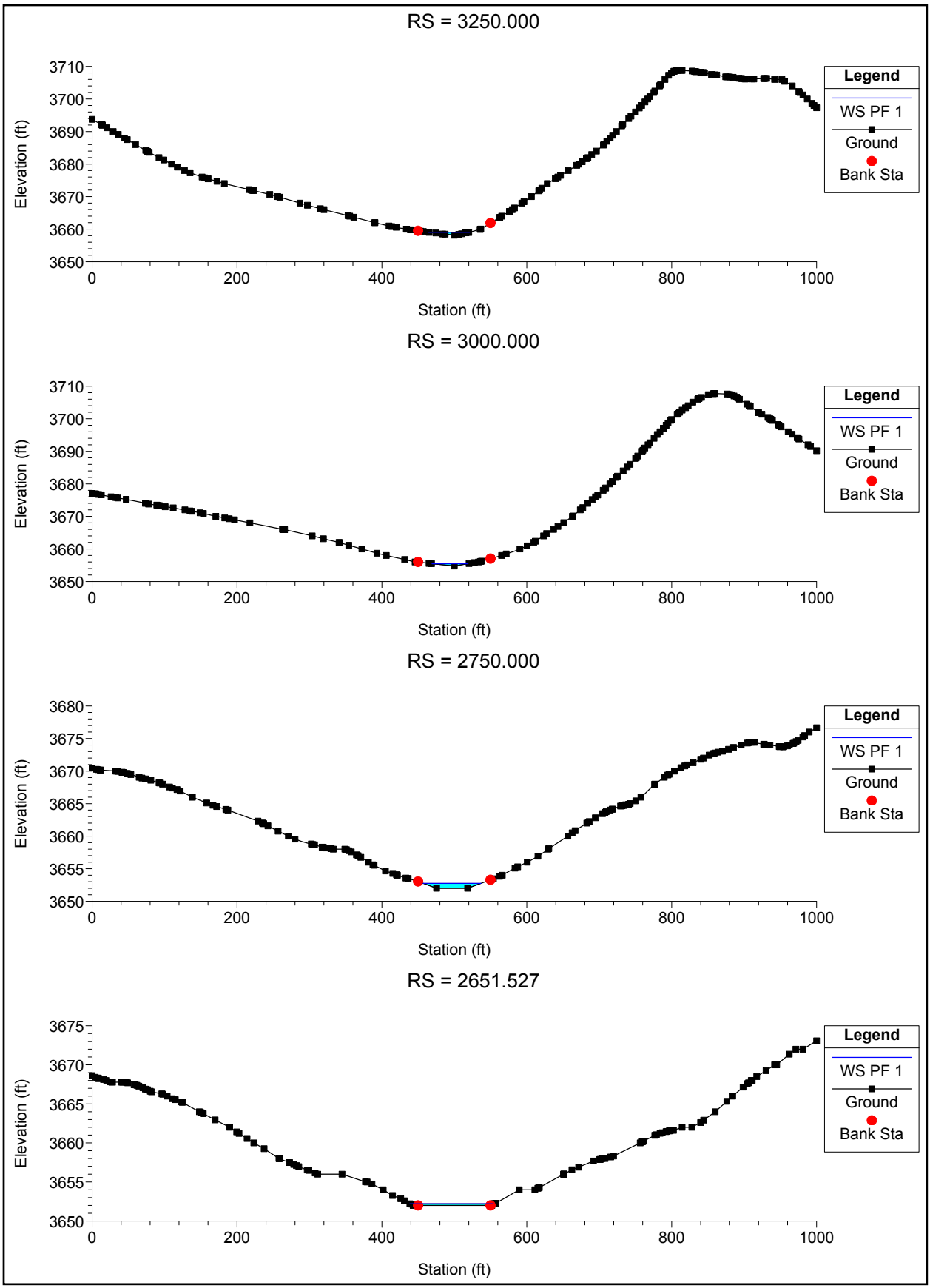
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
3622
3620
3618
3616
3614
3612
3610
3608
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3616
3614
3612
3610
3608
3606
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 583.892
Elevation (ft)
3612
3611
3610
3609
3608
3607
3606
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 516.955
Elevation (ft)
3616
3614
3612
3610
3608
3606
3604
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3612
3610
3608
3606
3604
3602
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3630
3625
3620
3615
3610
3605
3600
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-22

# HEC-RAS Channel 11A

| 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) | |
| 11A | 3250 | PF 1 | 59 | 3658.15 | 3659.06 | 3658.89 | 3659.14 | 0.008604 | 2.31 | 25.59 | 57.11 | 0.61 |
| 11A | 3000 | PF 1 | 59 | 3654.78 | 3655.47 | 3655.47 | 3655.65 | 0.026562 | 3.41 | 17.29 | 49.88 | 1.02 |
| 11A | 2750 | PF 1 | 59 | 3652 | 3652.76 | 3652.36 | 3652.78 | 0.001866 | 1.28 | 46.25 | 79.7 | 0.3 |
| 11A | 2651.527 | PF 1 | 59 | 3652 | 3652.21 | 3652.21 | 3652.31 | 0.029825 | 2.59 | 23.27 | 115.34 | 1 |
| 11A | 2500 | PF 1 | 197 | 3647.13 | 3648.5 | 3648.33 | 3648.69 | 0.010901 | 3.49 | 56.38 | 80.52 | 0.74 |
| 11A | 2250 | PF 1 | 197 | 3643.67 | 3644.72 | 3644.72 | 3644.98 | 0.023356 | 4.07 | 48.35 | 97.11 | 1.02 |
| 11A | 2000 | PF 1 | 197 | 3640.36 | 3641.06 | 3640.91 | 3641.16 | 0.008442 | 2.68 | 78.59 | 153.58 | 0.63 |
| 11A | 1750 | PF 1 | 197 | 3636.41 | 3637.79 | 3637.79 | 3638.07 | 0.022726 | 4.2 | 46.98 | 91.42 | 1.01 |
| 11A | 1500 | PF 1 | 197 | 3633.96 | 3634.11 | 3633.89 | 3634.16 | 0.006014 | 0.68 | 111.93 | 327.78 | 0.39 |
| 11A | 1250 | PF 1 | 197 | 3630.93 | 3631.65 | 3631.62 | 3631.81 | 0.019431 | 3.32 | 61.92 | 159.87 | 0.9 |
| 11A | 1000 | PF 1 | 197 | 3628 | 3628.54 | 3628.42 | 3628.61 | 0.008932 | 2.05 | 89.46 | 221.43 | 0.6 |
| 11A | 750 | PF 1 | 197 | 3624.31 | 3625.81 | 3625.74 | 3626.05 | 0.014661 | 3.95 | 50.64 | 85.59 | 0.85 |
| 11A | 500 | PF 1 | 197 | 3621.56 | 3622.45 | | 3622.58 | 0.013819 | 3 | 67.63 | 151.97 | 0.77 |
| 11A | 250 | PF 1 | 197 | 3617.96 | 3619.9 | 3619.74 | 3620.09 | 0.009174 | 3.55 | 58.29 | 96.27 | 0.69 |
| 11A | 0 | PF 1 | 197 | 3614.7 | 3617.1 | 3616.93 | 3617.5 | 0.012 | 5.05 | 39.02 | 34.08 | 0.83 |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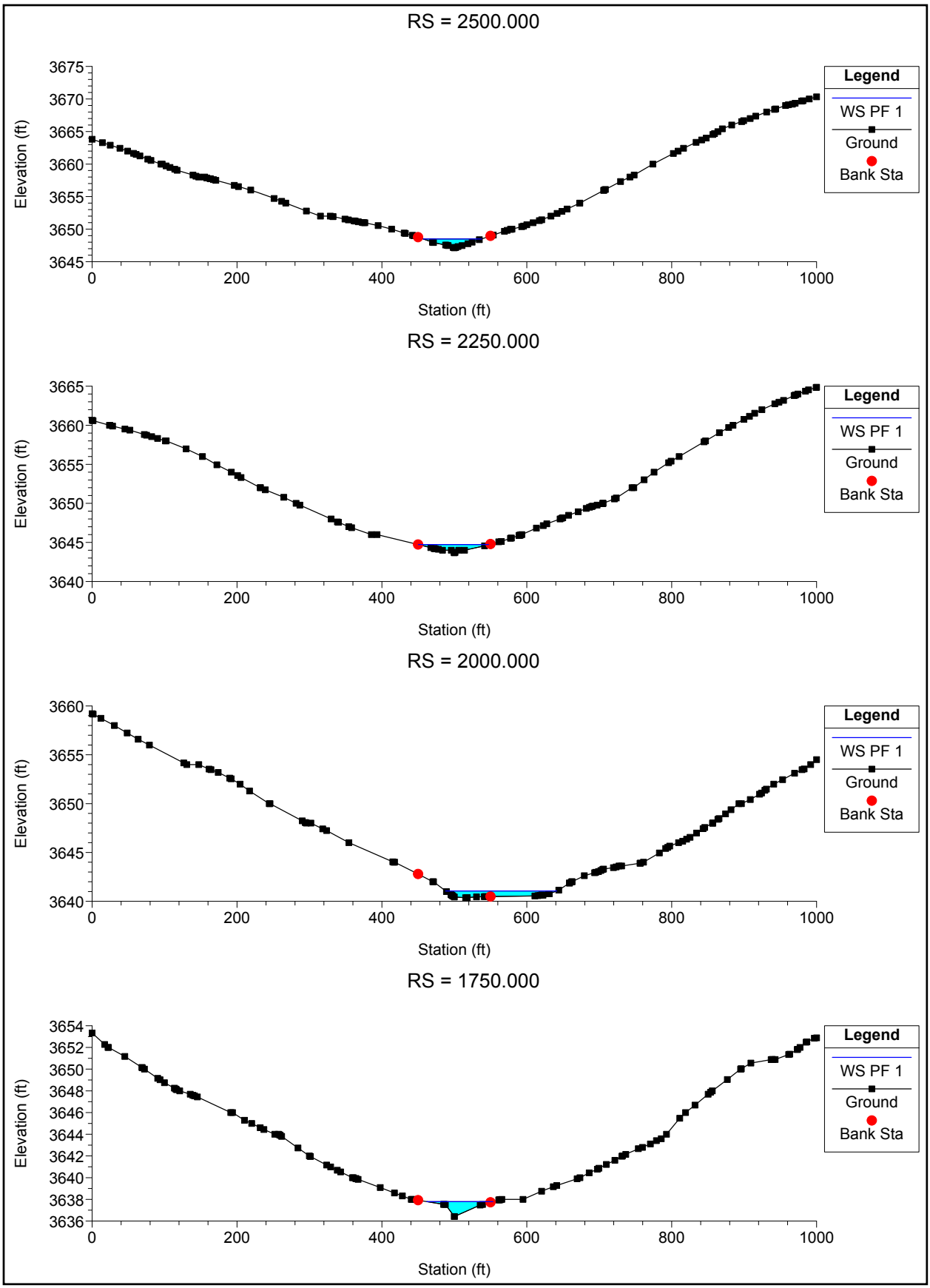
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2651.527
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3665
3660
3655
3650
3645
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200
400
600
800
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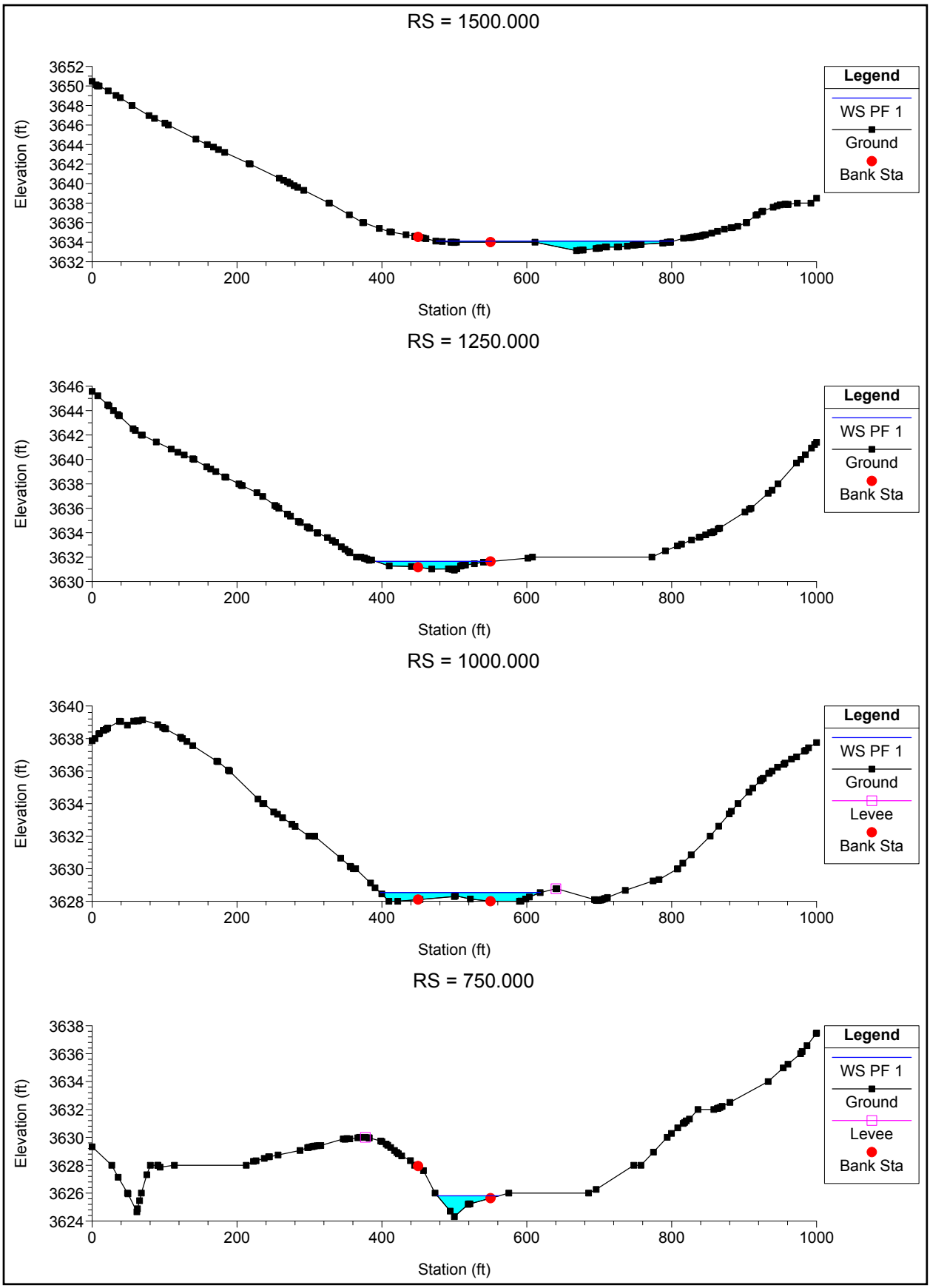
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3665
3660
3655
3650
3645
3640
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
3660
3655
3650
3645
3640
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3654
3652
3650
3648
3646
3644
3642
3640
3638
3636
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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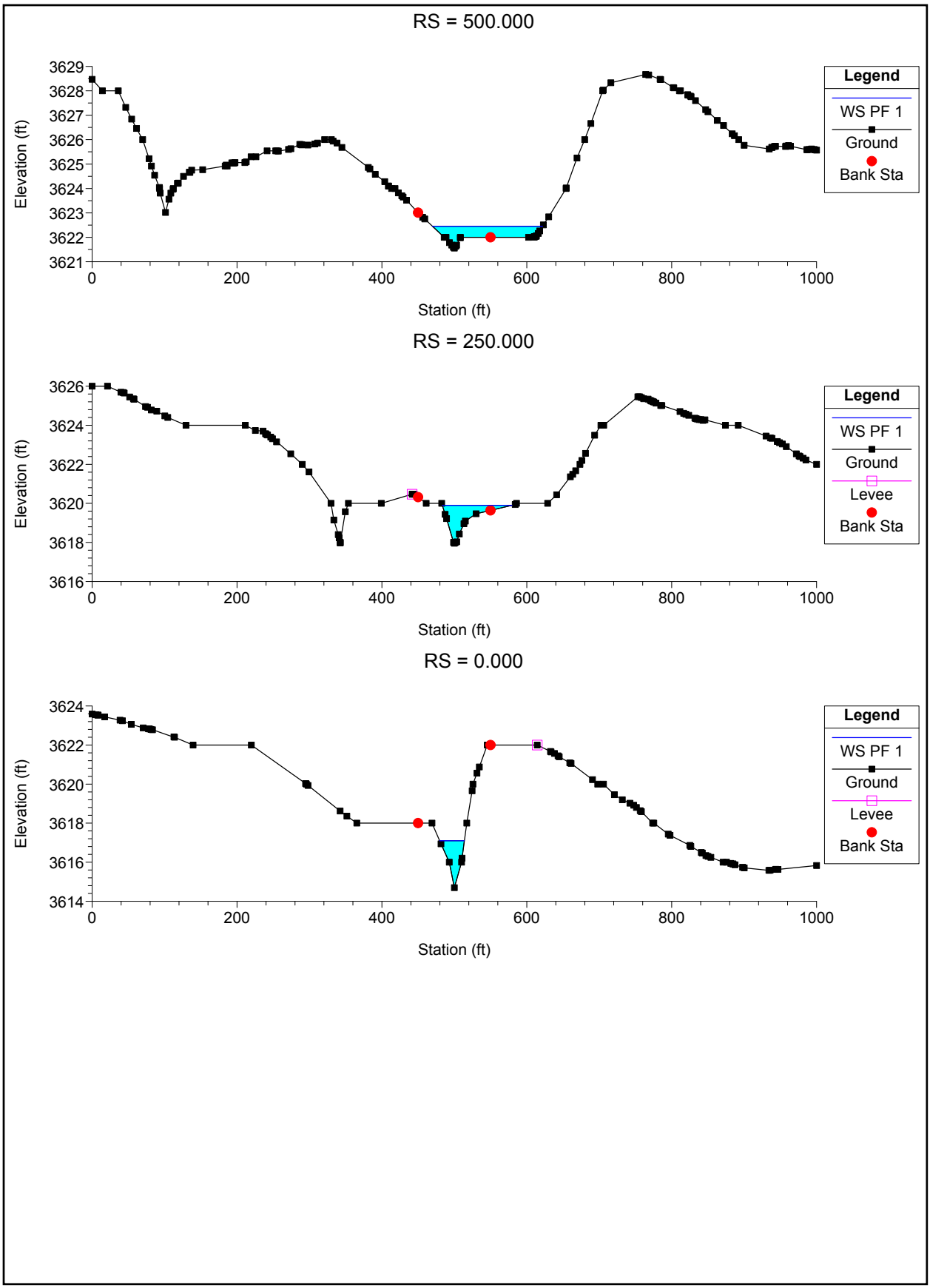
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 500.000
Elevation (ft)
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3625
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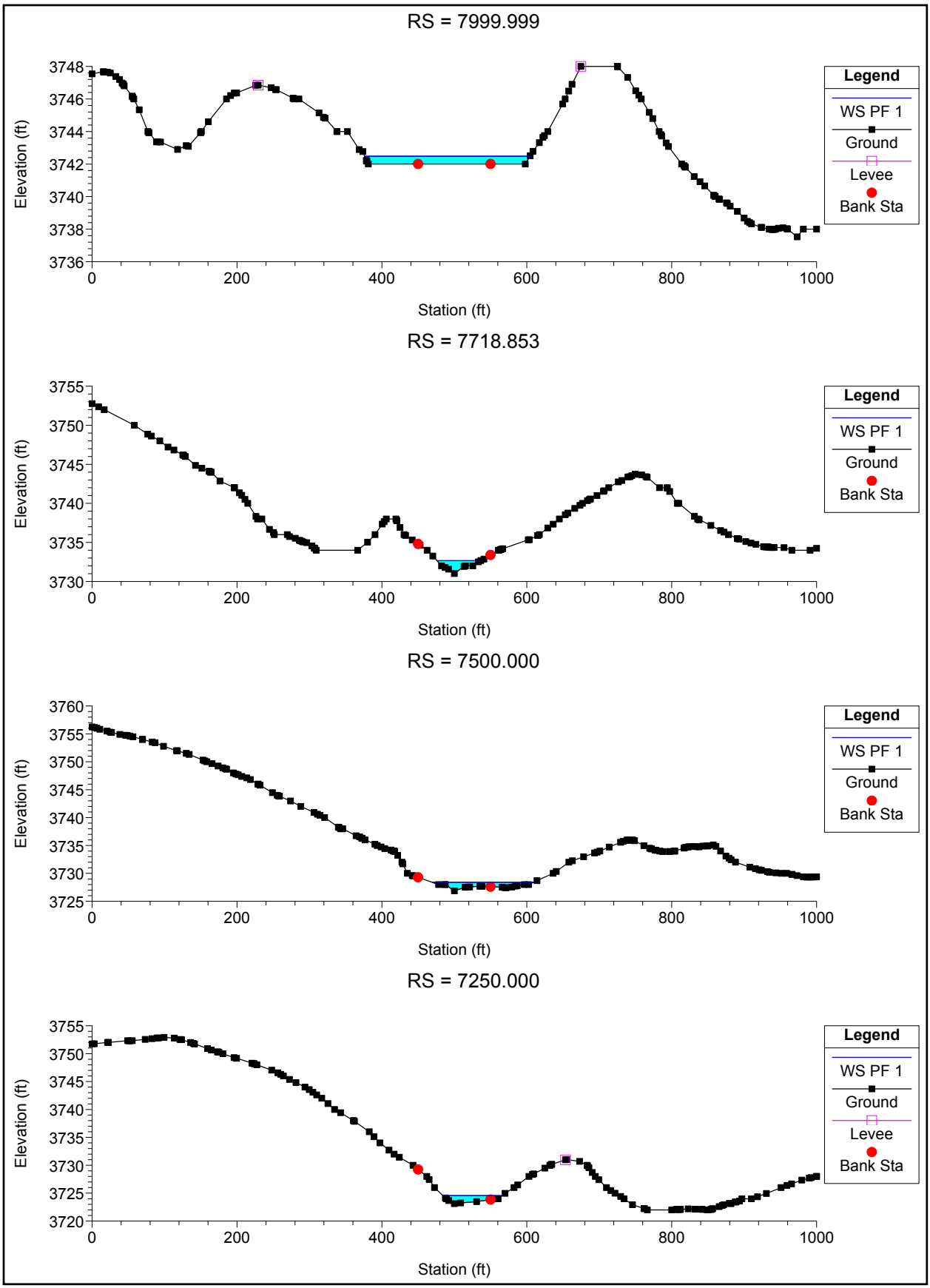
3621
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3626
3624
3622
3620
3618
3616
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3624
3622
3620
3618
3616
3614
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-23

# HEC-RAS Channel 12

| 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) | |
| 12 | 7999.999 | PF 1 | 413 | 3742 | 3742.48 | 3742.48 | 3742.71 | 0.022715 | 3.93 | 106.93 | 228.07 | 1 |
| 12 | 7718.853 | PF 1 | 413 | 3731.02 | 3732.66 | 3733.01 | 3733.77 | 0.052436 | 8.46 | 48.84 | 60.08 | 1.65 |
| 12 | 7500 | PF 1 | 413 | 3726.86 | 3728.39 | 3728.29 | 3728.65 | 0.013987 | 4.23 | 101.34 | 139.15 | 0.85 |
| 12 | 7250 | PF 1 | 413 | 3723.11 | 3724.56 | 3724.56 | 3725.03 | 0.016705 | 5.63 | 76.49 | 81.79 | 0.97 |
| 12 | 7000 | PF 1 | 413 | 3719.15 | 3720.49 | 3720.5 | 3720.91 | 0.018123 | 5.35 | 82.35 | 105.25 | 0.99 |
| 12 | 6720.049 | PF 1 | 413 | 3709.38 | 3711.04 | 3711.62 | 3712.92 | 0.057536 | 11.01 | 37.51 | 33.08 | 1.82 |
| 12 | 6500 | PF 1 | 413 | 3704 | 3706.06 | 3706.07 | 3706.79 | 0.016657 | 6.87 | 60.14 | 42.51 | 1.02 |
| 12 | 6250 | PF 1 | 413 | 3704 | 3706.14 | 3704.68 | 3706.17 | 0.000414 | 1.44 | 304.76 | 157.47 | 0.17 |
| 12 | 6000 | PF 1 | 413 | 3704 | 3706.02 | | 3706.06 | 0.000541 | 1.58 | 270.59 | 141.51 | 0.2 |
| 12 | 5926.549 | PF 1 | 413 | 3704 | 3705.37 | 3705.37 | 3705.89 | 0.01792 | 5.82 | 70.99 | 68.42 | 1.01 |
| 12 | 5726.165 | PF 1 | 601 | 3690.6 | 3692.1 | 3692.79 | 3695.1 | 0.224699 | 13.91 | 43.21 | 75.1 | 3.23 |
| 12 | 5500 | PF 1 | 601 | 3684.08 | 3687.65 | 3687.65 | 3688.66 | 0.014621 | 8.05 | 74.62 | 37.16 | 1 |
| 12 | 5250 | PF 1 | 601 | 3672.76 | 3677 | 3678.41 | 3681.51 | 0.069142 | 17.03 | 35.29 | 16.6 | 2.06 |
| 12 | 5000 | PF 1 | 601 | 3666.5 | 3670.94 | 3671.22 | 3672.64 | 0.019017 | 10.44 | 57.55 | 22.3 | 1.15 |
| 12 | 4750 | PF 1 | 601 | 3662.44 | 3666.67 | 3666.93 | 3668.29 | 0.019081 | 10.23 | 58.73 | 23.88 | 1.15 |
| 12 | 4500 | PF 1 | 601 | 3658.55 | 3661.63 | 3662.24 | 3663.71 | 0.033039 | 11.57 | 51.94 | 27.44 | 1.48 |
| 12 | 4250 | PF 1 | 601 | 3655 | 3658.53 | 3658.46 | 3659.57 | 0.013299 | 8.18 | 73.49 | 33.09 | 0.97 |
| 12 | 4000 | PF 1 | 601 | 3652.2 | 3655.11 | 3655.11 | 3656.02 | 0.01529 | 7.65 | 78.52 | 44.01 | 1.01 |
| 12 | 3750 | PF 1 | 601 | 3649.04 | 3652.24 | 3651.87 | 3652.67 | 0.008853 | 5.25 | 114.91 | 77.33 | 0.75 |
| 12 | 3500 | PF 1 | 601 | 3646.24 | 3649.12 | 3649.12 | 3649.93 | 0.015309 | 7.19 | 83.55 | 51.78 | 1 |
| 12 | 3250 | PF 1 | 601 | 3643.06 | 3646.16 | 3645.89 | 3646.54 | 0.010767 | 4.98 | 122.22 | 115.98 | 0.8 |
| 12 | 3000 | PF 1 | 601 | 3640.32 | 3642.87 | 3642.87 | 3643.39 | 0.01661 | 5.76 | 105.97 | 106.62 | 0.98 |
| 12 | 2891.053 | PF 1 | 601 | 3640 | 3641.54 | 3640.98 | 3641.68 | 0.00358 | 3.09 | 203.25 | 166.56 | 0.47 |
| 12 | 2770.872 | PF 1 | 651 | 3637.53 | 3640.69 | 3640.61 | 3640.98 | 0.010486 | 4.93 | 160.51 | 192.19 | 0.79 |
| 12 | 2500 | PF 1 | 651 | 3634.95 | 3636.98 | 3636.98 | 3637.45 | 0.018384 | 5.6 | 120.32 | 136.17 | 1.01 |
| 12 | 2250 | PF 1 | 651 | 3631.99 | 3632.79 | 3632.66 | 3632.99 | 0.008998 | 2.81 | 186.08 | 249.21 | 0.65 |
| 12 | 1951.087 | PF 1 | 651 | 3628.23 | 3628.96 | 3628.96 | 3629.32 | 0.017868 | 3.25 | 139.2 | 196.62 | 0.87 |
| 12 | 1750 | PF 1 | 651 | 3625.27 | 3626.01 | 3626.01 | 3626.01 | 0.000037 | 0.14 | 1316.36 | 608.51 | 0.04 |
| 12 | 1500 | PF 1 | 651 | 3620.11 | 3621.47 | 3622.39 | 3625.57 | 0.243728 | 16.25 | 40.06 | 58.62 | 3.46 |
| 12 | 1250 | PF 1 | 651 | 3617.24 | 3619.36 | 3619.01 | 3619.53 | 0.004733 | 3.58 | 207.14 | 201.16 | 0.54 |
| 12 | 1000 | PF 1 | 651 | 3615.73 | 3617.03 | 3617.03 | 3617.48 | 0.018023 | 5.72 | 123.42 | 141.09 | 1 |
| 12 | 750 | PF 1 | 651 | 3613.3 | 3614 | 3614 | 3614.01 | 0.000128 | 0.3 | 946.36 | 620.63 | 0.07 |
| 12 | 500 | PF 1 | 651 | 3610 | 3610.46 | 3610.93 | 3613.58 | 0.409921 | 13.38 | 46.08 | 123.54 | 4.01 |
| 12 | 250 | PF 1 | 651 | 3605.46 | 3607 | 3606.94 | 3607.3 | 0.014962 | 4.4 | 149.94 | 196.07 | 0.88 |
| 12 | 0 | PF 1 | 651 | 3600 | 3603.37 | 3603.37 | 3603.82 | 0.014505 | 5.76 | 123.61 | 120.53 | 0.92 |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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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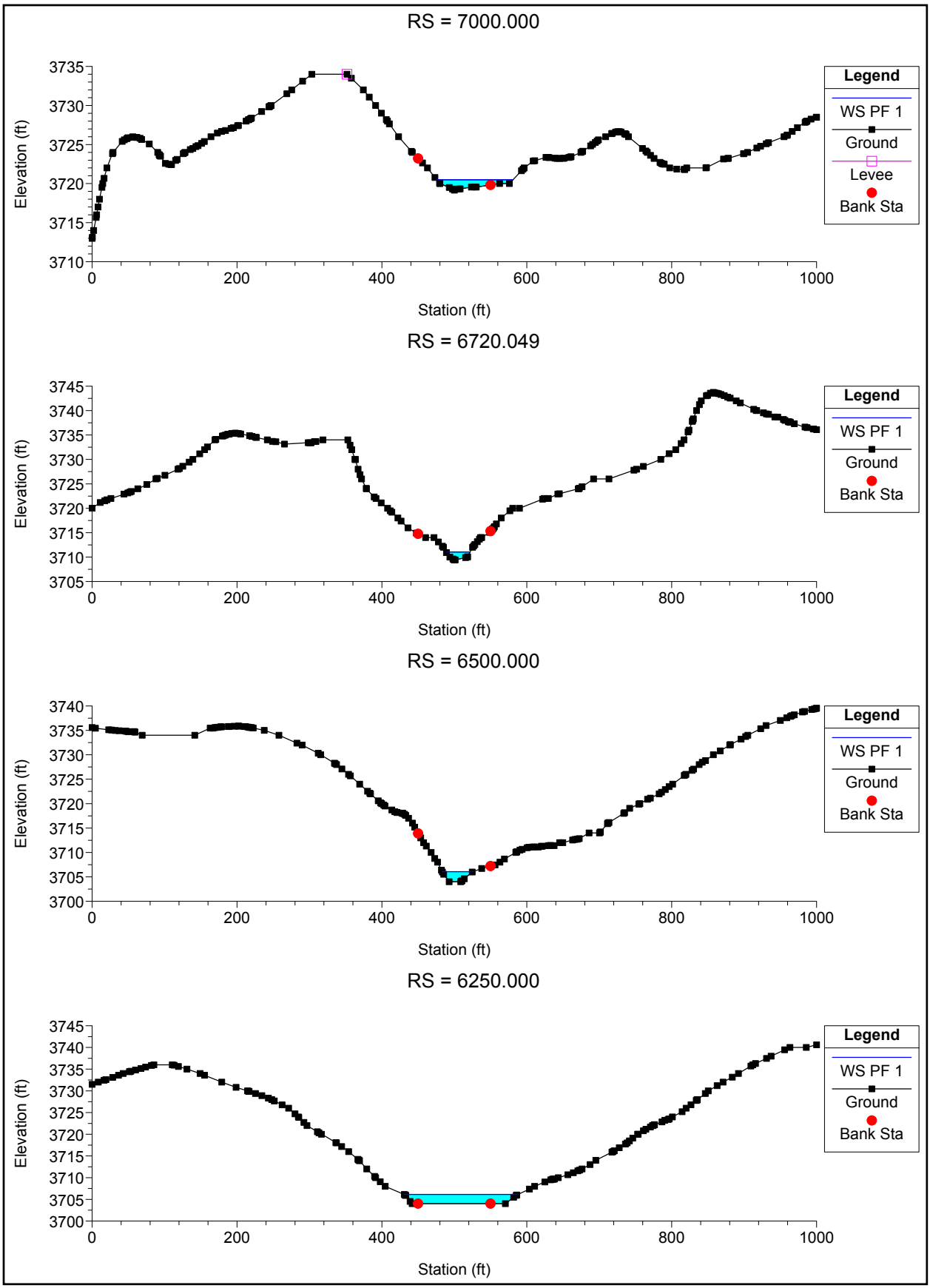
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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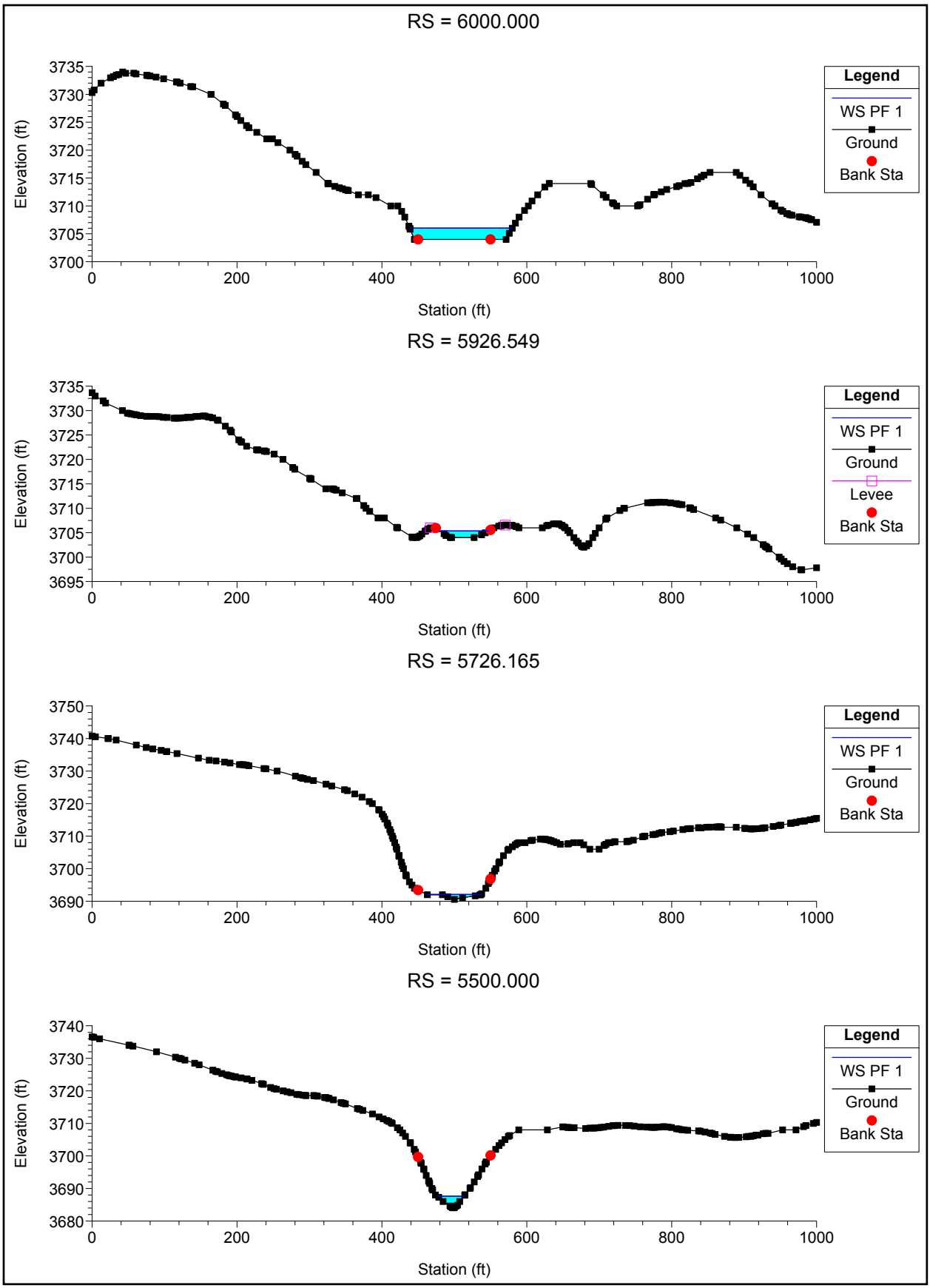
3730
3725
3720
3715
3710
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 6720.049
Elevation (ft)
3745
3740
3735
3730
3725
3720
3715
3710
3705
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6500.000
Elevation (ft)
3740
3735
3730
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6250.000
Elevation (ft)
3745
3740
3735
3730
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3710
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3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5926.549
Elevation (ft)
3735
3730
3725
3720
3715
3710
3705
3700
3695
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5726.165
Elevation (ft)
3750
3740
3730
3720
3710
3700
3690
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5500.000
Elevation (ft)
3740
3730
3720
3710
3700
3690
3680
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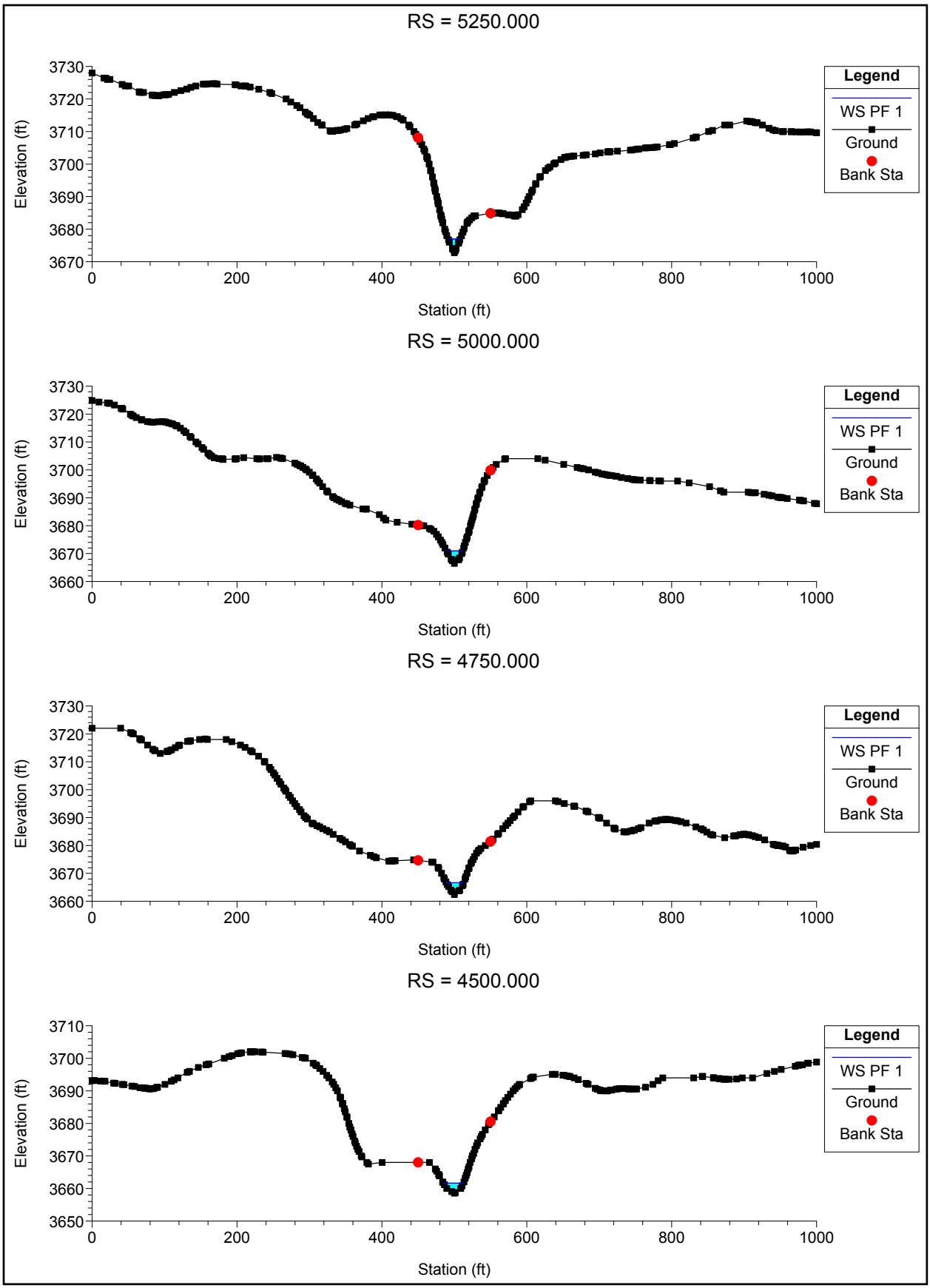
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3690
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
3730
3720
3710
3700
3690
3680
3670
3660
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4750.000
Elevation (ft)
3730
3720
3710
3700
3690
3680
3670
3660
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4500.000
Elevation (ft)
3710
3700
3690
3680
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3660
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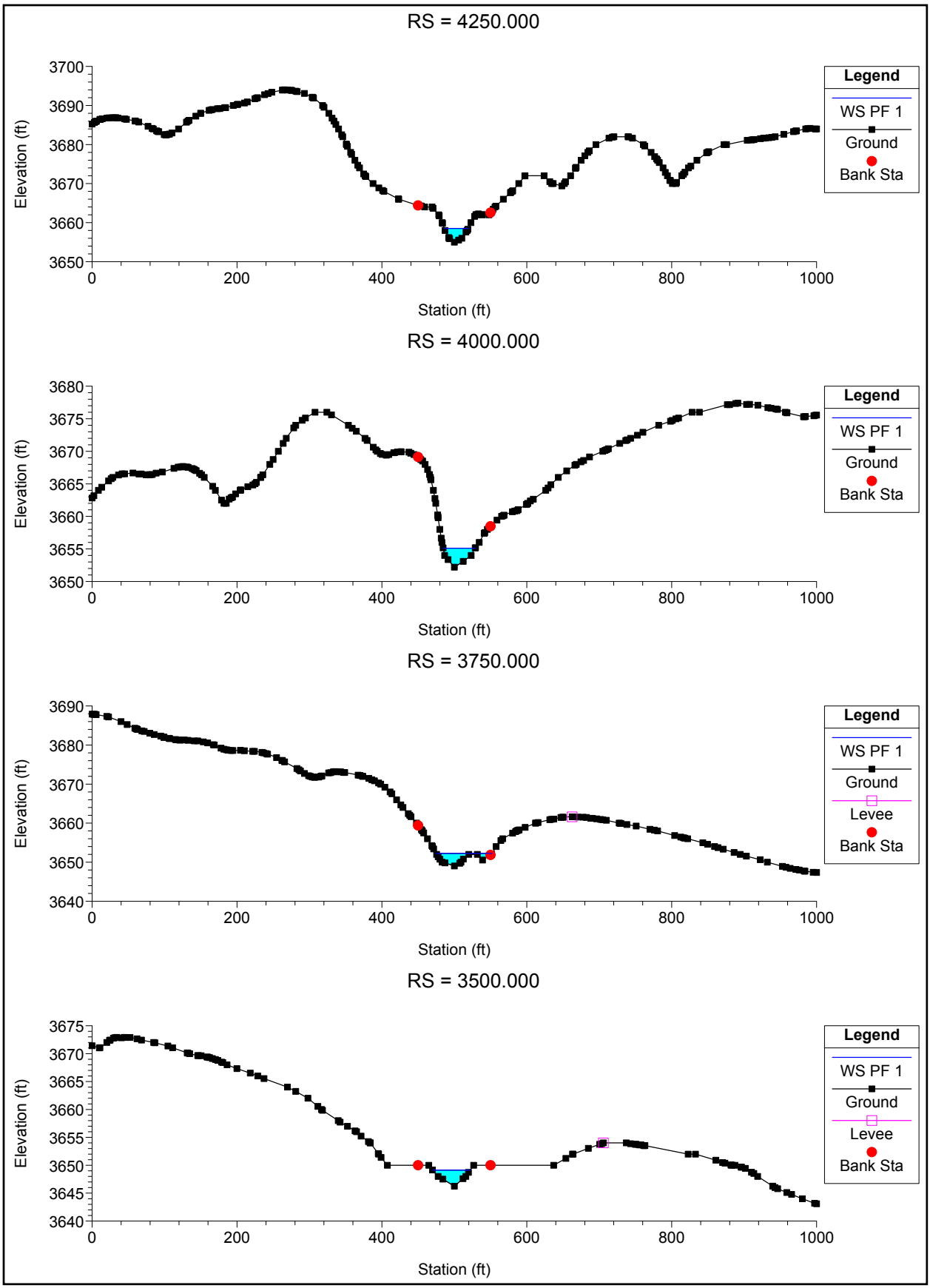
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
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200
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4000.000
Elevation (ft)
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3675
3670
3665
3660
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3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
3690
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3670
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3640
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200
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600
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1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3500.000
Elevation (ft)
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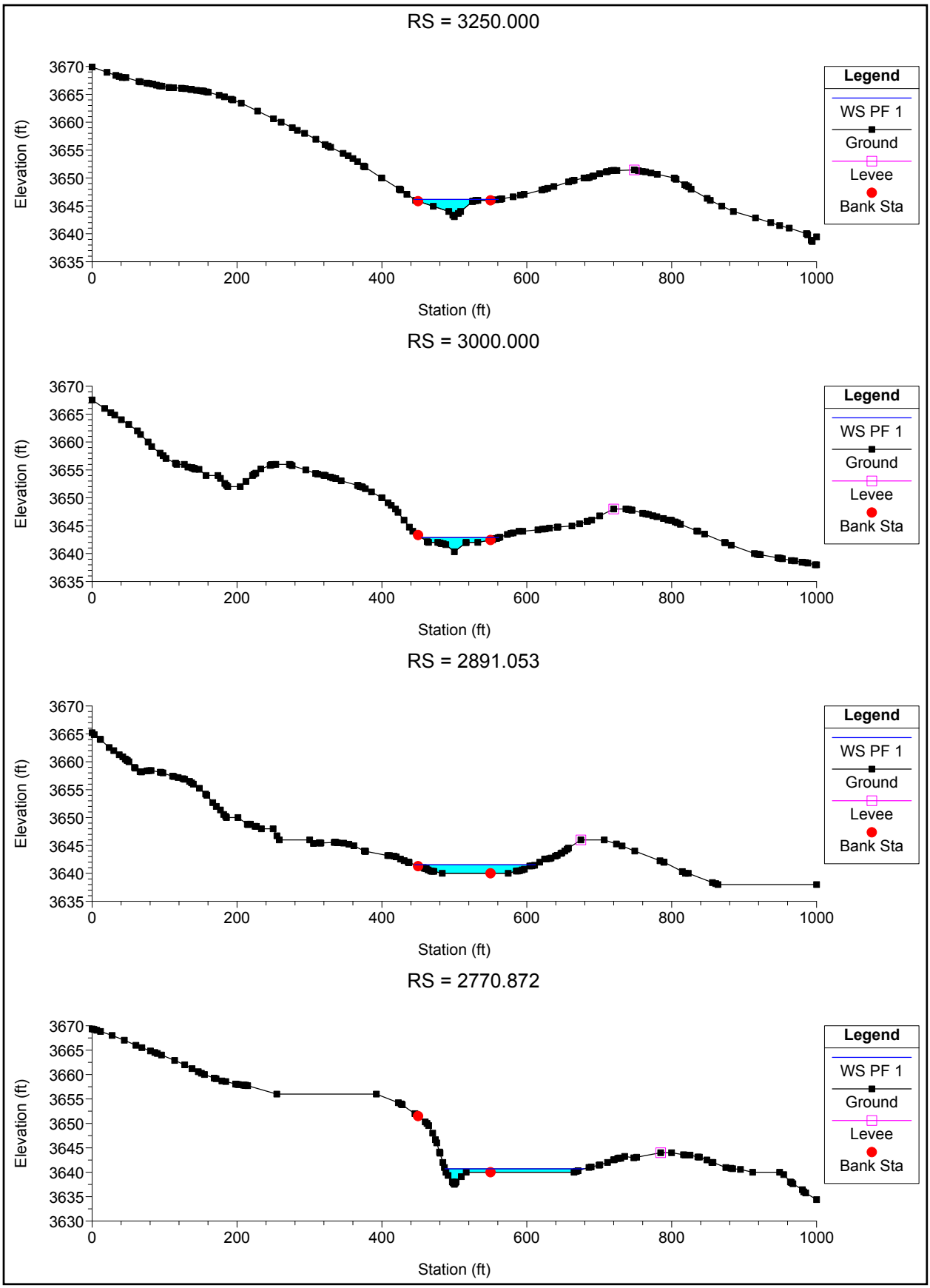
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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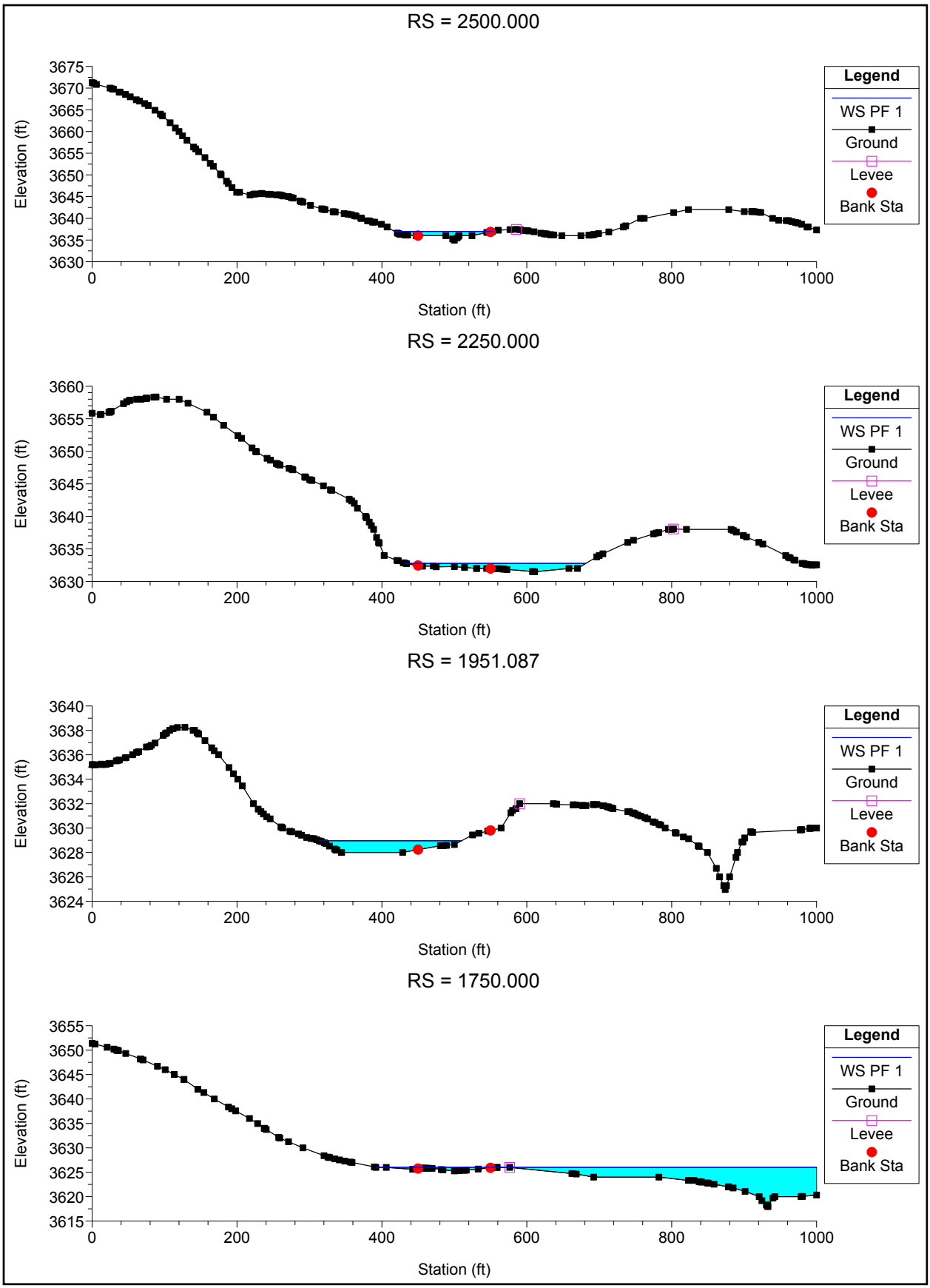
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3000.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2891.053
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2770.872
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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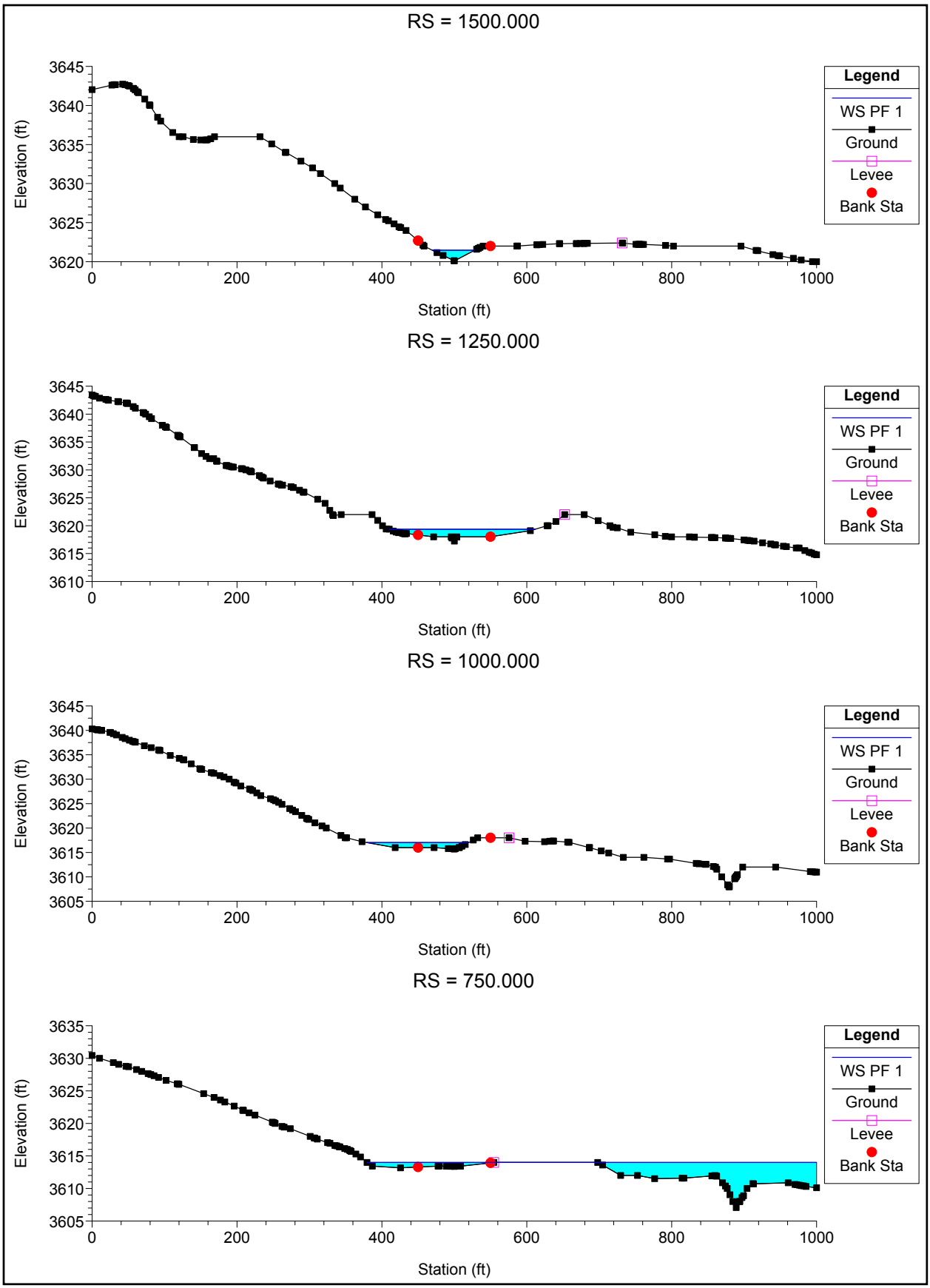
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1951.087
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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3640
3635
3630
3625
3620
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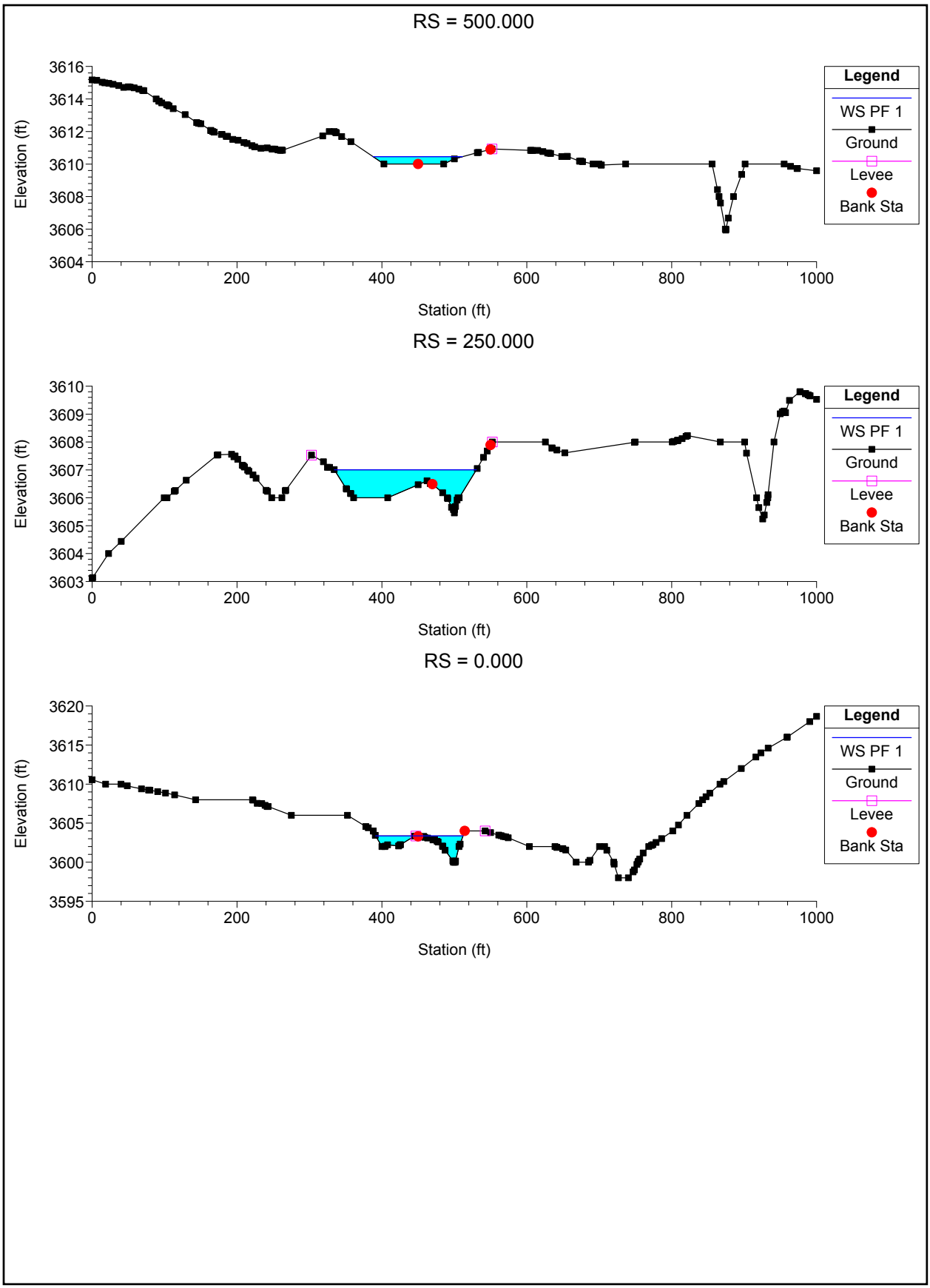
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1250.000
Elevation (ft)
3645
3640
3635
3630
3625
3620
3615
3610
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1000.000
Elevation (ft)
3645
3640
3635
3630
3625
3620
3615
3610
3605
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3635
3630
3625
3620
3615
3610
3605
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 500.000
Elevation (ft)
3616
3614
3612
3610
3608
3606
3604
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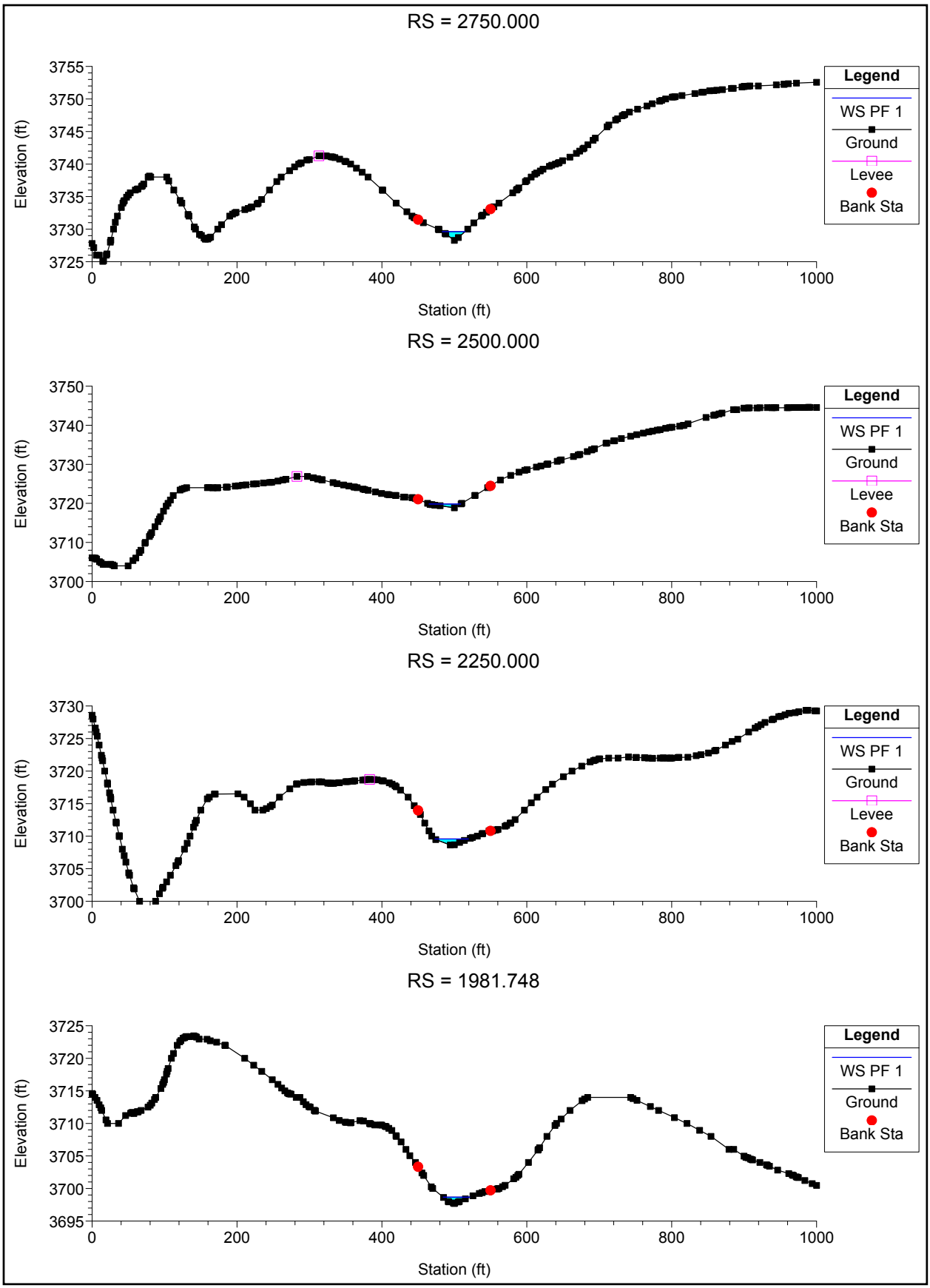
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 250.000
Elevation (ft)
3610
3609
3608
3607
3606
3605
3604
3603
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 0.000
Elevation (ft)
3620
3615
3610
3605
3600
3595
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-24

# HEC-RAS Channel 13

| 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) | |
| 13 | 2750 | PF 1 | 126 | 3728.28 | 3729.62 | 3729.76 | 3730.17 | 0.033005 | 5.93 | 21.24 | 31.39 | 1.27 |
| 13 | 2500 | PF 1 | 126 | 3718.87 | 3719.82 | 3719.97 | 3720.35 | 0.048909 | 5.85 | 21.55 | 43.78 | 1.47 |
| 13 | 2250 | PF 1 | 126 | 3708.64 | 3709.58 | 3709.69 | 3710.01 | 0.037366 | 5.28 | 23.86 | 46.2 | 1.29 |
| 13 | 1981.748 | PF 1 | 126 | 3697.7 | 3698.68 | 3698.87 | 3699.31 | 0.050598 | 6.33 | 19.9 | 36.79 | 1.52 |
| 13 | 1813.107 | PF 1 | 126 | 3690.65 | 3692.29 | 3692.42 | 3692.88 | 0.02992 | 6.17 | 20.42 | 26.31 | 1.23 |
| 13 | 1678.02 | PF 1 | 126 | 3685.6 | 3687.06 | 3687.29 | 3687.78 | 0.049553 | 6.83 | 18.44 | 29.81 | 1.53 |
| 13 | 1500 | PF 1 | 126 | 3681.7 | 3683.12 | 3683.12 | 3683.5 | 0.020603 | 4.9 | 25.71 | 35.51 | 1.01 |
| 13 | 1250 | PF 1 | 126 | 3675.16 | 3676.35 | 3676.51 | 3676.97 | 0.039212 | 6.31 | 19.96 | 30.55 | 1.38 |
| 13 | 1000 | PF 1 | 126 | 3670.89 | 3672.36 | 3672.36 | 3672.77 | 0.019738 | 5.19 | 24.28 | 29.73 | 1.01 |
| 13 | 750 | PF 1 | 126 | 3662.6 | 3664.62 | 3665.02 | 3665.89 | 0.049274 | 9.04 | 13.94 | 14.26 | 1.61 |
| 13 | 644.959 | PF 1 | 126 | 3660.93 | 3663.48 | 3663.33 | 3663.94 | 0.013051 | 5.43 | 23.21 | 18.92 | 0.86 |
| 13 | 500 | PF 1 | 126 | 3659.32 | 3661.25 | 3661.25 | 3661.66 | 0.020521 | 5.14 | 24.52 | 31.21 | 1.02 |
| 13 | 250 | PF 1 | 126 | 3655.02 | 3657.2 | 3657.34 | 3657.93 | 0.025987 | 6.85 | 18.39 | 17.71 | 1.19 |
| 13 | 0 | PF 1 | 126 | 3652 | 3654.41 | 3654.15 | 3654.75 | 0.010008 | 4.62 | 27.27 | 23.51 | 0.76 |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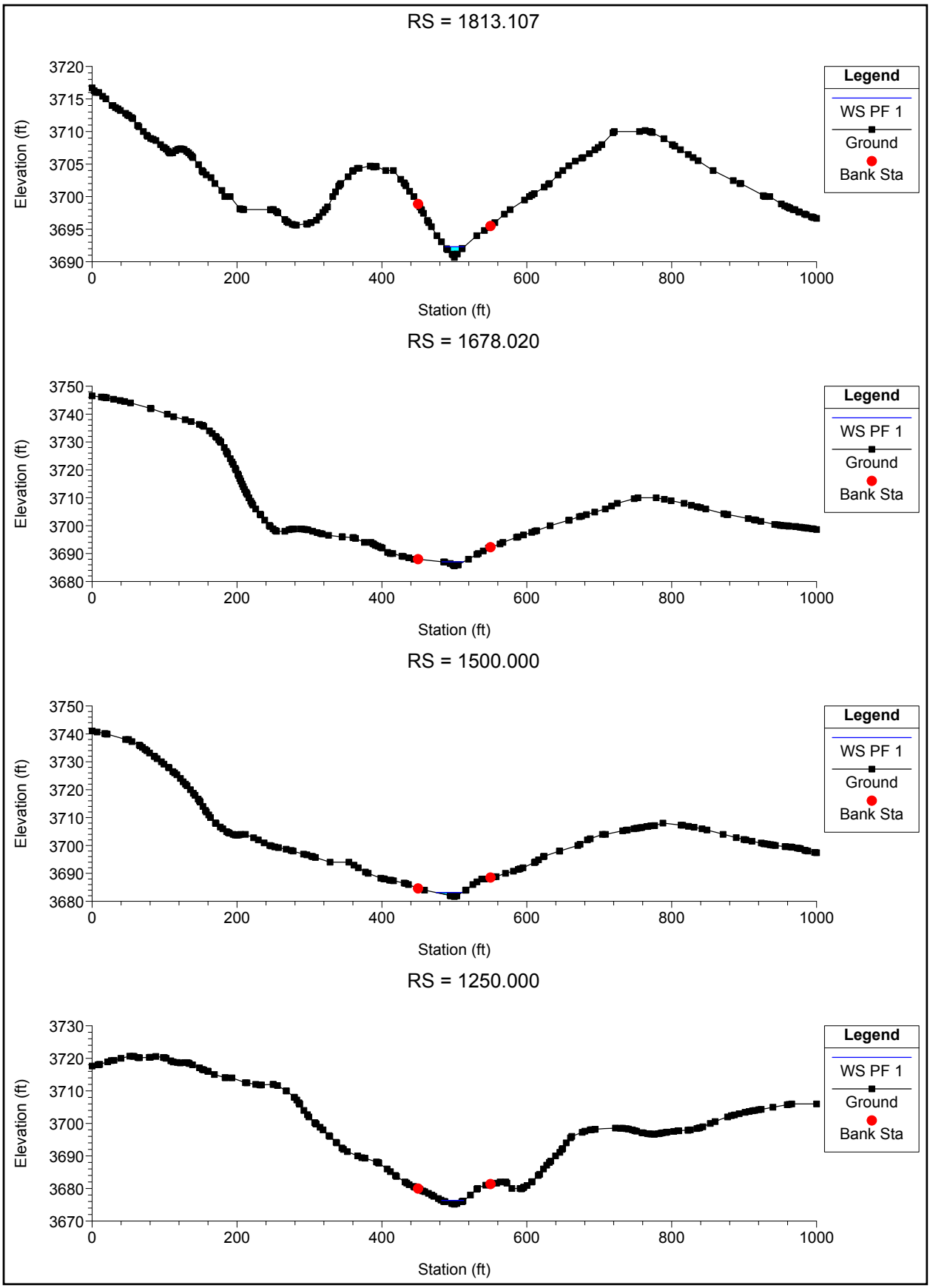
3750
3745
3740
3735
3730
3725
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2500.000
Elevation (ft)
3750
3740
3730
3720
3710
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2250.000
Elevation (ft)
3730
3725
3720
3715
3710
3705
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1981.748
Elevation (ft)
3725
3720
3715
3710
3705
3700
3695
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 1813.107
Elevation (ft)
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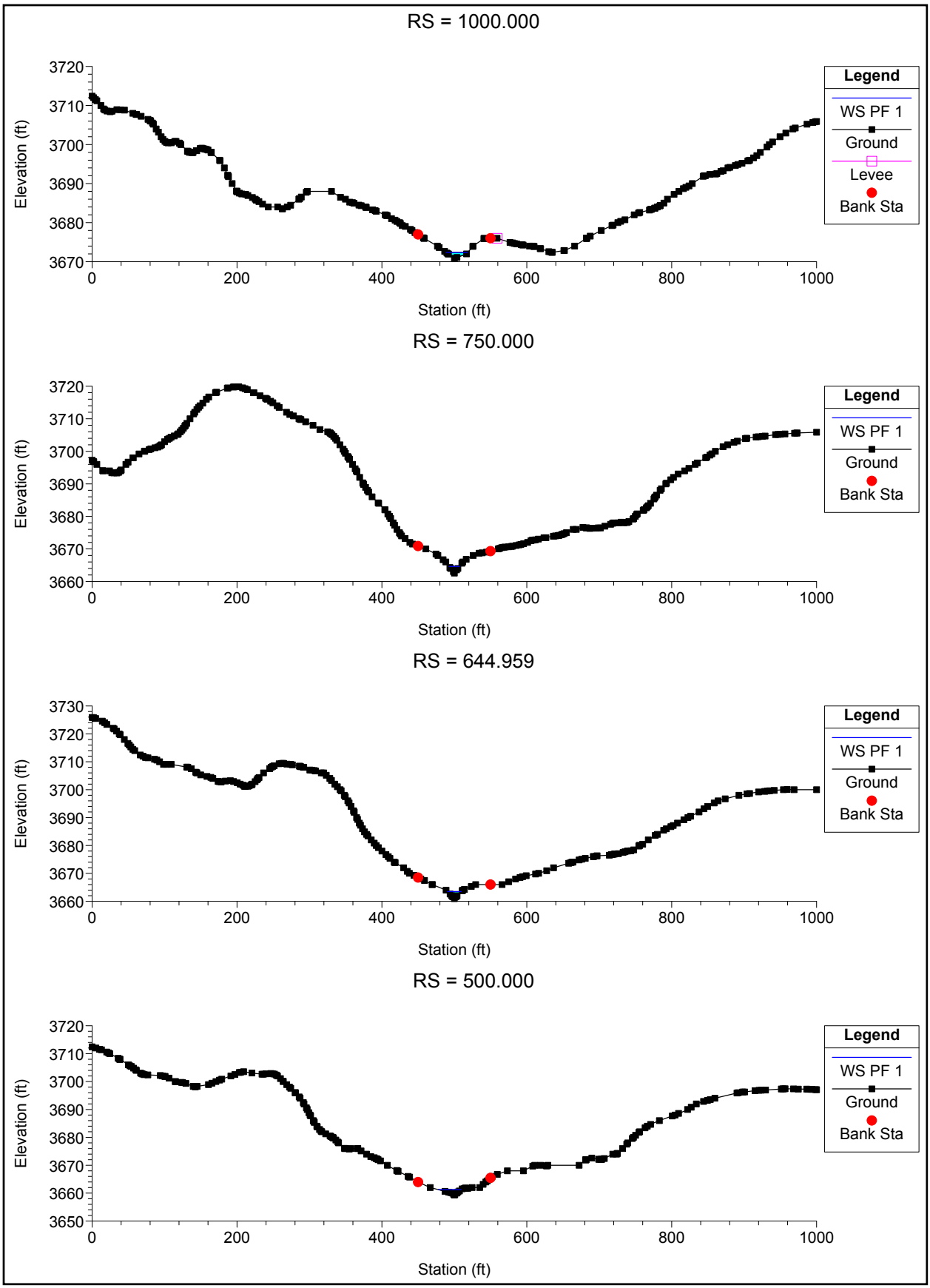
3715
3710
3705
3700
3695
3690
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1678.020
Elevation (ft)
3750
3740
3730
3720
3710
3700
3690
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
3750
3740
3730
3720
3710
3700
3690
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
3730
3720
3710
3700
3690
3680
3670
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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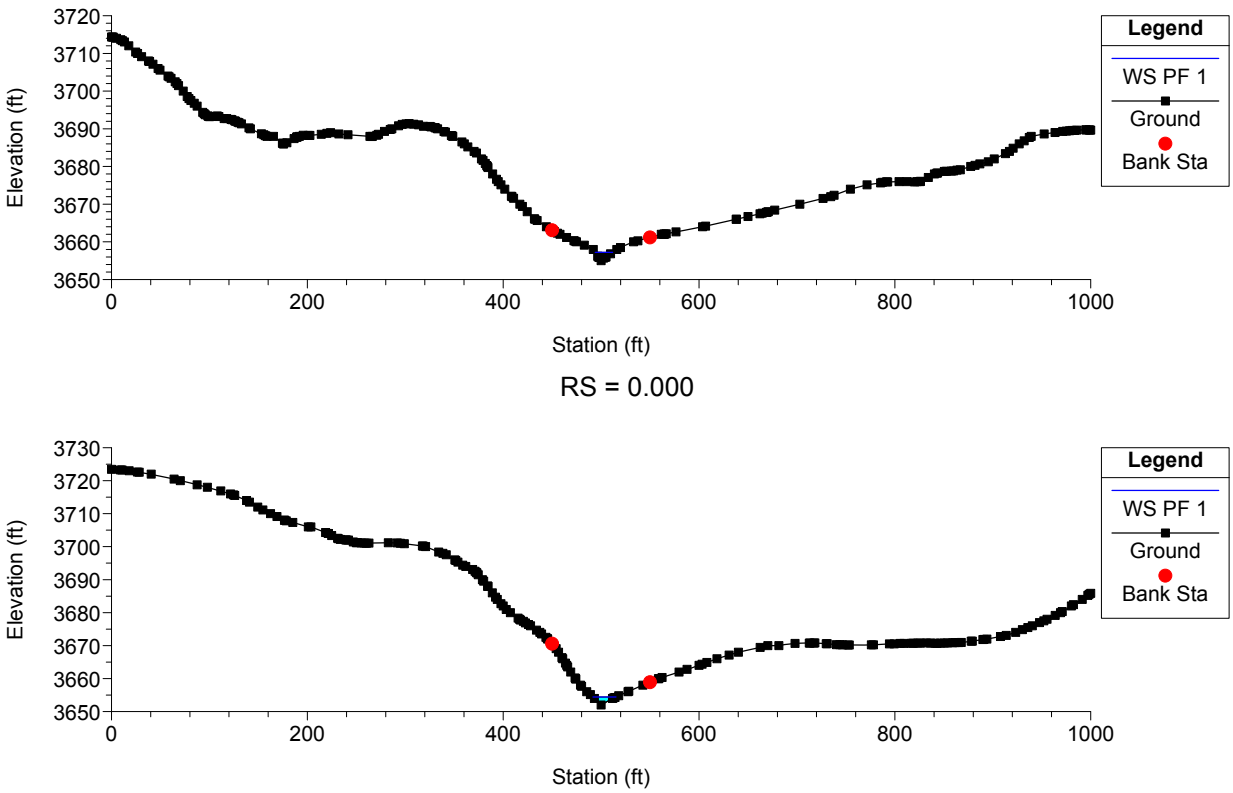
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 644.959
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

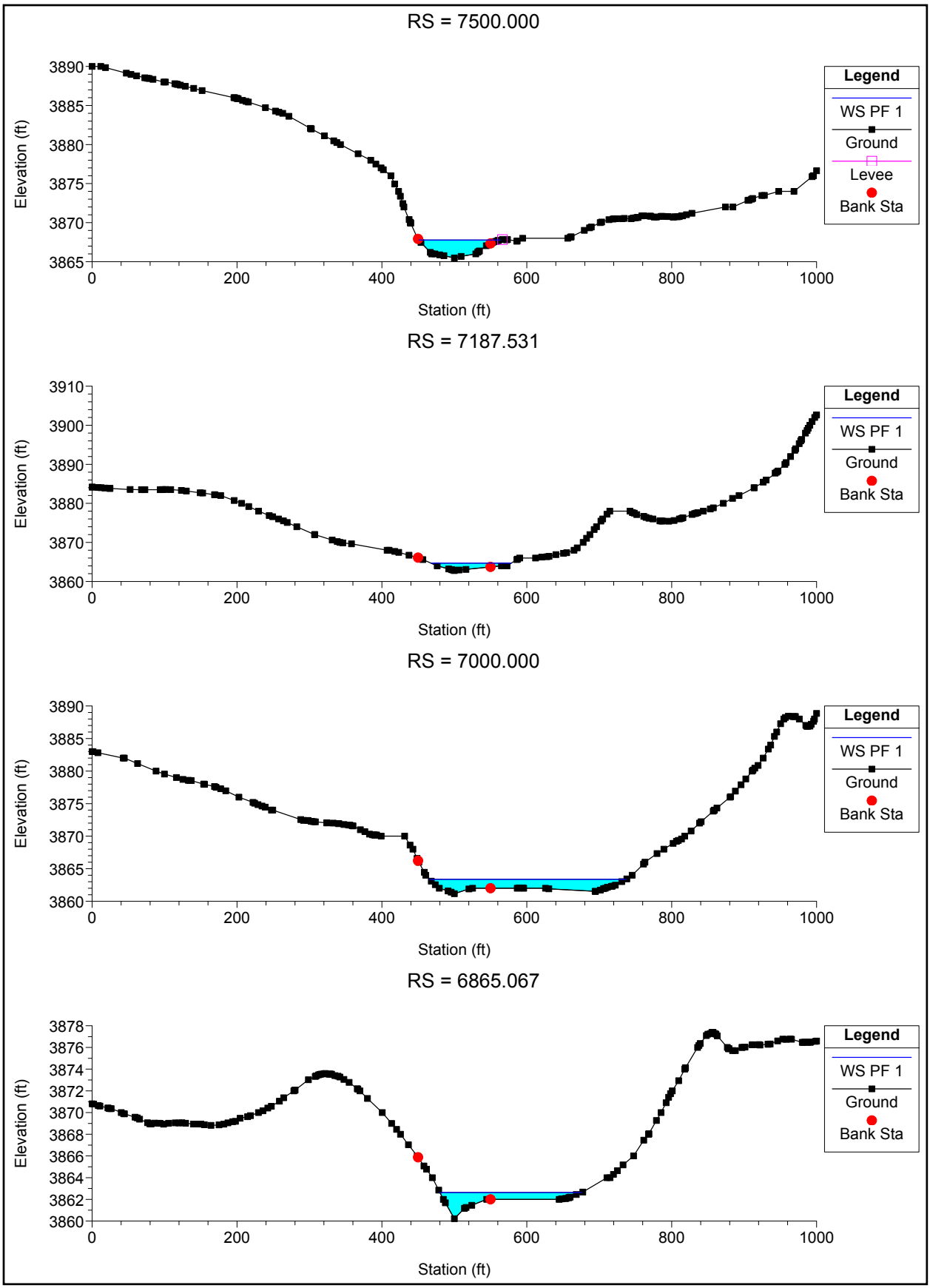

RS = 250.000
Elevation (ft)
3720
3710
3700
3690
3680
3670
3660
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 0.000
Elevation (ft)
3730
3720
3710
3700
3690
3680
3670
3660
3650
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-25

# HEC-RAS Channel 14

| 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) | |
| 14 | 7500 | PF 1 | 730 | 3865.49 | 3867.77 | 3867.33 | 3868.09 | 0.006234 | 4.59 | 160.82 | 111.96 | 0.64 |
| 14 | 7187.531 | PF 1 | 730 | 3862.78 | 3864.69 | 3864.69 | 3865.25 | 0.015655 | 6.22 | 123.86 | 110.57 | 0.97 |
| 14 | 7000 | PF 1 | 730 | 3861.17 | 3863.36 | 3862.52 | 3863.42 | 0.001273 | 1.95 | 382.78 | 270.93 | 0.28 |
| 14 | 6865.067 | PF 1 | 730 | 3860.22 | 3862.63 | 3862.63 | 3863.02 | 0.013369 | 5.65 | 158.01 | 195.65 | 0.89 |
| 14 | 6648.852 | PF 1 | 730 | 3856.93 | 3858.38 | 3858.55 | 3859.08 | 0.027492 | 7.03 | 111.19 | 127.78 | 1.24 |
| 14 | 6500 | PF 1 | 730 | 3853.94 | 3855.39 | 3855.42 | 3856.02 | 0.01794 | 6.55 | 115.04 | 98.15 | 1.04 |
| 14 | 6250 | PF 1 | 730 | 3850.09 | 3852.3 | 3852.3 | 3852.36 | 0.001214 | 1.77 | 375.66 | 250.62 | 0.27 |
| 14 | 5944.515 | PF 1 | 730 | 3843.49 | 3845.61 | 3846.72 | 3850.92 | 0.192711 | 18.49 | 39.49 | 39.68 | 3.27 |
| 14 | 5750 | PF 1 | 730 | 3840.62 | 3844.35 | 3844.35 | 3845.09 | 0.015912 | 6.9 | 105.92 | 73.89 | 1 |
| 14 | 5500 | PF 1 | 730 | 3837.8 | 3841 | 3840.21 | 3841.23 | 0.003193 | 4 | 192.48 | 100.58 | 0.48 |
| 14 | 5250 | PF 1 | 730 | 3835.79 | 3839.28 | 3839.08 | 3840.06 | 0.011159 | 7.09 | 102.9 | 51.16 | 0.88 |
| 14 | 5082.985 | PF 1 | 730 | 3834.06 | 3837.13 | 3837.12 | 3837.96 | 0.015318 | 7.3 | 100.02 | 60.77 | 1 |
| 14 | 4939.007 | PF 1 | 730 | 3833 | 3836.04 | | 3836.46 | 0.006825 | 5.22 | 139.78 | 76.62 | 0.68 |
| 14 | 4750 | PF 1 | 730 | 3831.44 | 3834.23 | 3834.09 | 3834.88 | 0.012111 | 6.48 | 112.7 | 68.74 | 0.89 |
| 14 | 4500 | PF 1 | 730 | 3828.74 | 3831.92 | 3831.5 | 3832.46 | 0.007851 | 5.93 | 123.15 | 61.83 | 0.74 |
| 14 | 4250 | PF 1 | 730 | 3825.16 | 3828.89 | 3828.89 | 3829.82 | 0.014646 | 7.76 | 94.02 | 50.02 | 1 |
| 14 | 4000 | PF 1 | 730 | 3820.65 | 3823.72 | 3824.16 | 3825.2 | 0.025324 | 9.78 | 74.66 | 42.35 | 1.3 |
| 14 | 3750 | PF 1 | 730 | 3817.52 | 3821.77 | 3821.4 | 3822.37 | 0.009102 | 6.25 | 116.78 | 60.15 | 0.79 |
| 14 | 3500 | PF 1 | 730 | 3814.57 | 3818.87 | 3818.87 | 3819.9 | 0.014115 | 8.16 | 89.41 | 42.41 | 0.99 |
| 14 | 3250 | PF 1 | 730 | 3809.36 | 3812.92 | 3813.58 | 3815.08 | 0.031349 | 11.78 | 61.96 | 30.69 | 1.46 |
| 14 | 3000 | PF 1 | 2032 | 3804 | 3811.34 | 3811.08 | 3812.79 | 0.010023 | 9.64 | 210.75 | 59.58 | 0.9 |
| 14 | 2750 | PF 1 | 2032 | 3802.2 | 3808.99 | 3808.73 | 3810.25 | 0.010107 | 9.01 | 225.61 | 72.26 | 0.9 |
| 14 | 2500 | PF 1 | 2032 | 3800.13 | 3807.35 | | 3808.19 | 0.006148 | 7.37 | 275.79 | 82.39 | 0.71 |
| 14 | 2250 | PF 1 | 2032 | 3798.06 | 3805.2 | | 3806.37 | 0.008627 | 8.65 | 234.92 | 70.66 | 0.84 |
| 14 | 2000 | PF 1 | 2032 | 3795.83 | 3803.53 | | 3804.35 | 0.006866 | 7.29 | 282.09 | 103.37 | 0.74 |
| 14 | 1750 | PF 1 | 2032 | 3794.66 | 3802.24 | | 3802.86 | 0.004827 | 6.35 | 320.64 | 104.3 | 0.63 |
| 14 | 1500 | PF 1 | 2032 | 3793.45 | 3799.71 | 3799.67 | 3801.07 | 0.011662 | 9.36 | 219.58 | 83.7 | 0.96 |
| 14 | 1250 | PF 1 | 2032 | 3791.77 | 3797.59 | 3797.35 | 3798.61 | 0.008151 | 8.33 | 265.52 | 111.3 | 0.81 |
| 14 | 1125.154 | PF 1 | 2032 | 3790.2 | 3796.39 | 3796.25 | 3797.49 | 0.010894 | 8.44 | 243.15 | 100.28 | 0.91 |
| 14 | 1000 | PF 1 | 2032 | 3789.44 | 3794.93 | 3794.93 | 3796.03 | 0.012457 | 8.44 | 245.97 | 129.65 | 0.96 |
| 14 | 750 | PF 1 | 2032 | 3787.73 | 3792.54 | 3792.34 | 3793.35 | 0.008065 | 7.93 | 304.99 | 149.53 | 0.8 |
| 14 | 500 | PF 1 | 2032 | 3785.6 | 3791.34 | | 3791.93 | 0.005113 | 6.7 | 348.7 | 143.98 | 0.65 |
| 14 | 250 | PF 1 | 2032 | 3784.13 | 3789.15 | 3789.06 | 3790.4 | 0.010771 | 9.09 | 231.91 | 91.25 | 0.93 |
| 14 | 0 | PF 1 | 2032 | 3782 | 3787.13 | 3786.66 | 3788.04 | 0.00801 | 7.66 | 265.15 | 91.93 | 0.8 |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3885
3880
3875
3870
3865
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7187.531
Elevation (ft)
3910
3900
3890
3880
3870
3860
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7000.000
Elevation (ft)
3890
3885
3880
3875
3870
3865
3860
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6865.067
Elevation (ft)
3878
3876
3874
3872
3870
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3866
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3862
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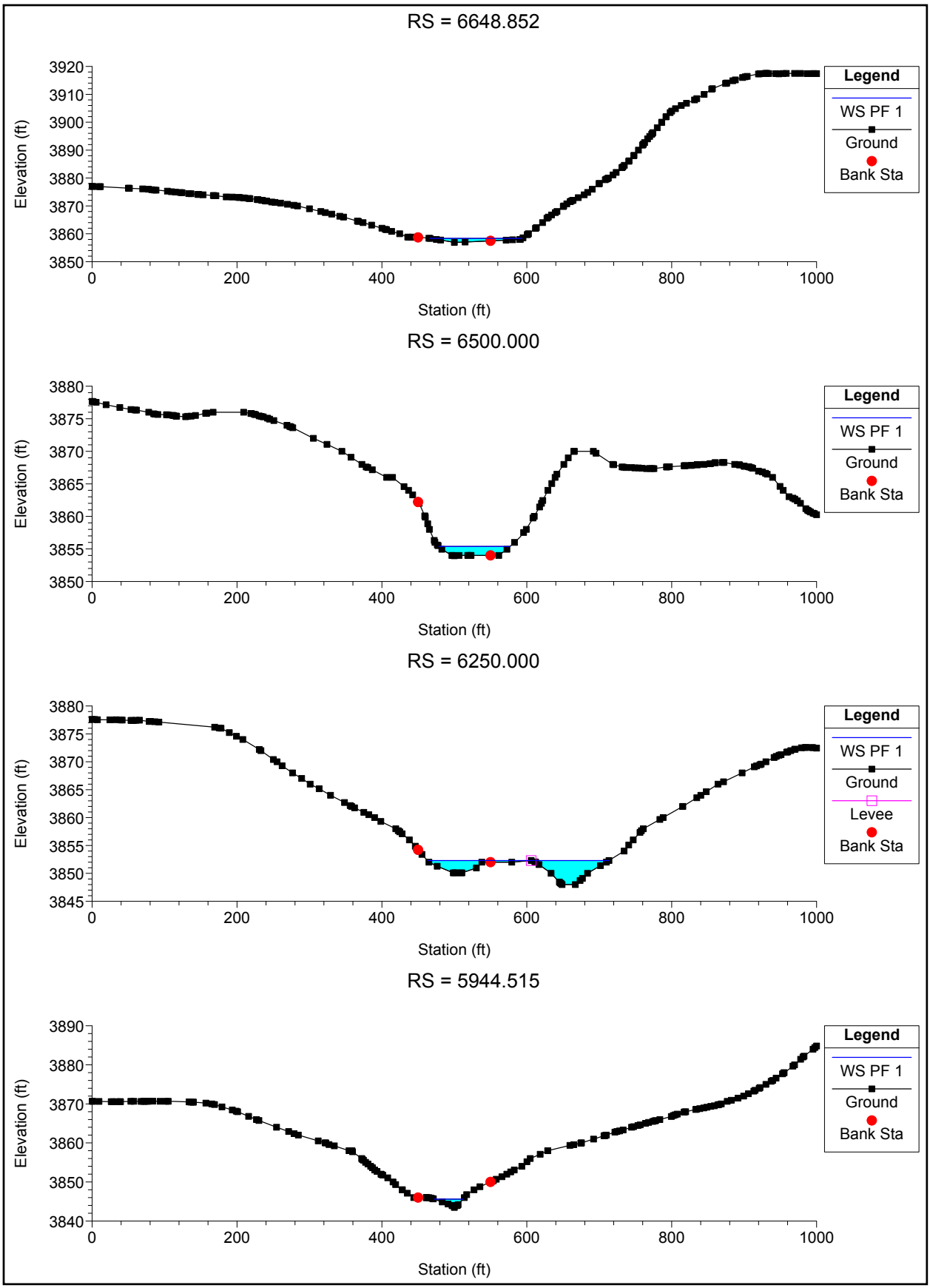
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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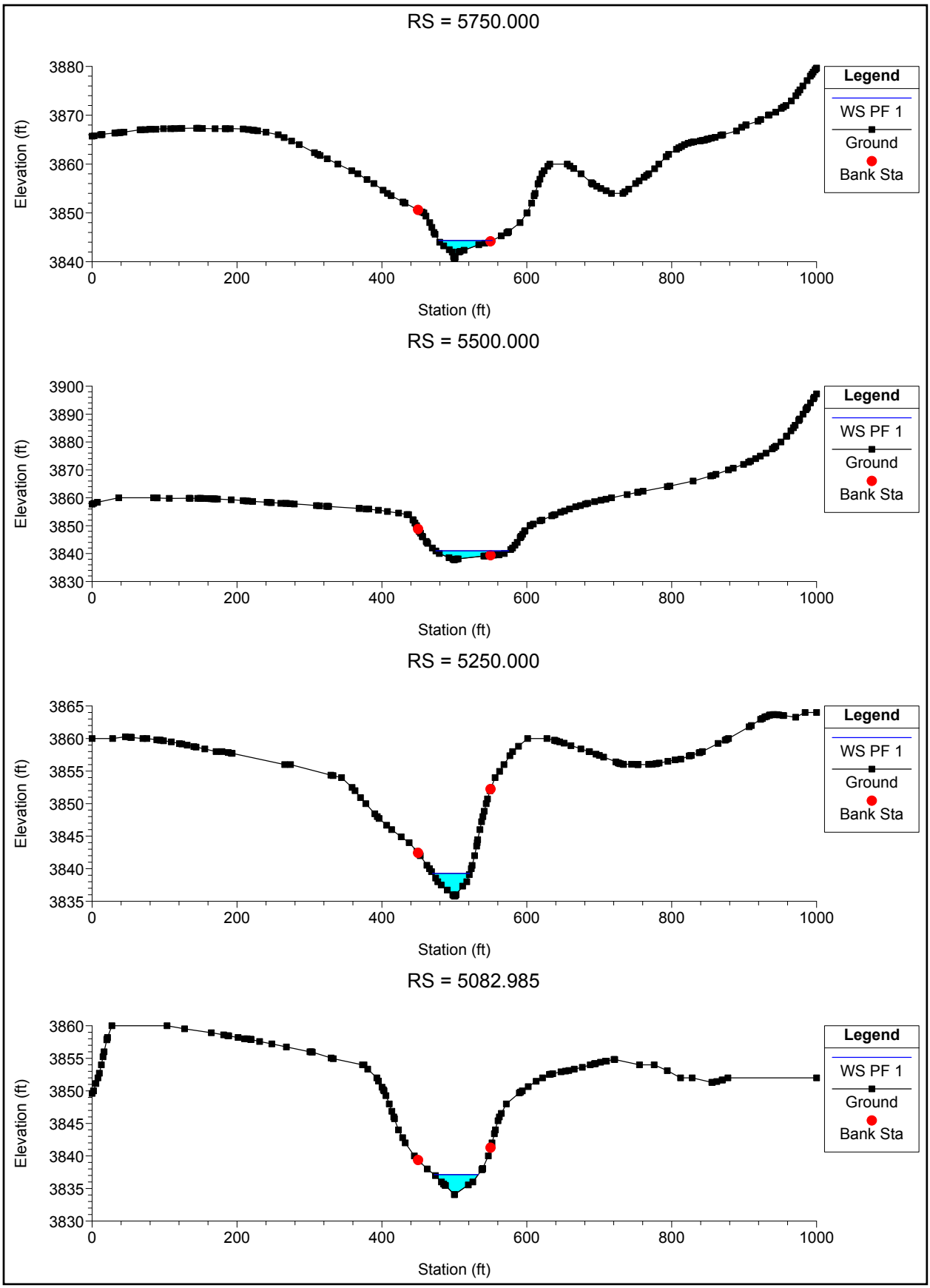
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5944.515
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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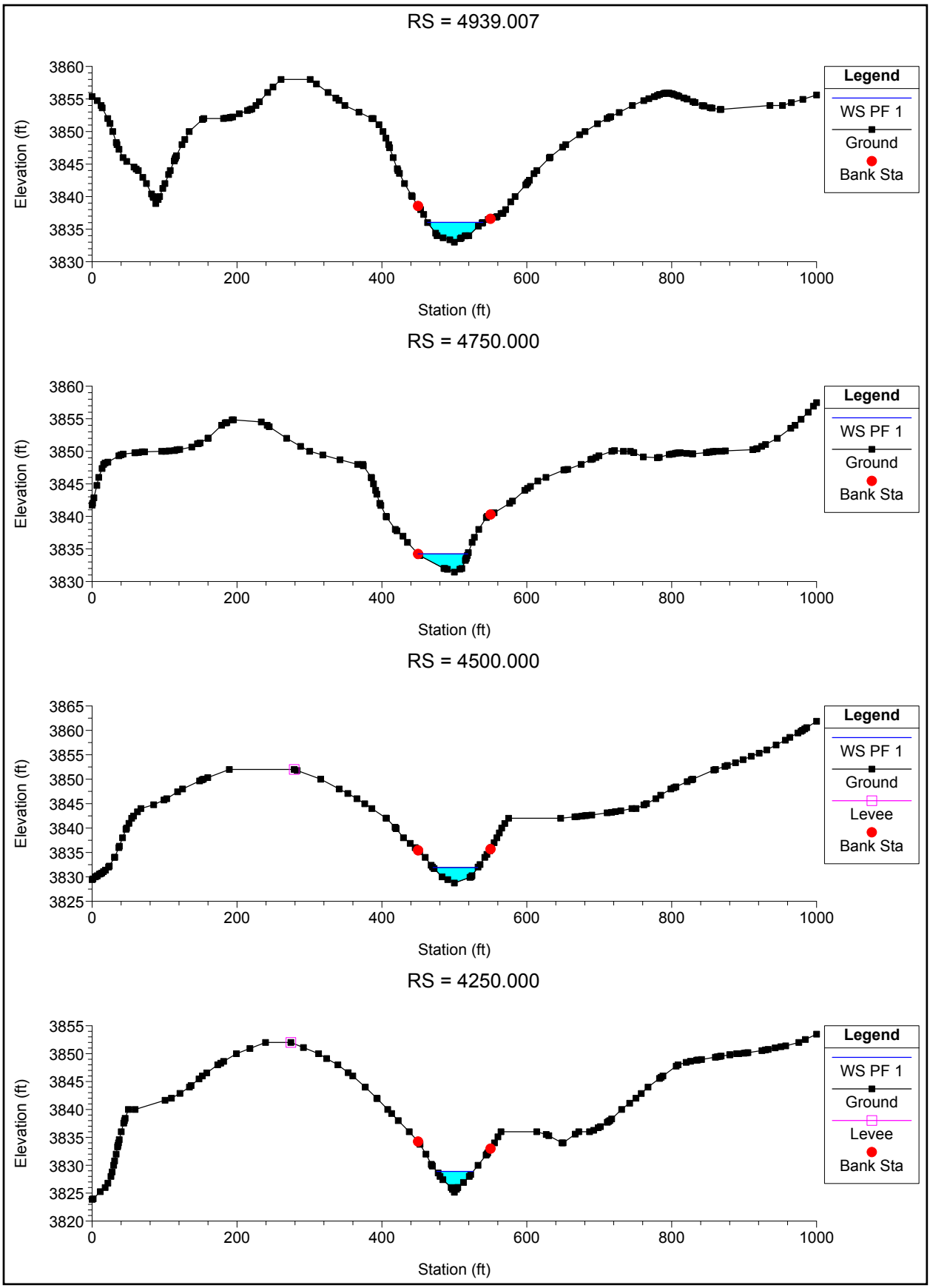
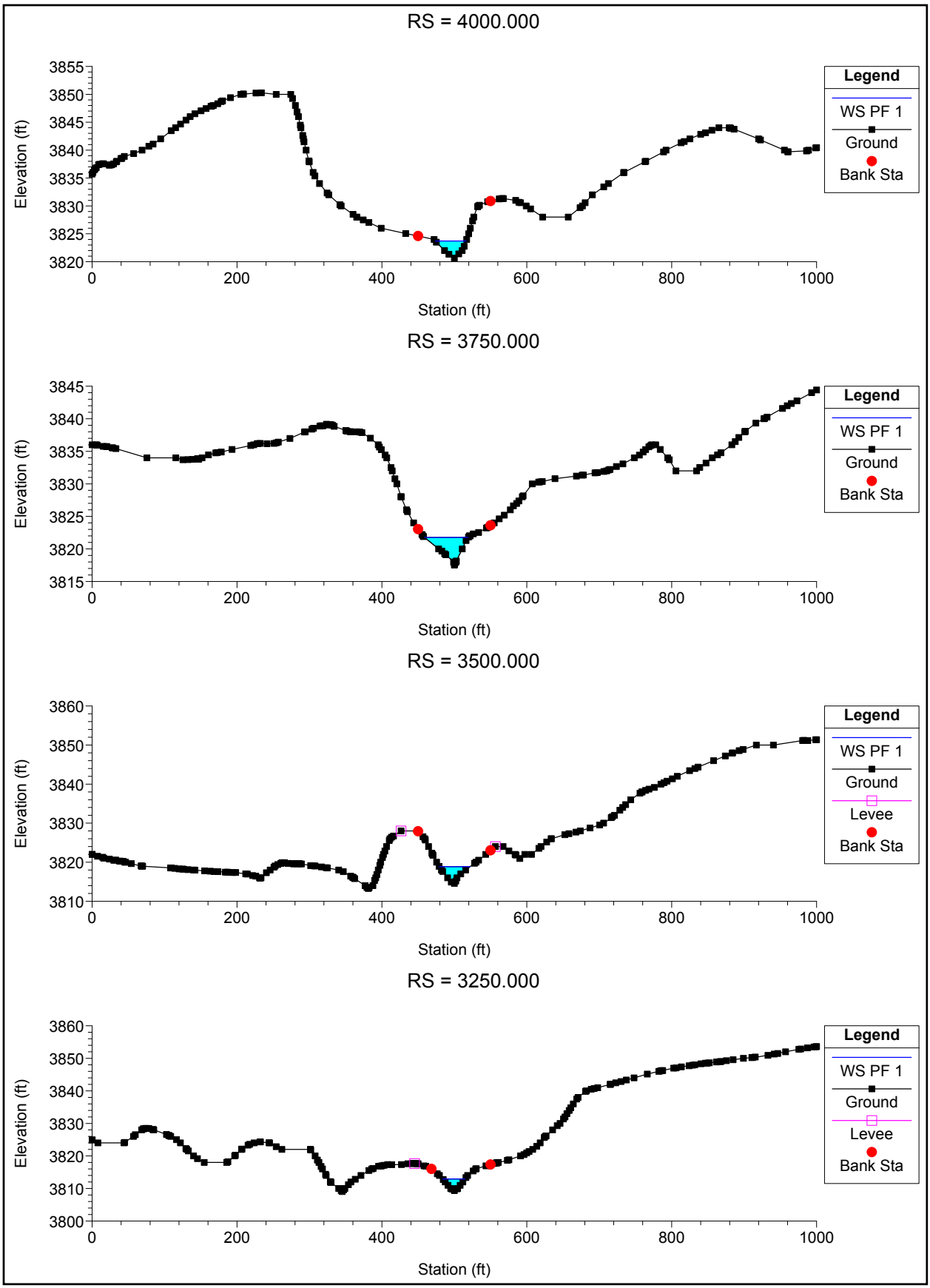
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5500.000
Elevation (ft)
3900
3890
3880
3870
3860
3850
3840
3830
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5250.000
Elevation (ft)
3865
3860
3855
3850
3845
3840
3835
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5082.985
Elevation (ft)
3860
3855
3850
3845
3840
3835
3830
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 4939.007
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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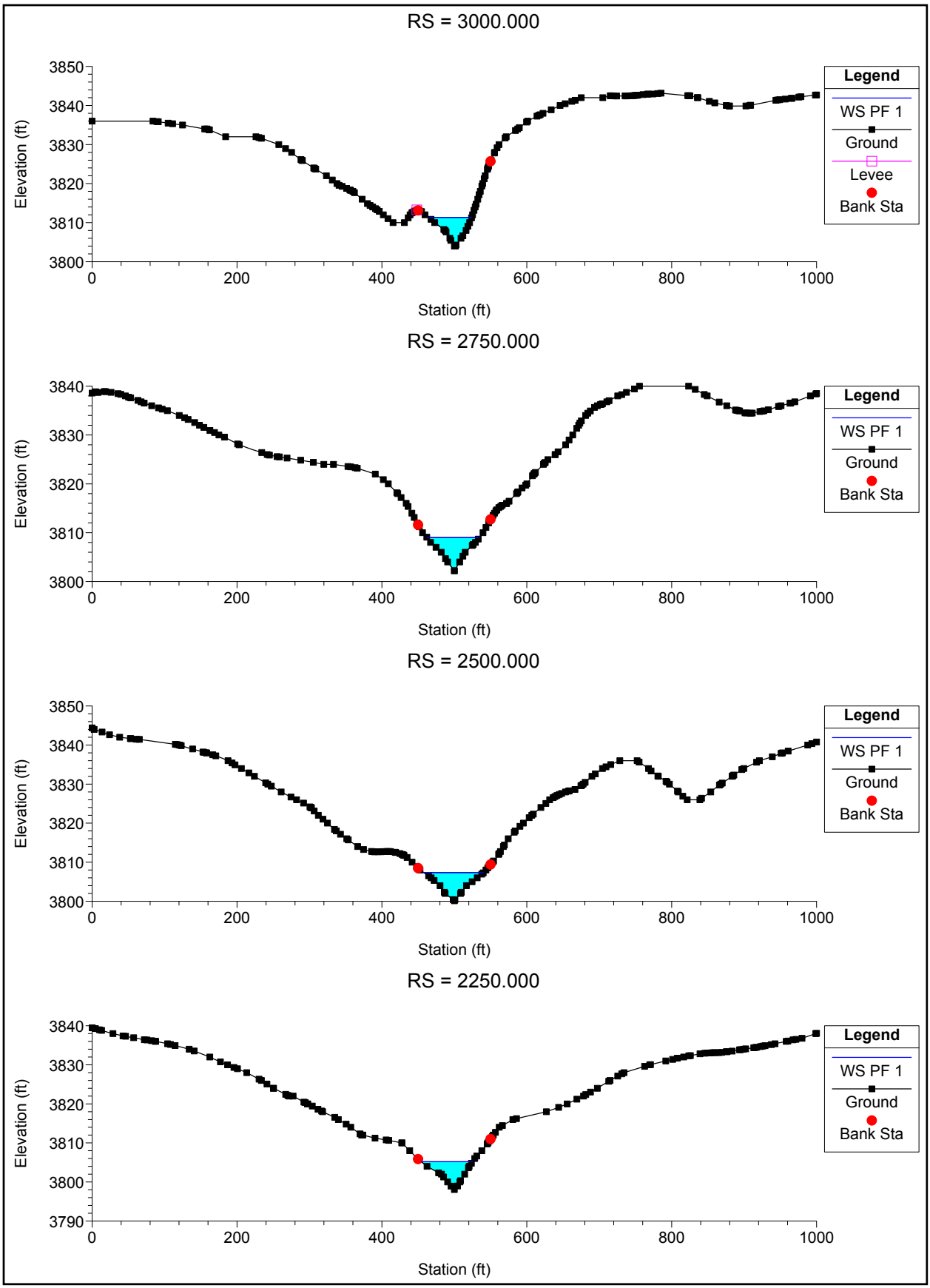
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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600
800
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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2750.000
Elevation (ft)
3840
3830
3820
3810
3800
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2500.000
Elevation (ft)
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3840
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3800
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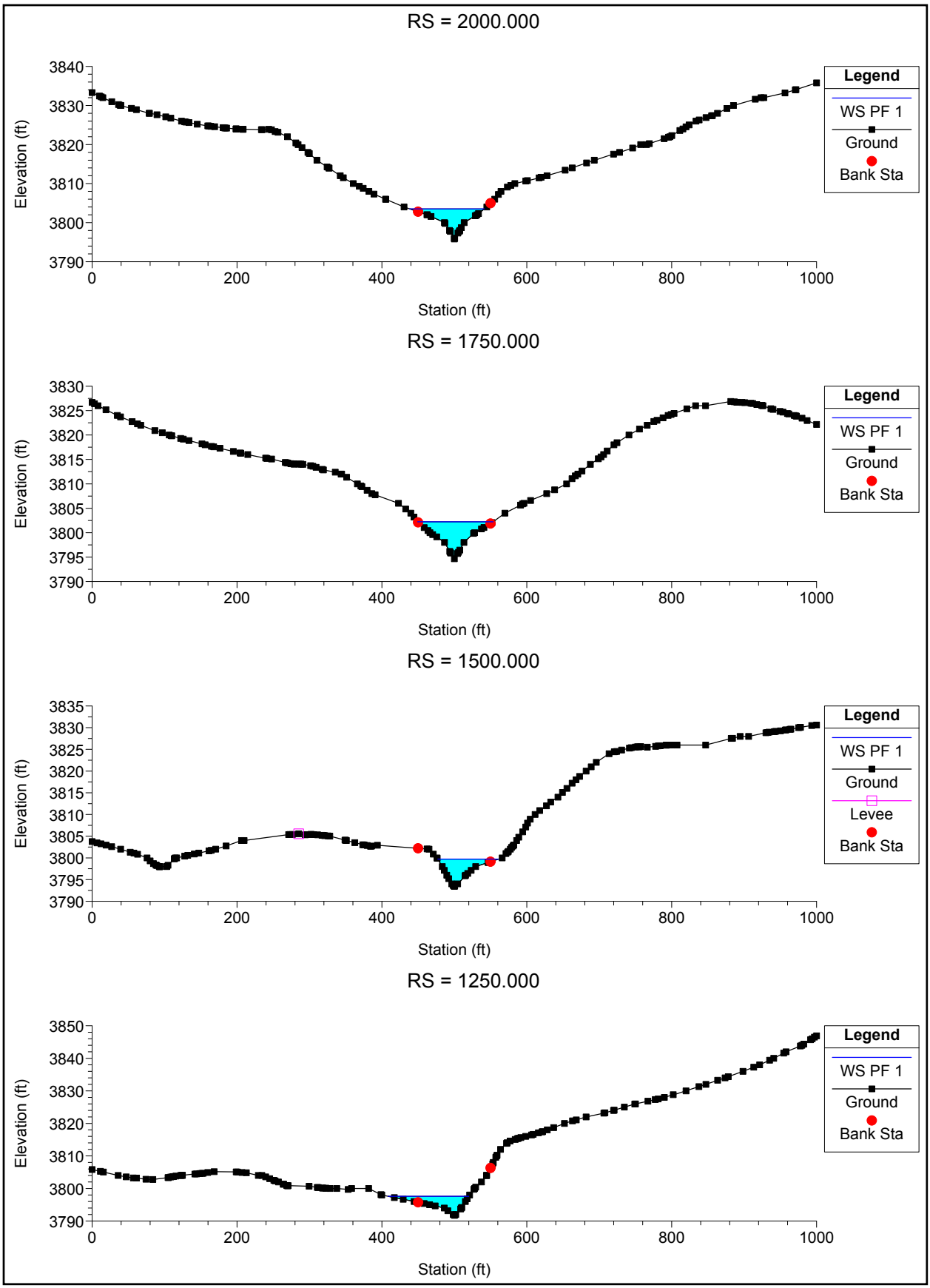
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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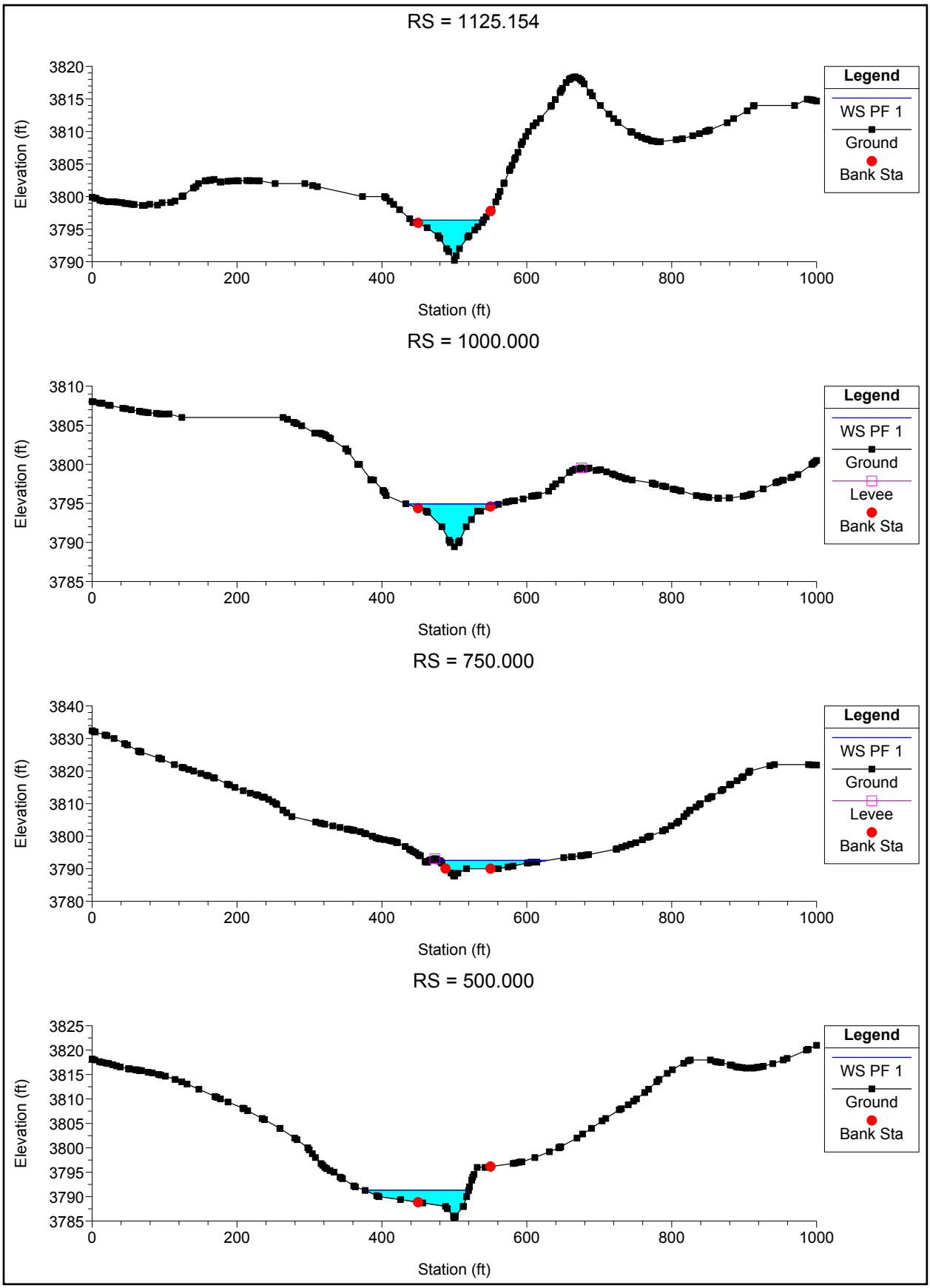
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
3830
3825
3820
3815
3810
3805
3800
3795
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
3835
3830
3825
3820
3815
3810
3805
3800
3795
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1250.000
Elevation (ft)
3850
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3810
3805
3800
3795
3790
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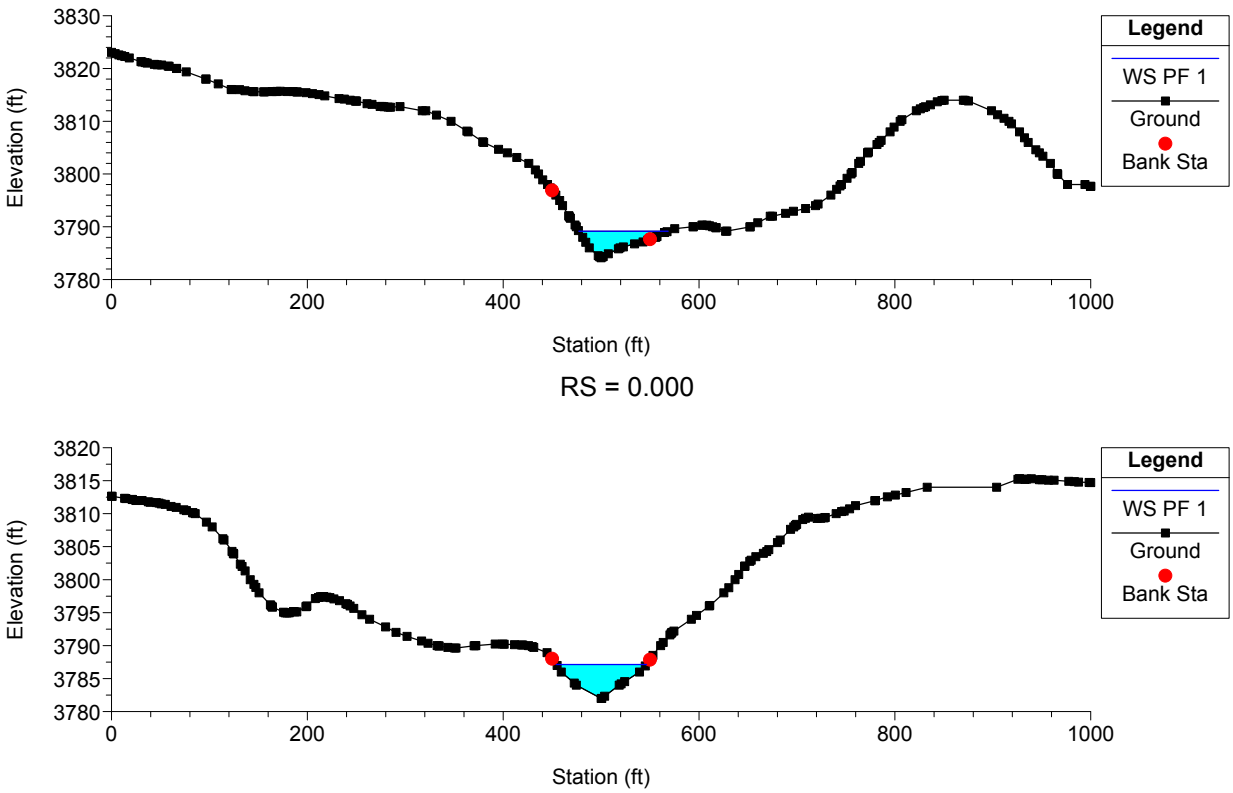
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3810
3805
3800
3795
3790
3785
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 750.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
3825
3820
3815
3810
3805
3800
3795
3790
3785
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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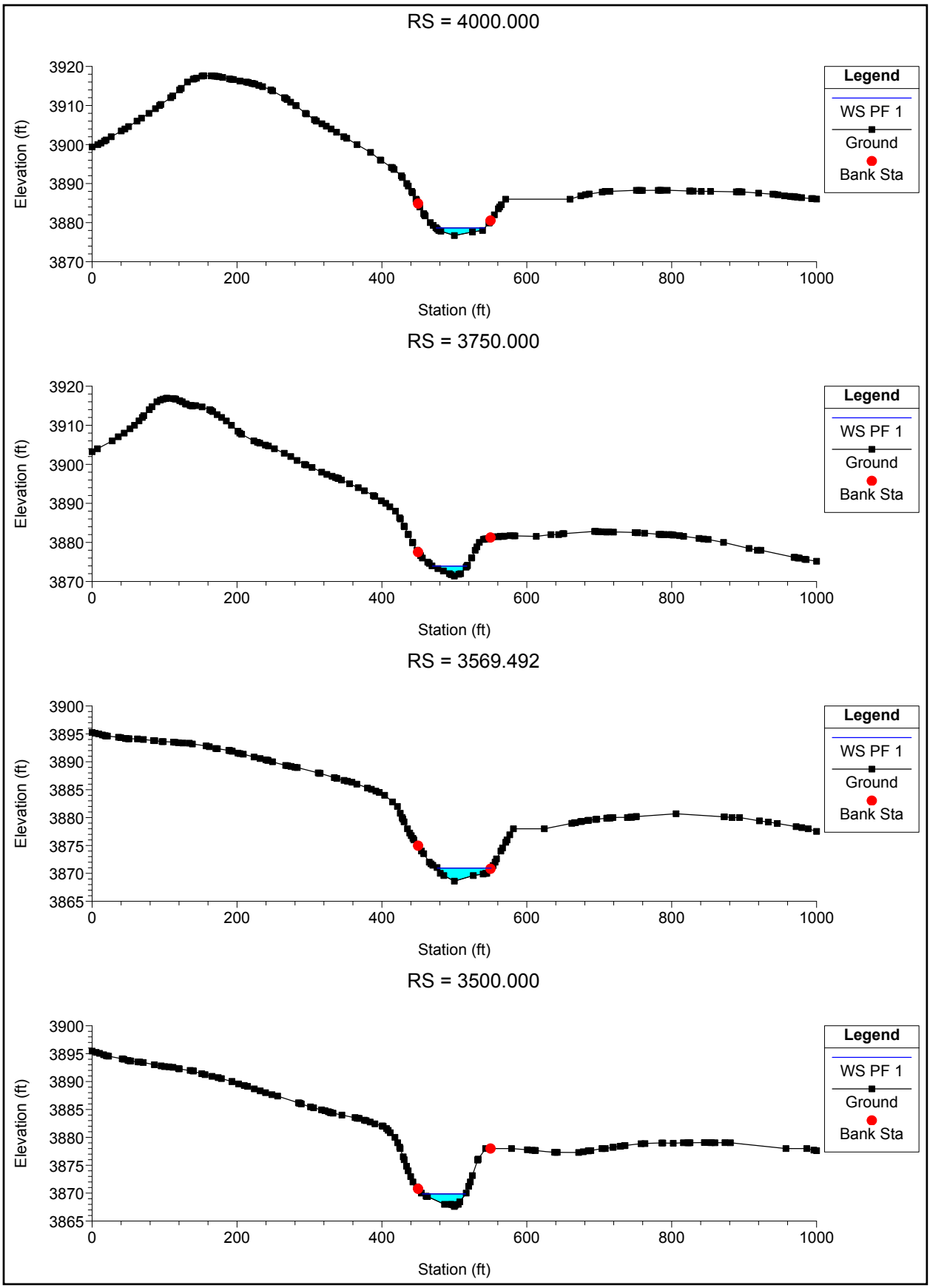
Elevation (ft)
3830
3820
3810
3800
3790
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 0.000
Elevation (ft)
3820
3815
3810
3805
3800
3795
3790
3785
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-26

# HEC-RAS Channel 14A

| 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) | |
| 14A | 4000 | PF 1 | 486 | 3876.71 | 3878.63 | 3878.64 | 3879.24 | 0.017538 | 6.23 | 78.07 | 66.82 | 1.01 |
| 14A | 3750 | PF 1 | 486 | 3871.4 | 3873.94 | 3874.03 | 3874.78 | 0.019636 | 7.37 | 65.95 | 47.5 | 1.1 |
| 14A | 3569.492 | PF 1 | 486 | 3868.61 | 3870.95 | 3870.58 | 3871.27 | 0.007083 | 4.56 | 106.51 | 74.26 | 0.67 |
| 14A | 3500 | PF 1 | 486 | 3867.62 | 3869.87 | 3869.87 | 3870.51 | 0.017001 | 6.45 | 75.37 | 59.66 | 1.01 |
| 14A | 3250 | PF 1 | 486 | 3863.07 | 3865.01 | 3865.27 | 3866.03 | 0.029115 | 8.12 | 59.86 | 50.25 | 1.31 |
| 14A | 3000 | PF 1 | 486 | 3859.23 | 3862.07 | 3862.05 | 3862.64 | 0.015007 | 6.07 | 80.78 | 75.14 | 0.95 |
| 14A | 2750 | PF 1 | 486 | 3856.16 | 3858.25 | 3858.25 | 3858.86 | 0.01634 | 6.3 | 77.28 | 62.95 | 0.99 |
| 14A | 2500 | PF 1 | 486 | 3848.34 | 3851.04 | 3851.6 | 3852.74 | 0.059203 | 10.48 | 46.38 | 44.87 | 1.82 |
| 14A | 2250 | PF 1 | 486 | 3844.06 | 3848.43 | 3847.68 | 3848.74 | 0.00532 | 4.52 | 107.42 | 59.79 | 0.59 |
| 14A | 2000 | PF 1 | 1428 | 3838.63 | 3844.89 | 3844.89 | 3846.27 | 0.01295 | 9.42 | 151.65 | 54.16 | 0.99 |
| 14A | 1750 | PF 1 | 1428 | 3835.03 | 3839.33 | 3840 | 3841.62 | 0.02955 | 12.16 | 117.41 | 53.53 | 1.45 |
| 14A | 1528.4 | PF 1 | 1428 | 3826.16 | 3829.31 | 3830.23 | 3832.45 | 0.074781 | 14.75 | 103.65 | 84.87 | 2.16 |
| 14A | 1250 | PF 1 | 1428 | 3821.59 | 3827.23 | 3827.03 | 3828.55 | 0.010668 | 9.21 | 155.01 | 49.48 | 0.92 |
| 14A | 1000 | PF 1 | 1428 | 3820.37 | 3824.39 | 3824.39 | 3825.48 | 0.013745 | 8.39 | 170.3 | 77.57 | 1 |
| 14A | 539.691 | PF 1 | 1428 | 3813.73 | 3819.49 | 3818.89 | 3820.21 | 0.005845 | 6.92 | 219.24 | 93.18 | 0.68 |
| 14A | 500 | PF 1 | 1428 | 3813.21 | 3818.77 | 3818.63 | 3819.86 | 0.011181 | 8.38 | 170.89 | 71.07 | 0.91 |
| 14A | 250 | PF 1 | 1428 | 3809.98 | 3815.55 | 3815.55 | 3816.85 | 0.01295 | 9.17 | 155.66 | 58.39 | 0.99 |
| 14A | 0 | PF 1 | 1428 | 3805.77 | 3809.89 | 3810.64 | 3812.27 | 0.028592 | 12.38 | 115.33 | 50.15 | 1.44 |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3910
3900
3890
3880
3870
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3750.000
Elevation (ft)
3920
3910
3900
3890
3880
3870
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3569.492
Elevation (ft)
3900
3895
3890
3885
3880
3875
3870
3865
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3500.000
Elevation (ft)
3900
3895
3890
3885
3880
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3870
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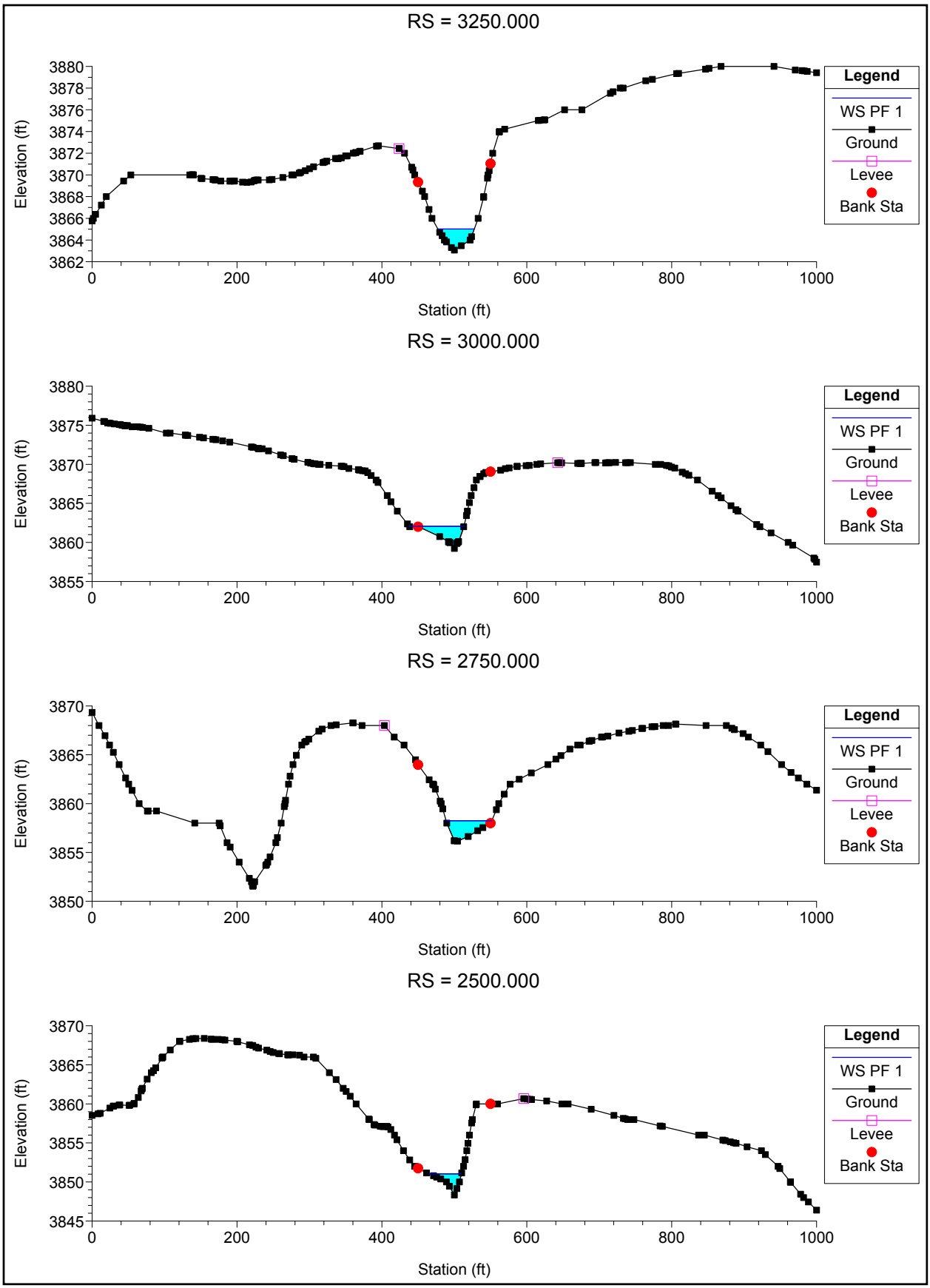
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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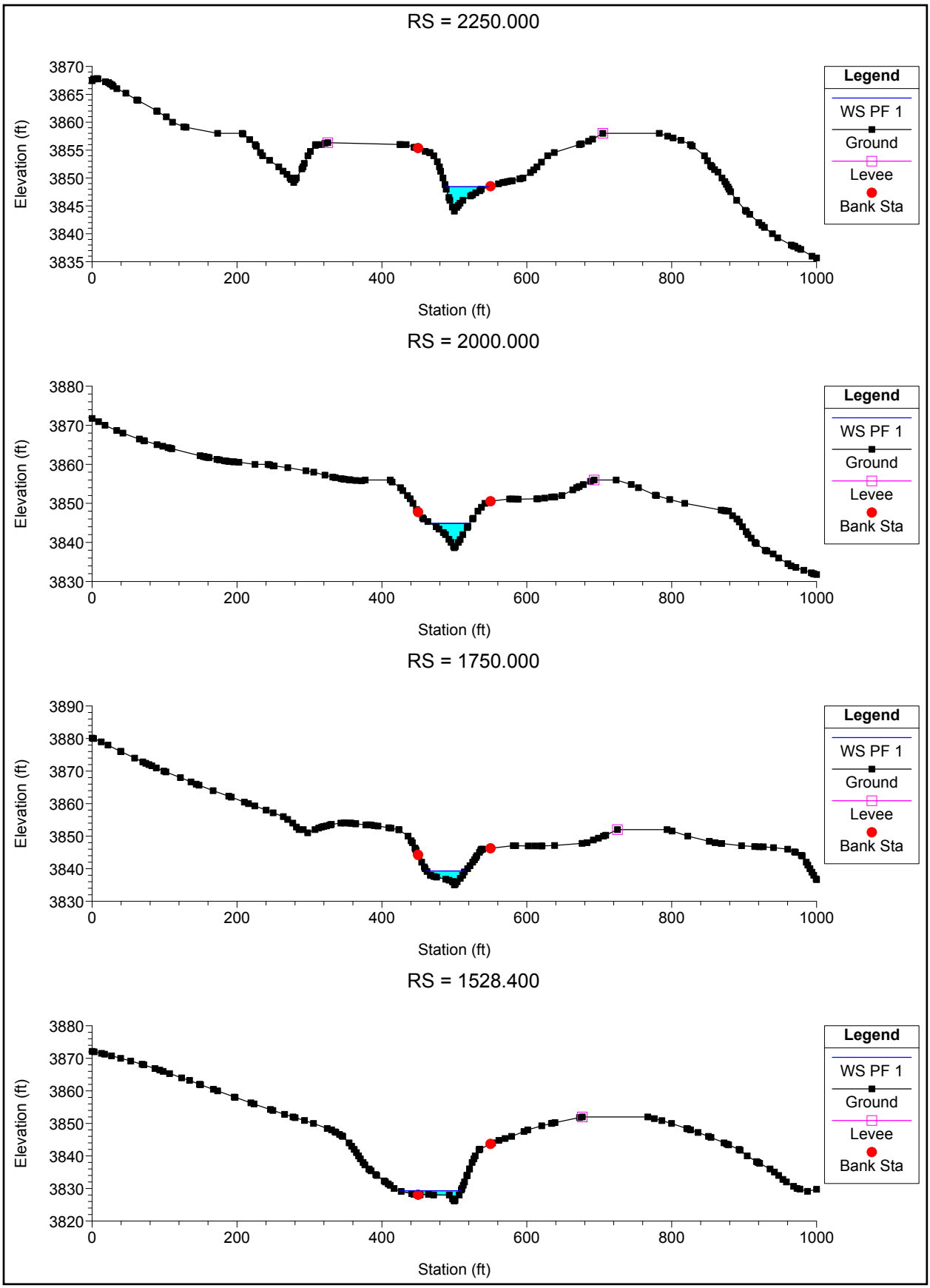
3874
3872
3870
3868
3866
3864
3862
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3000.000
Elevation (ft)
3880
3875
3870
3865
3860
3855
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2750.000
Elevation (ft)
3870
3865
3860
3855
3850
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2500.000
Elevation (ft)
3870
3865
3860
3855
3850
3845
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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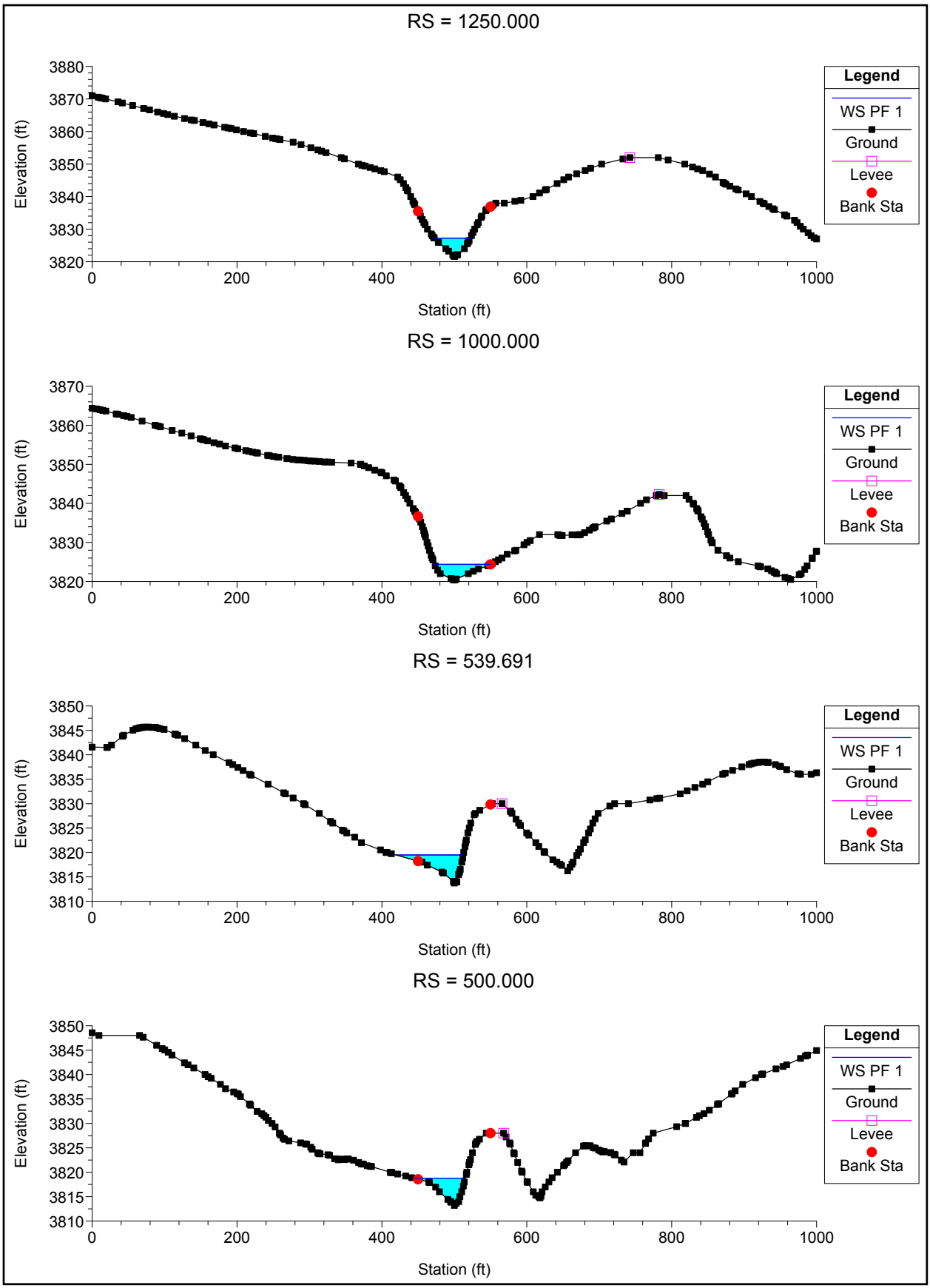
Elevation (ft)
3870
3865
3860
3855
3850
3845
3840
3835
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 2000.000
Elevation (ft)
3880
3870
3860
3850
3840
3830
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
3890
3880
3870
3860
3850
3840
3830
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1528.400
Elevation (ft)
3880
3870
3860
3850
3840
3830
3820
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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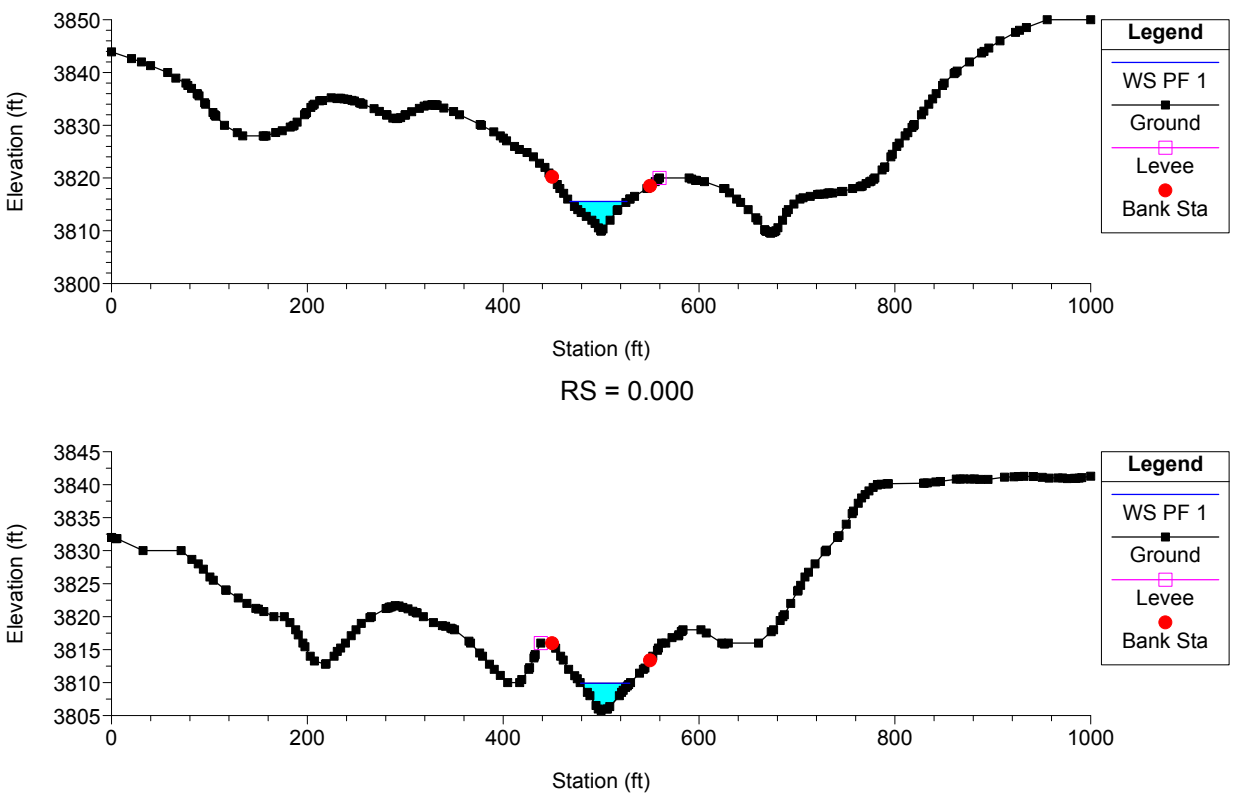
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 539.691
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

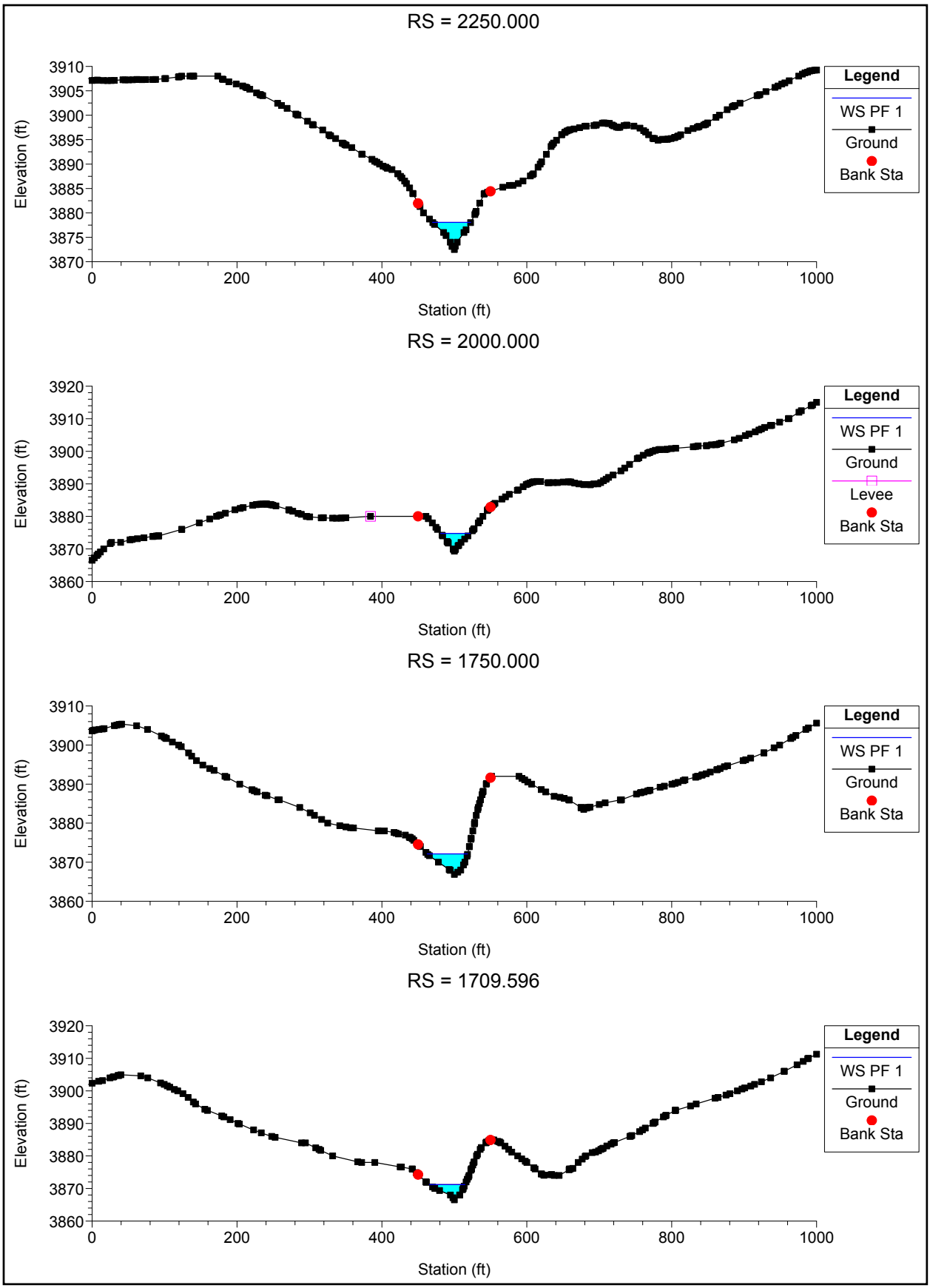

RS = 250.000
Elevation (ft)
3850
3840
3830
3820
3810
3800
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta


RS = 0.000
Elevation (ft)
3845
3840
3835
3830
3825
3820
3815
3810
3805
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-27

# HEC-RAS Channel 14B

| 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) | |
| 14B | 2250 | PF 1 | 972 | 3872.5 | 3878.06 | 3877.75 | 3878.95 | 0.009944 | 7.55 | 128.7 | 52.71 | 0.85 |
| 14B | 2000 | PF 1 | 972 | 3869.32 | 3874.79 | 3874.79 | 3876.1 | 0.013853 | 9.2 | 105.69 | 40.82 | 1.01 |
| 14B | 1750 | PF 1 | 972 | 3866.89 | 3872.13 | 3871.23 | 3872.71 | 0.005297 | 6.12 | 158.9 | 55.7 | 0.64 |
| 14B | 1709.596 | PF 1 | 972 | 3866.52 | 3871.21 | 3871.16 | 3872.34 | 0.013384 | 8.5 | 114.34 | 48.98 | 0.98 |
| 14B | 1500 | PF 1 | 972 | 3864.41 | 3868.79 | 3868.58 | 3869.82 | 0.010785 | 8.12 | 119.64 | 46.88 | 0.9 |
| 14B | 1231.288 | PF 1 | 972 | 3861.74 | 3865.5 | 3865.5 | 3866.6 | 0.013988 | 8.43 | 115.32 | 52.4 | 1 |
| 14B | 950.885 | PF 1 | 972 | 3858.88 | 3861.24 | 3861.48 | 3862.43 | 0.023974 | 8.76 | 110.96 | 71.84 | 1.24 |
| 14B | 750 | PF 1 | 972 | 3855.09 | 3858.82 | 3858.79 | 3859.82 | 0.013709 | 8.05 | 120.69 | 57.94 | 0.98 |
| 14B | 500 | PF 1 | 972 | 3851.37 | 3855.35 | 3855.35 | 3856.31 | 0.014573 | 7.87 | 123.45 | 64.26 | 1 |
| 14B | 250 | PF 1 | 972 | 3846.2 | 3850.7 | 3851.08 | 3852.3 | 0.022469 | 10.13 | 95.93 | 46.81 | 1.25 |
| 14B | 0 | PF 1 | 972 | 3842 | 3846.5 | 3846.21 | 3847.33 | 0.010007 | 7.29 | 133.39 | 58.65 | 0.85 |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WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
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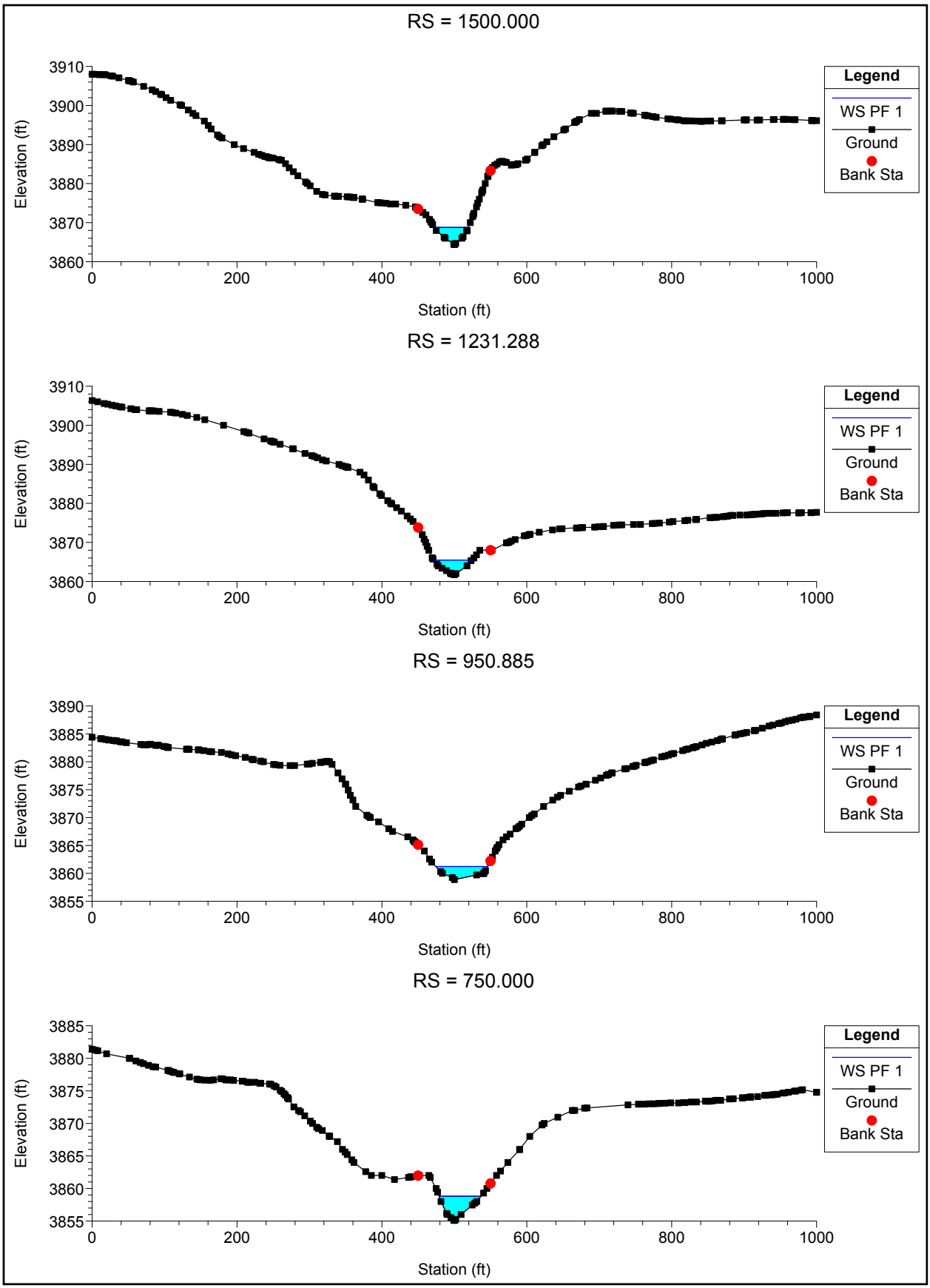
Ground
Levee
Bank Sta
RS = 1750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1709.596
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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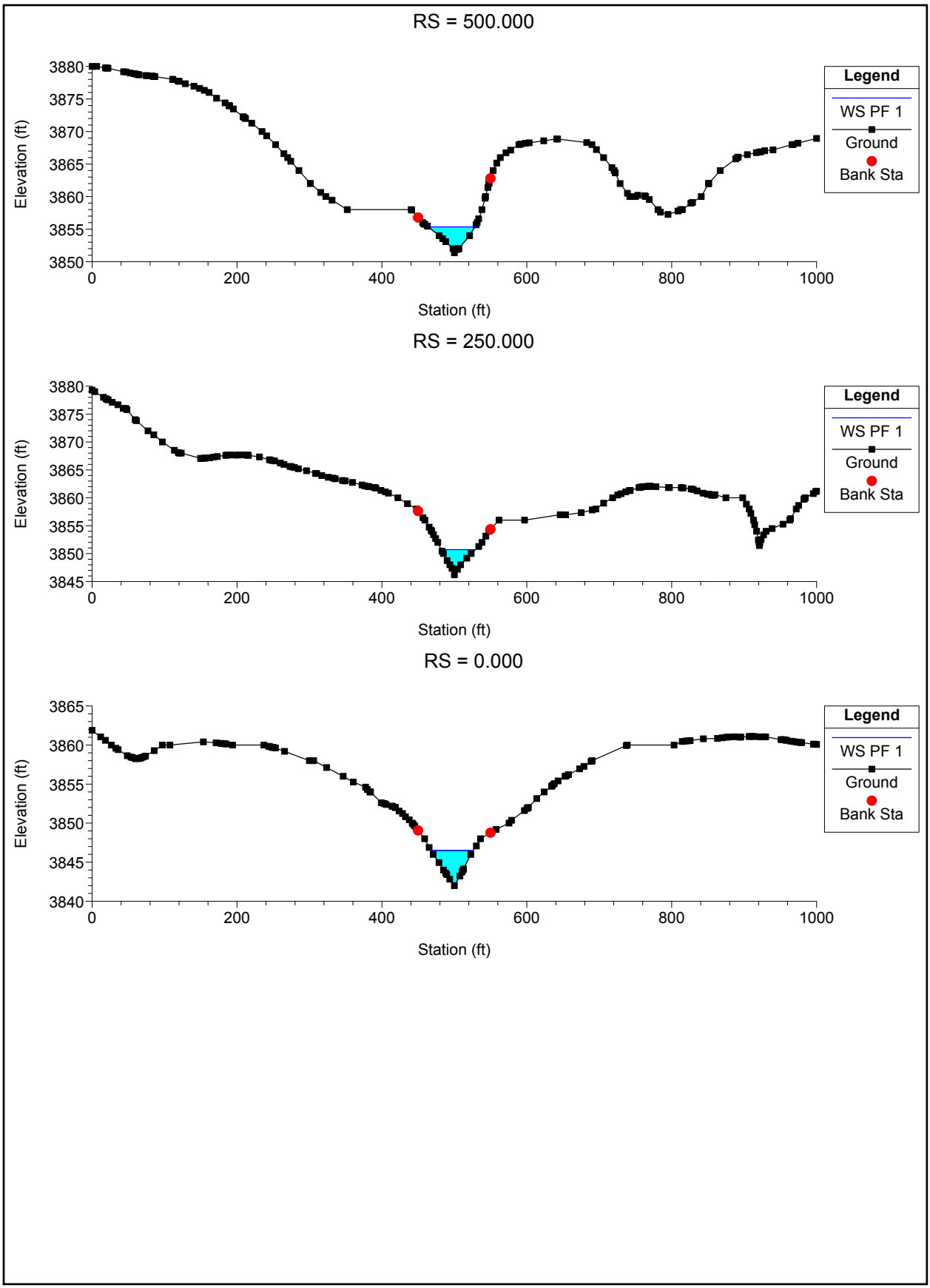
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1231.288
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 950.885
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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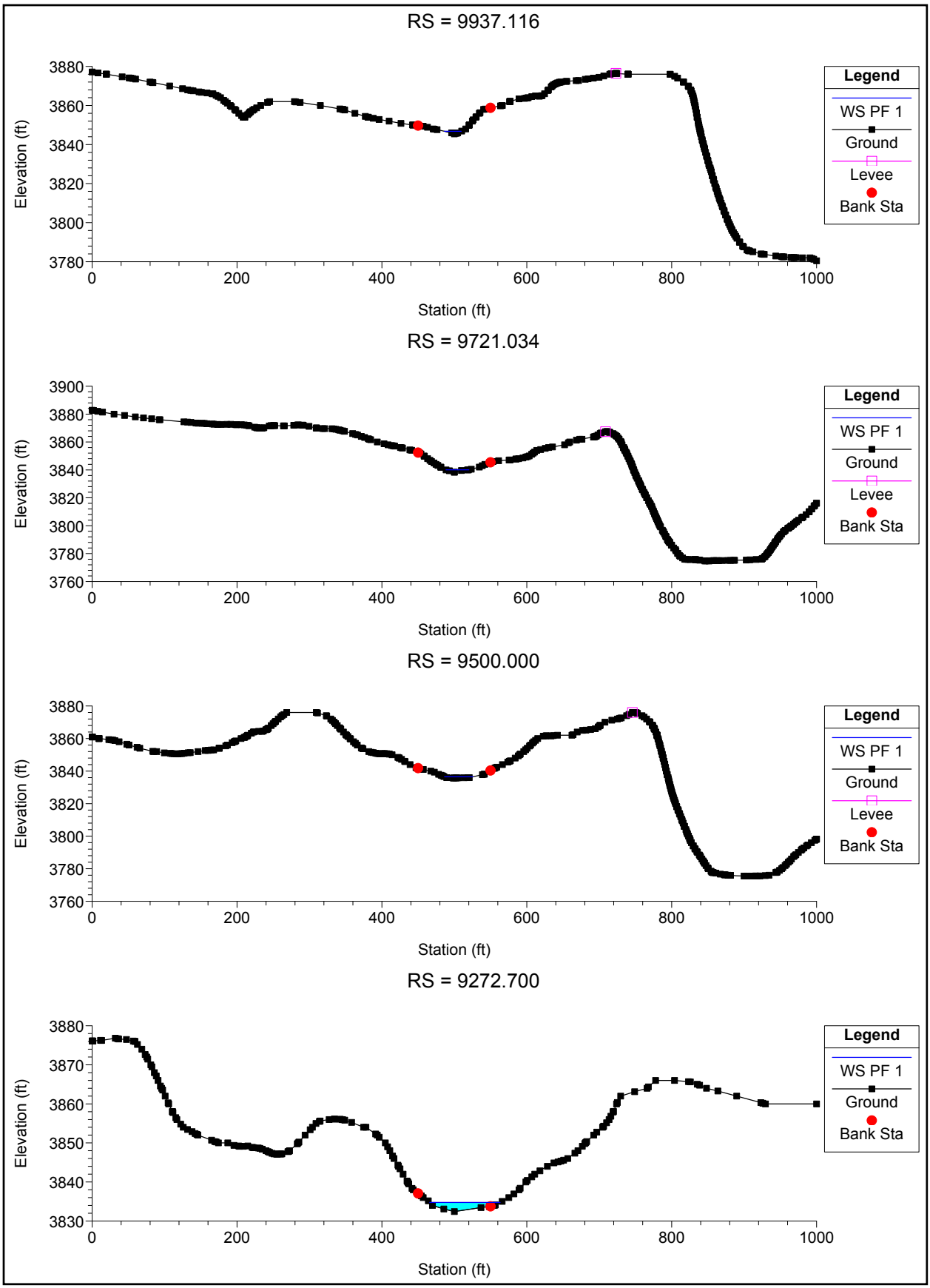
3880
3875
3870
3865
3860
3855
3850
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3880
3875
3870
3865
3860
3855
3850
3845
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 0.000
Elevation (ft)
3865
3860
3855
3850
3845
3840
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-28

# HEC-RAS Channel 15

| 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) | |
| 15 | 9937.116 | PF 1 | 93 | 3845.42 | 3846.79 | 3846.97 | 3847.4 | 0.040061 | 6.27 | 14.82 | 23.19 | 1.38 |
| 15 | 9721.034 | PF 1 | 93 | 3838.34 | 3840.08 | 3839.94 | 3840.31 | 0.012367 | 3.89 | 23.89 | 31.7 | 0.79 |
| 15 | 9500 | PF 1 | 93 | 3835.75 | 3836.51 | 3836.51 | 3836.79 | 0.021918 | 4.25 | 21.9 | 39.36 | 1 |
| 15 | 9272.7 | PF 1 | 93 | 3832.43 | 3834.77 | 3833.34 | 3834.78 | 0.000141 | 0.68 | 140.18 | 97.16 | 0.1 |
| 15 | 9024.141 | PF 1 | 93 | 3833.61 | 3834.74 | 3833.98 | 3834.74 | 0.00016 | 0.56 | 181.51 | 199.6 | 0.1 |
| 15 | 8976.173 | PF 1 | 93 | 3833.99 | 3834.54 | 3834.54 | 3834.7 | 0.024392 | 3.19 | 29.47 | 91.35 | 0.97 |
| 15 | 8750 | PF 1 | 124 | 3822 | 3824.72 | 3822.8 | 3824.73 | 0.000173 | 0.87 | 142.47 | 72.91 | 0.11 |
| 15 | 8530.177 | PF 1 | 124 | 3823.57 | 3824.3 | 3824.3 | 3824.57 | 0.024353 | 4.22 | 29.4 | 57.82 | 1.04 |
| 15 | 8250 | PF 1 | 523 | 3810.09 | 3812.43 | 3813.03 | 3814.35 | 0.042955 | 11.11 | 47.07 | 32.72 | 1.63 |
| 15 | 8000 | PF 1 | 523 | 3803.33 | 3806.7 | 3806.81 | 3807.88 | 0.016915 | 8.72 | 59.97 | 29.33 | 1.07 |
| 15 | 7750 | PF 1 | 523 | 3796.82 | 3799.75 | 3800.34 | 3801.66 | 0.043507 | 11.12 | 47.05 | 32.9 | 1.64 |
| 15 | 7500 | PF 1 | 523 | 3786.04 | 3789.28 | 3790.03 | 3791.61 | 0.042957 | 12.25 | 42.71 | 25.17 | 1.66 |
| 15 | 7335.37 | PF 1 | 523 | 3781.41 | 3783.78 | 3784.18 | 3785.12 | 0.034549 | 9.31 | 56.18 | 43.5 | 1.44 |
| 15 | 7158.977 | PF 1 | 523 | 3778.69 | 3781.67 | 3781.67 | 3782.53 | 0.015629 | 7.45 | 70.18 | 41.63 | 1.01 |
| 15 | 7063.619 | PF 1 | 523 | 3777.34 | 3778.82 | 3779.18 | 3780.03 | 0.056273 | 9 | 59.8 | 75.03 | 1.72 |
| 15 | 7000 | PF 1 | 523 | 3776.44 | 3778.38 | 3778.38 | 3778.88 | 0.01729 | 5.73 | 93.07 | 97.63 | 0.99 |
| 15 | 6750 | PF 1 | 523 | 3770.82 | 3772.7 | 3772.94 | 3773.6 | 0.037033 | 7.63 | 69 | 80.42 | 1.41 |
| 15 | 6500 | PF 1 | 523 | 3763.16 | 3767.41 | 3767.41 | 3768.3 | 0.016011 | 7.58 | 69.02 | 39.9 | 1.02 |
| 15 | 6250 | PF 1 | 523 | 3759.68 | 3763.41 | 3763.46 | 3764.52 | 0.016253 | 8.44 | 61.97 | 30.62 | 1.05 |
| 15 | 6000 | PF 1 | 523 | 3756.41 | 3759.42 | 3759.18 | 3759.9 | 0.010415 | 5.55 | 94.23 | 64.67 | 0.81 |
| 15 | 5750 | PF 1 | 523 | 3751.98 | 3755.83 | 3755.83 | 3756.85 | 0.014681 | 8.08 | 64.73 | 31.87 | 1 |
| 15 | 5500 | PF 1 | 523 | 3747.75 | 3751.45 | 3751.64 | 3752.38 | 0.022705 | 7.74 | 67.55 | 49.93 | 1.17 |
| 15 | 5250 | PF 1 | 523 | 3744.35 | 3748.27 | 3748.27 | 3749.24 | 0.015193 | 7.89 | 66.33 | 34.94 | 1.01 |
| 15 | 5000 | PF 1 | 523 | 3739.7 | 3742.77 | 3743.23 | 3744.34 | 0.028989 | 10.04 | 52.07 | 31.14 | 1.37 |
| 15 | 4750 | PF 1 | 523 | 3735.92 | 3739.8 | 3739.72 | 3740.56 | 0.013521 | 7.02 | 74.55 | 42.93 | 0.94 |
| 15 | 4527.43 | PF 1 | 523 | 3733.1 | 3737.09 | 3737.09 | 3737.93 | 0.015544 | 7.36 | 71.03 | 42.36 | 1 |
| 15 | 4190.778 | PF 1 | 523 | 3727.11 | 3730.47 | 3730.84 | 3731.9 | 0.027596 | 9.59 | 54.52 | 33.59 | 1.33 |
| 15 | 4000 | PF 1 | 523 | 3724.23 | 3728.15 | 3728.15 | 3729.08 | 0.015037 | 7.73 | 67.67 | 36.53 | 1 |
| 15 | 3813.78 | PF 1 | 523 | 3721.34 | 3724.97 | 3725.14 | 3726.07 | 0.019013 | 8.4 | 62.24 | 35.41 | 1.12 |
| 15 | 3500 | PF 1 | 523 | 3717.4 | 3721.32 | 3720.76 | 3721.75 | 0.006799 | 5.24 | 99.82 | 53.81 | 0.68 |
| 15 | 3250 | PF 1 | 523 | 3715.17 | 3718.5 | 3718.5 | 3719.34 | 0.015309 | 7.39 | 70.78 | 41.84 | 1 |
| 15 | 2988.407 | PF 1 | 523 | 3710.51 | 3713.37 | 3713.73 | 3714.69 | 0.030562 | 9.22 | 56.72 | 40.47 | 1.37 |
| 15 | 2750 | PF 1 | 523 | 3706.6 | 3710.8 | 3710.8 | 3711.71 | 0.015765 | 7.67 | 68.18 | 38.37 | 1.01 |
| 15 | 2500 | PF 1 | 523 | 3703.2 | 3708.02 | 3707.67 | 3708.78 | 0.009812 | 6.99 | 74.77 | 33.08 | 0.82 |
| 15 | 2250 | PF 1 | 523 | 3700.67 | 3704.82 | 3704.82 | 3705.79 | 0.014999 | 7.87 | 66.43 | 34.63 | 1 |
| 15 | 2000 | PF 1 | 523 | 3696.86 | 3701.17 | 3701.5 | 3702.66 | 0.022959 | 9.78 | 53.47 | 27.05 | 1.23 |
| 15 | 1750 | PF 1 | 523 | 3693.49 | 3697.87 | 3697.85 | 3698.85 | 0.01433 | 7.97 | 65.63 | 32.06 | 0.98 |
| 15 | 1500 | PF 1 | 523 | 3691.45 | 3695.08 | 3695.08 | 3696.07 | 0.014878 | 7.99 | 65.44 | 33 | 1 |
| 15 | 1250 | PF 1 | 523 | 3689.43 | 3693.29 | 3692.47 | 3693.7 | 0.005377 | 5.14 | 101.8 | 47.22 | 0.62 |
| 15 | 967.464 | PF 1 | 523 | 3686.56 | 3690.49 | 3690.49 | 3691.31 | 0.01579 | 7.27 | 71.91 | 44.04 | 1 |
| 15 | 750 | PF 1 | 523 | 3683.27 | 3686.8 | 3686.95 | 3687.95 | 0.018216 | 8.62 | 60.69 | 31.99 | 1.1 |
| 15 | 573.458 | PF 1 | 523 | 3680.47 | 3684.8 | 3684.76 | 3685.76 | 0.014161 | 7.85 | 66.65 | 33.26 | 0.98 |
| 15 | 500 | PF 1 | 523 | 3679.53 | 3684.28 | | 3684.86 | 0.00841 | 6.14 | 85.2 | 41.82 | 0.76 |
| 15 | 250 | PF 1 | 523 | 3676.58 | 3681.16 | 3681.16 | 3682.19 | 0.015196 | 8.15 | 64.13 | 31.37 | 1.01 |
| 15 | 0 | PF 1 | 523 | 3674 | 3677.86 | 3677.6 | 3678.55 | 0.010017 | 6.69 | 78.58 | 40.65 | 0.83 |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1000
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Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9721.034
Elevation (ft)
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3880
3860
3840
3820
3800
3780
3760
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9500.000
Elevation (ft)
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3860
3840
3820
3800
3780
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 9272.700
Elevation (ft)
3880
3870
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3840
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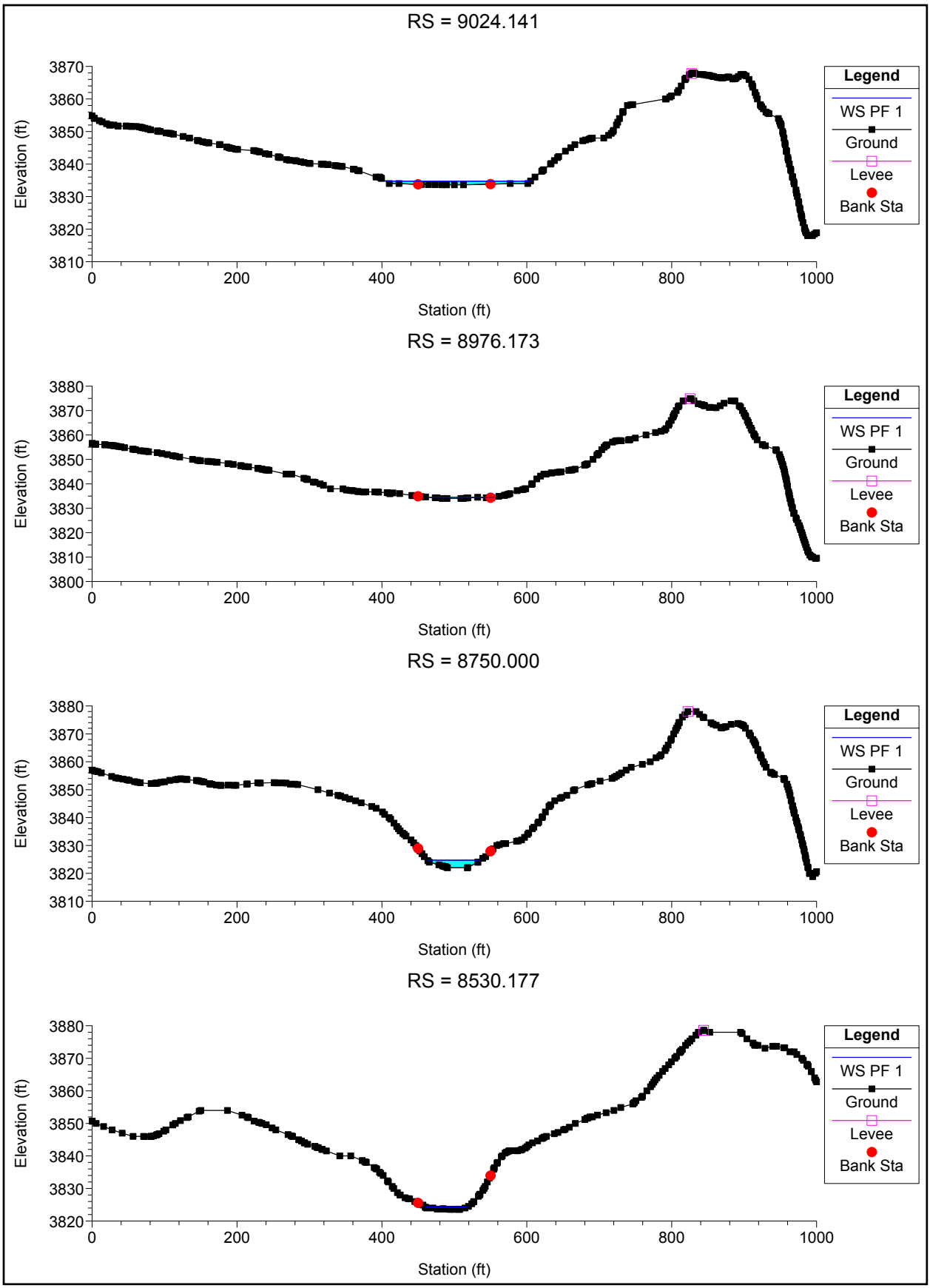
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 8750.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
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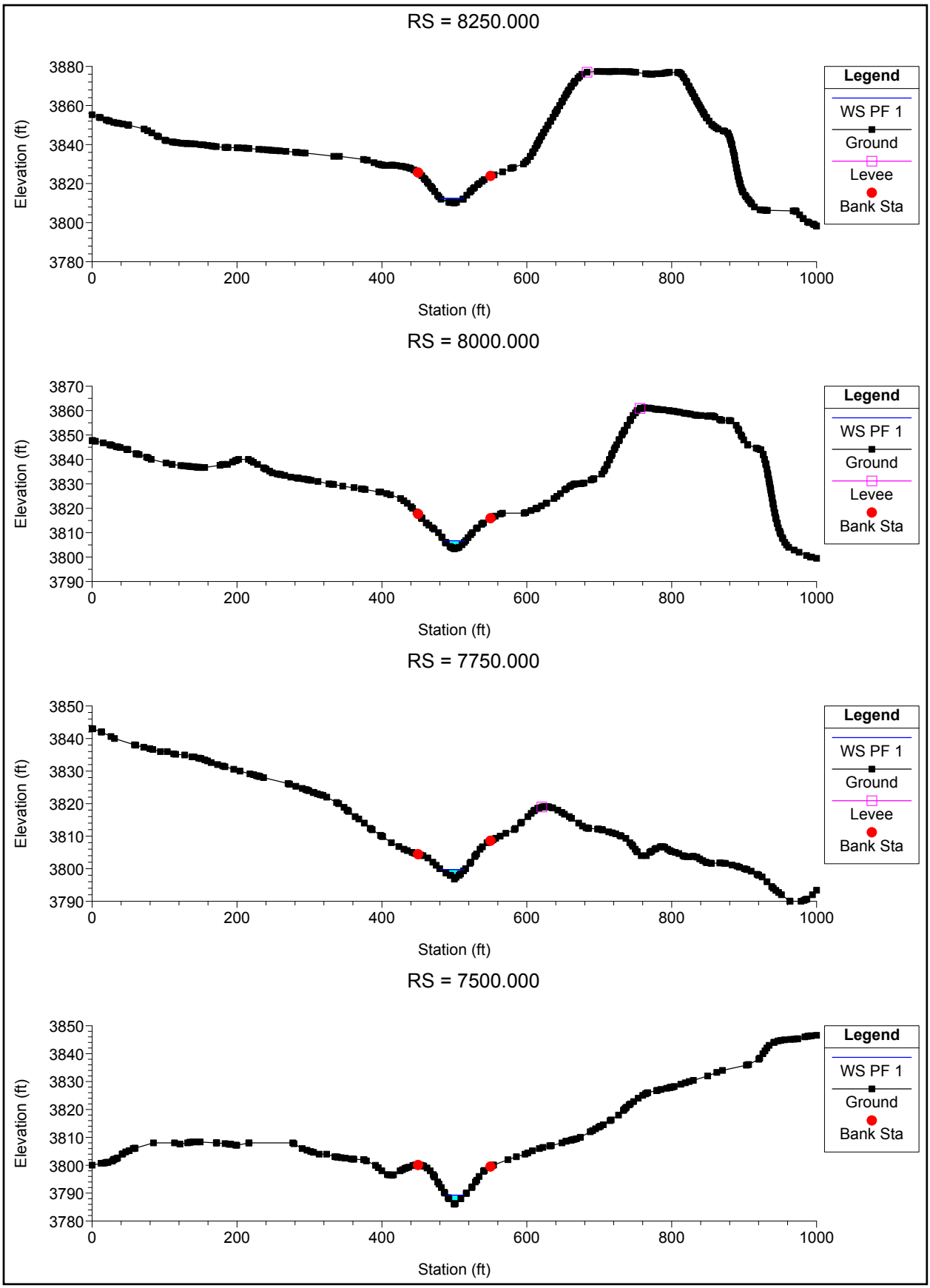
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 8000.000
Elevation (ft)
3870
3860
3850
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7750.000
Elevation (ft)
3850
3840
3830
3820
3810
3800
3790
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 7500.000
Elevation (ft)
3850
3840
3830
3820
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3780
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600
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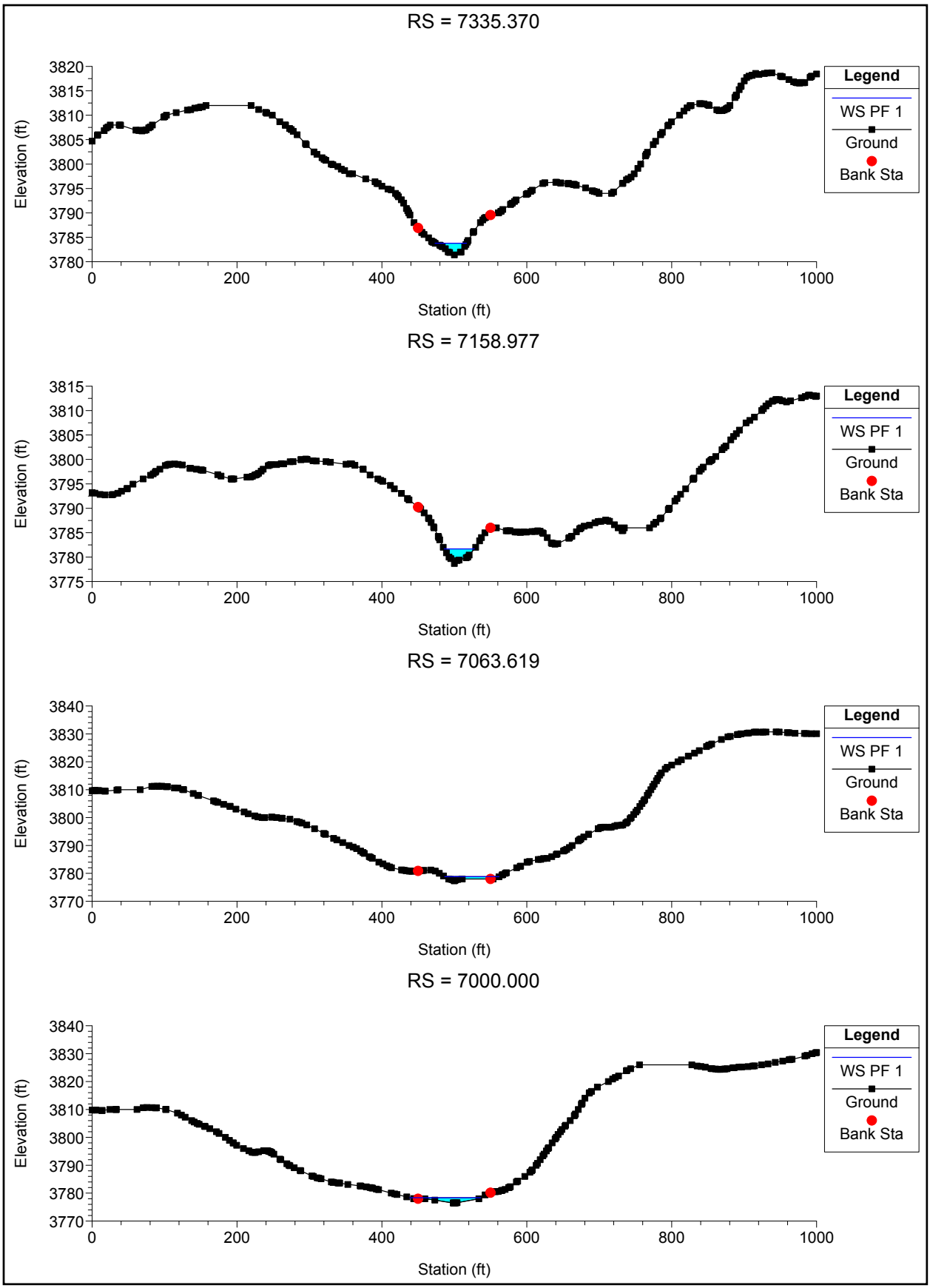
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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3785
3780
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600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7158.977
Elevation (ft)
3815
3810
3805
3800
3795
3790
3785
3780
3775
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400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
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Elevation (ft)
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3820
3810
3800
3790
3780
3770
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 7000.000
Elevation (ft)
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3830
3820
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600
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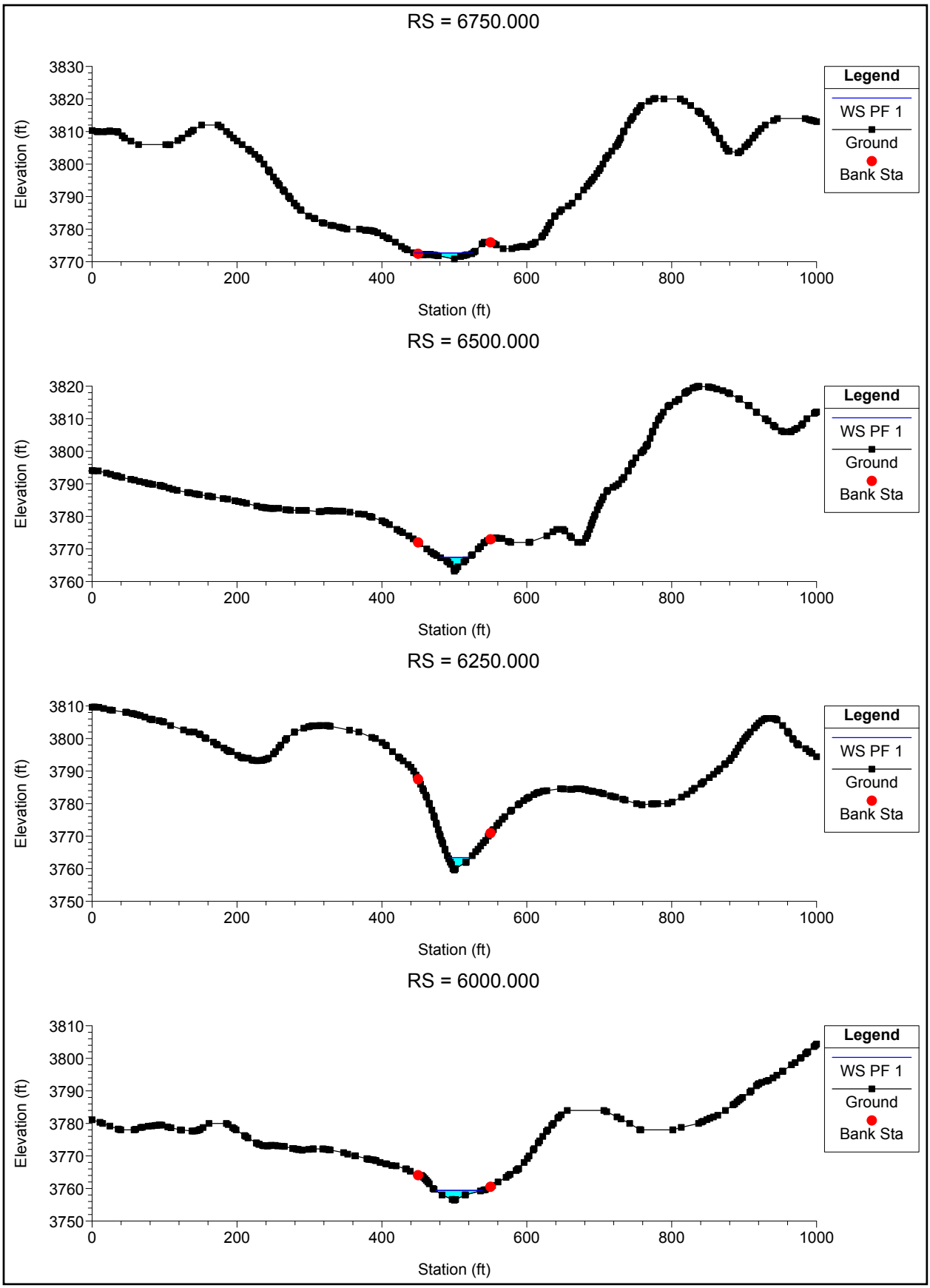
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6500.000
Elevation (ft)
3820
3810
3800
3790
3780
3770
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6250.000
Elevation (ft)
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3800
3790
3780
3770
3760
3750
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 6000.000
Elevation (ft)
3810
3800
3790
3780
3770
3760
3750
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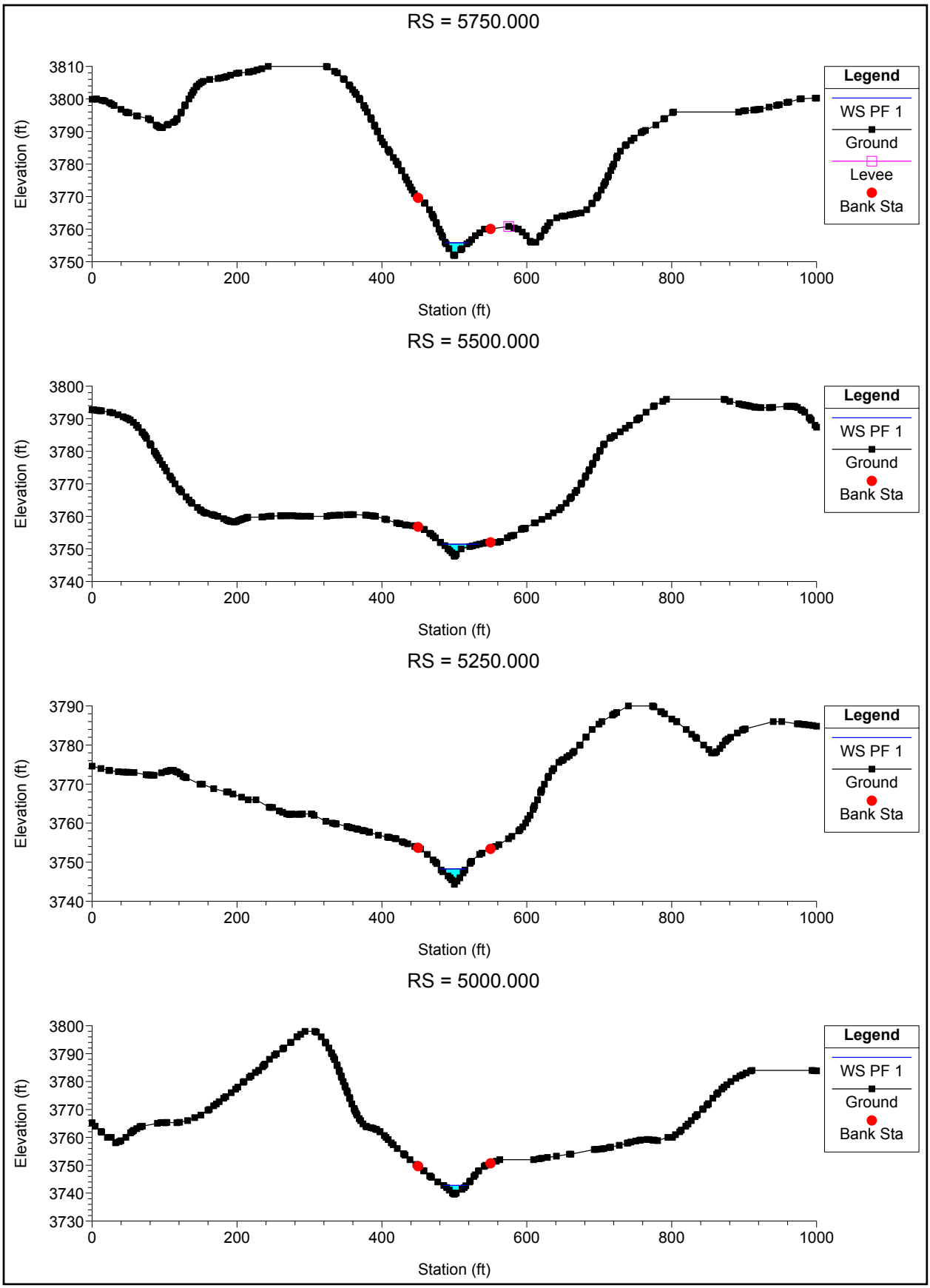
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
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3750
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 5500.000
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5250.000
Elevation (ft)
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 5000.000
Elevation (ft)
3800
3790
3780
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3740
3730
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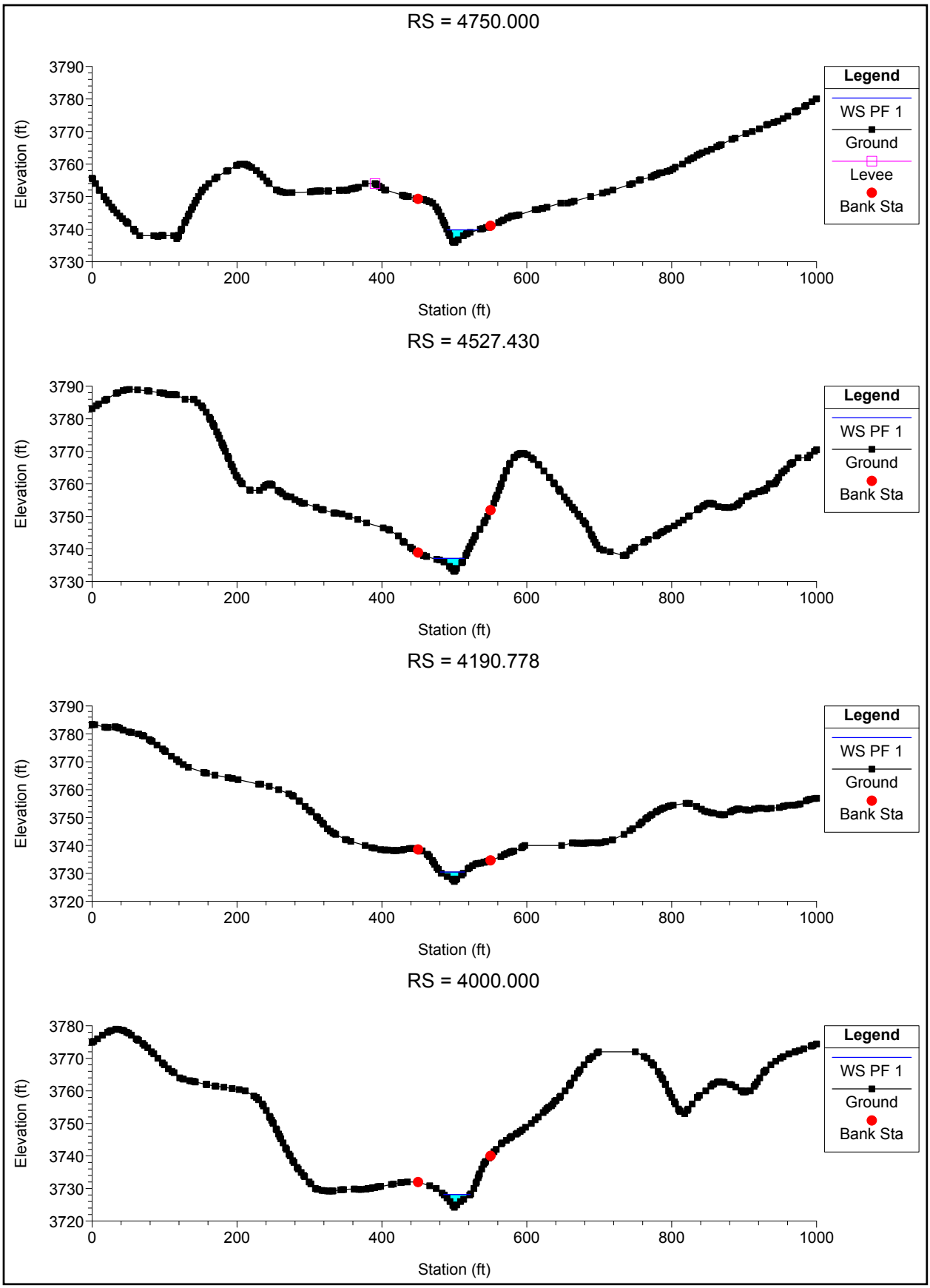
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Elevation (ft)
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3770
3760
3750
3740
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 4527.430
Elevation (ft)
3790
3780
3770
3760
3750
3740
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4190.778
Elevation (ft)
3790
3780
3770
3760
3750
3740
3730
3720
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 4000.000
Elevation (ft)
3780
3770
3760
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3740
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3720
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200
400
600
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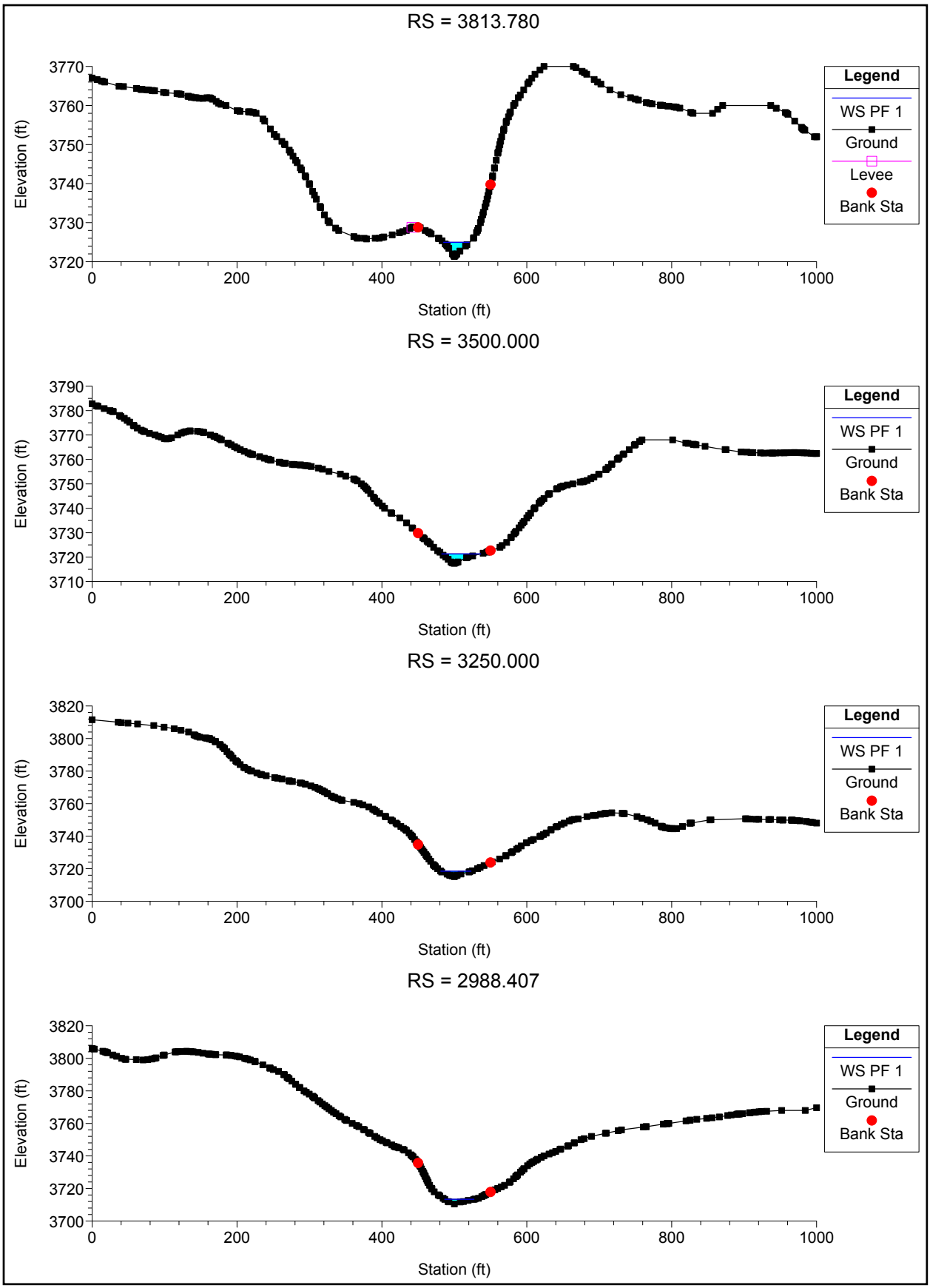
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 3813.780
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3770
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3740
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200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 3500.000
Elevation (ft)
3790
3780
3770
3760
3750
3740
3730
3720
3710
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 3250.000
Elevation (ft)
3820
3800
3780
3760
3740
3720
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2988.407
Elevation (ft)
3820
3800
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3760
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3720
3700
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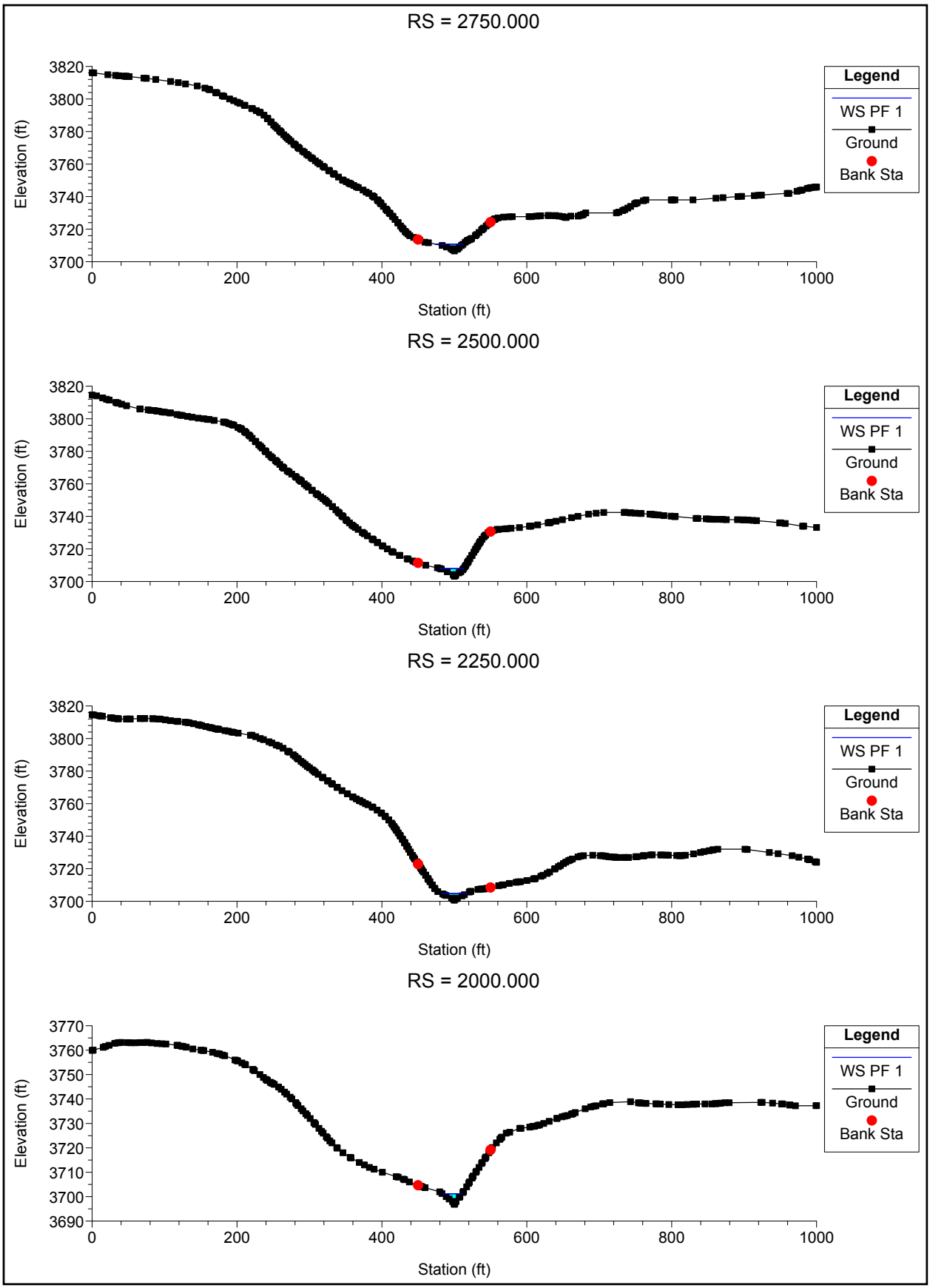
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 2750.000
Elevation (ft)
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3760
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3720
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2500.000
Elevation (ft)
3820
3800
3780
3760
3740
3720
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2250.000
Elevation (ft)
3820
3800
3780
3760
3740
3720
3700
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
3770
3760
3750
3740
3730
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3710
3700
3690
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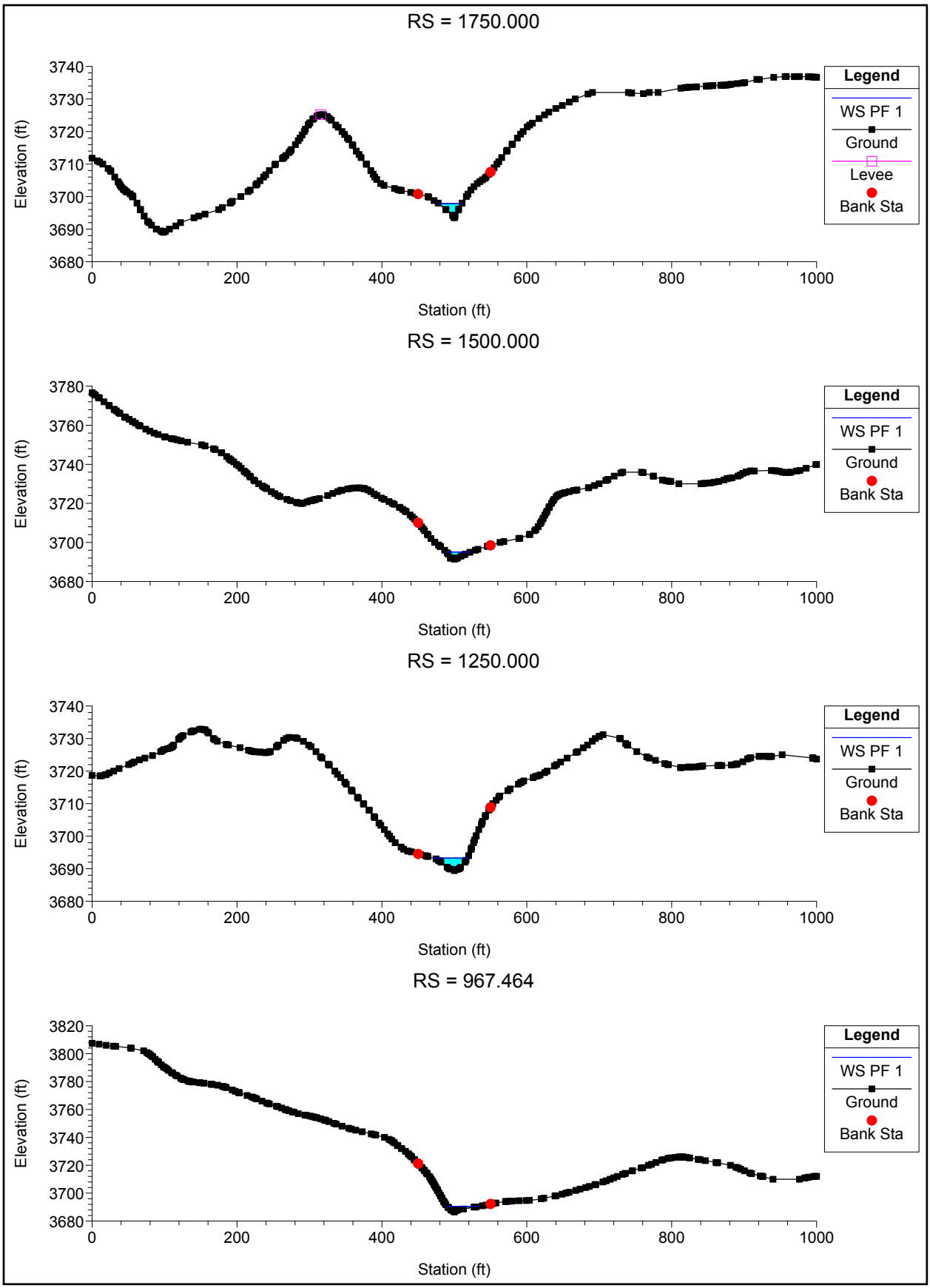
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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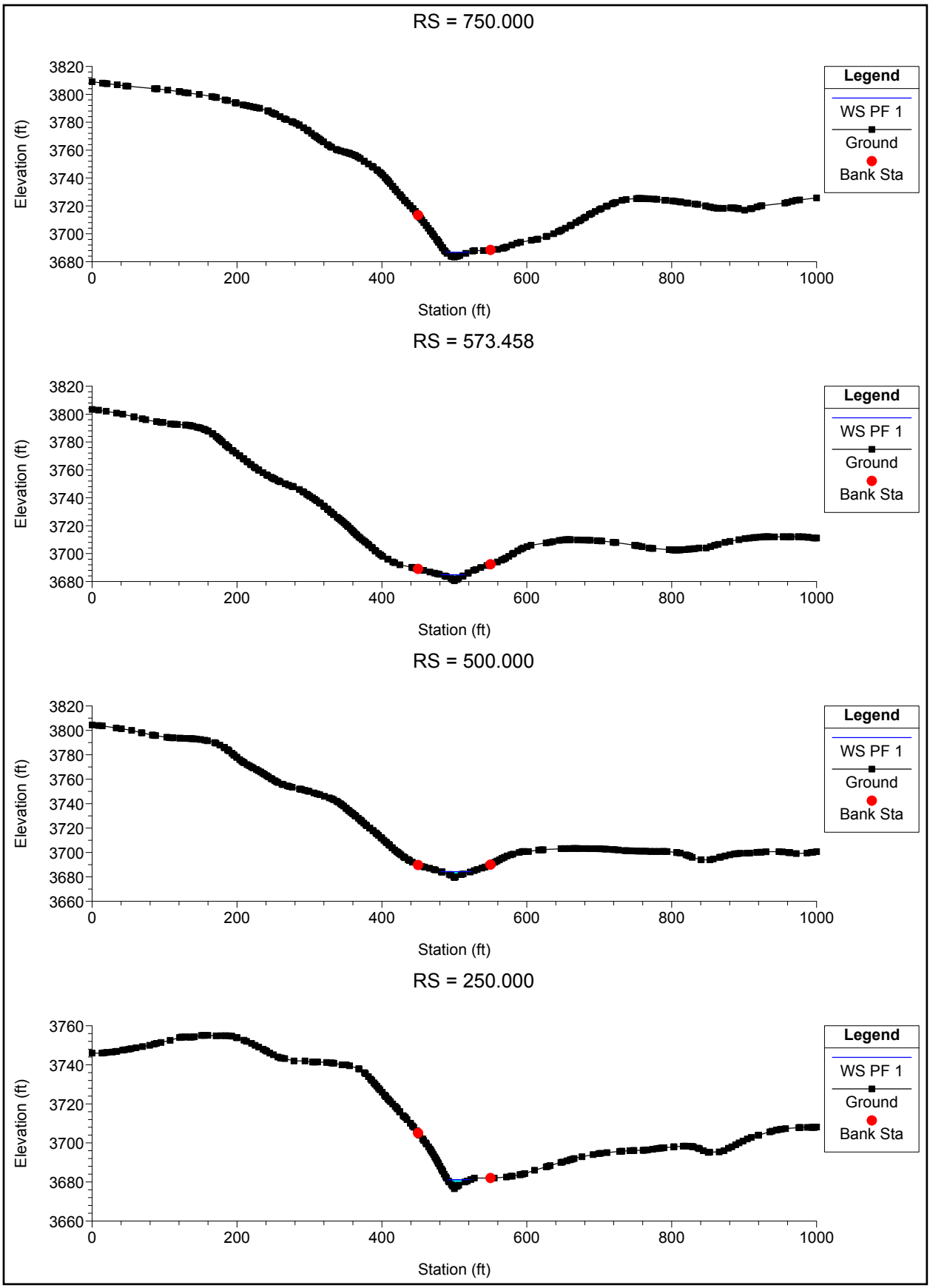
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 1500.000
Elevation (ft)
3780
3760
3740
3720
3700
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1250.000
Elevation (ft)
3740
3730
3720
3710
3700
3690
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 967.464
Elevation (ft)
3820
3800
3780
3760
3740
3720
3700
3680
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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Station (ft)
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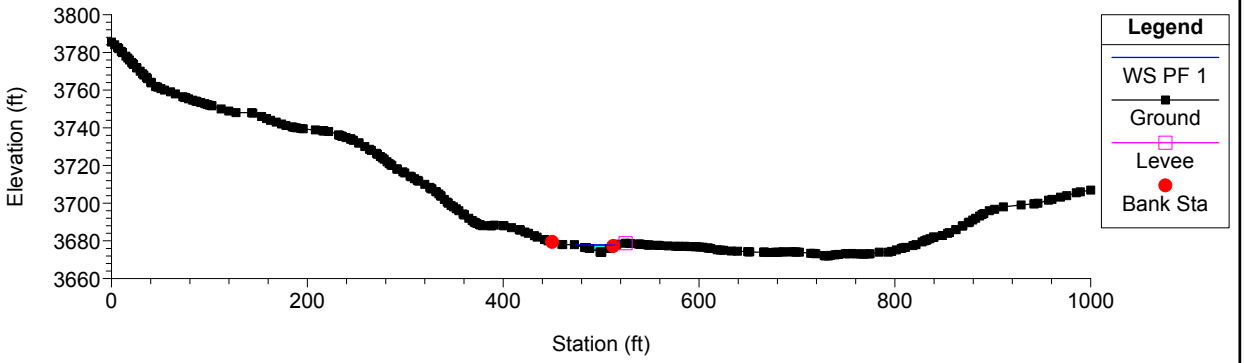
WS PF 1
Ground
Bank Sta
RS = 573.458
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 500.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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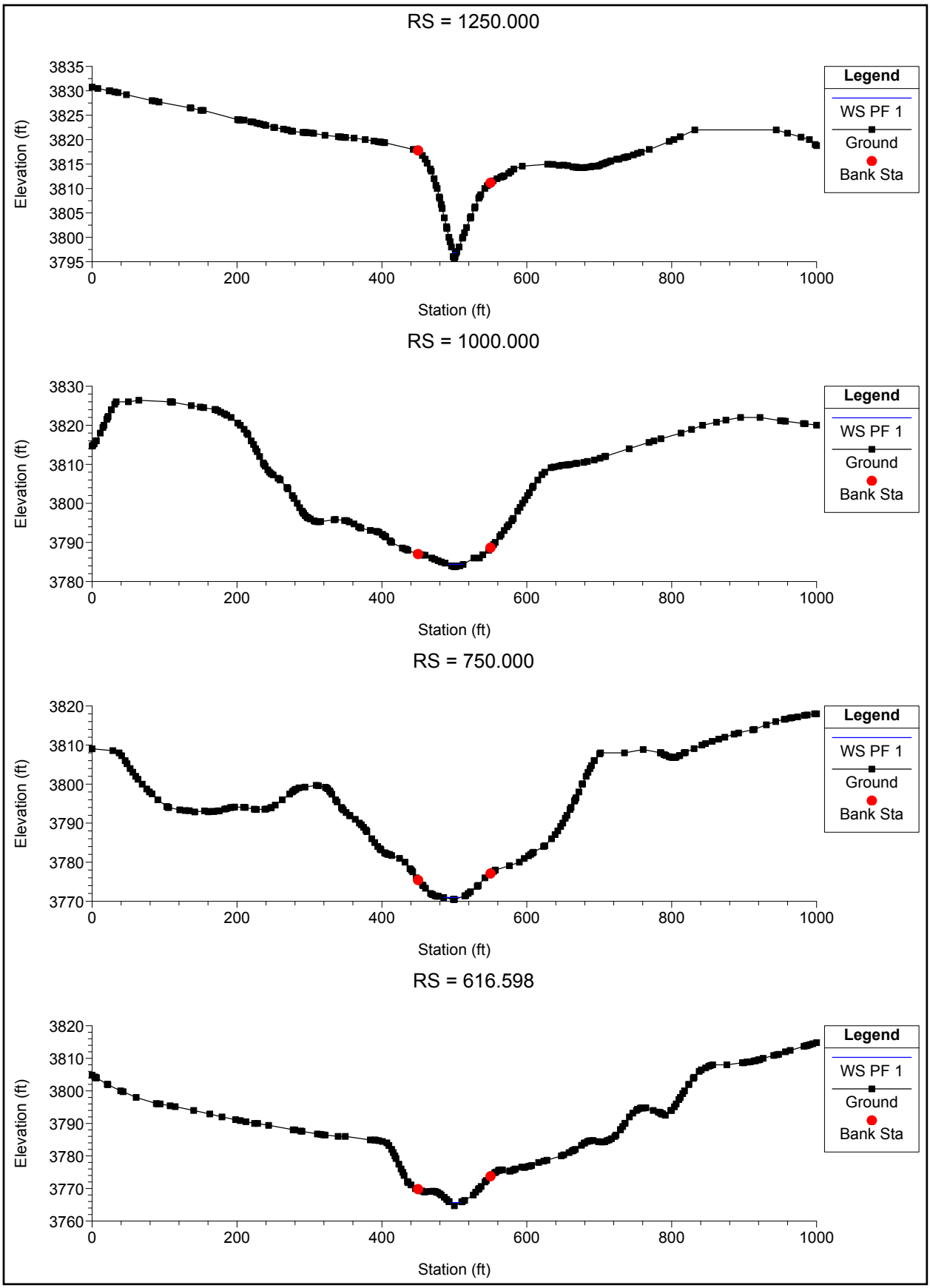
3800
3780
3760
3740
3720
3700
3680
3660
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta

# Attachment 2.7-M-29

# HEC-RAS Channel 16

| 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) | |
| 16 | 1250 | PF 1 | 30 | 3795.73 | 3796.84 | 3797.23 | 3798.06 | 0.092013 | 8.87 | 3.38 | 5.33 | 1.96 |
| 16 | 1000 | PF 1 | 30 | 3783.76 | 3784.38 | 3784.43 | 3784.63 | 0.035834 | 4.02 | 7.45 | 20.98 | 1.19 |
| 16 | 750 | PF 1 | 30 | 3770.48 | 3770.96 | 3771.1 | 3771.41 | 0.100246 | 5.36 | 5.59 | 22.18 | 1.88 |
| 16 | 616.598 | PF 1 | 30 | 3764.7 | 3765.66 | 3765.71 | 3765.98 | 0.030673 | 4.52 | 6.63 | 13.83 | 1.15 |
| 16 | 500 | PF 1 | 30 | 3761.3 | 3761.94 | 3762.02 | 3762.24 | 0.046039 | 4.33 | 6.93 | 21.13 | 1.33 |
| 16 | 250 | PF 1 | 30 | 3751.96 | 3753.65 | 3753.68 | 3754.12 | 0.024863 | 5.46 | 5.5 | 6.64 | 1.06 |
| 16 | 0 | PF 1 | 30 | 3746 | 3747.44 | 3747.31 | 3747.67 | 0.013009 | 3.8 | 7.89 | 10.93 | 0.79 |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200
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1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3830
3820
3810
3800
3790
3780
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
3820
3810
3800
3790
3780
3770
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 616.598
Elevation (ft)
3820
3810
3800
3790
3780
3770
3760
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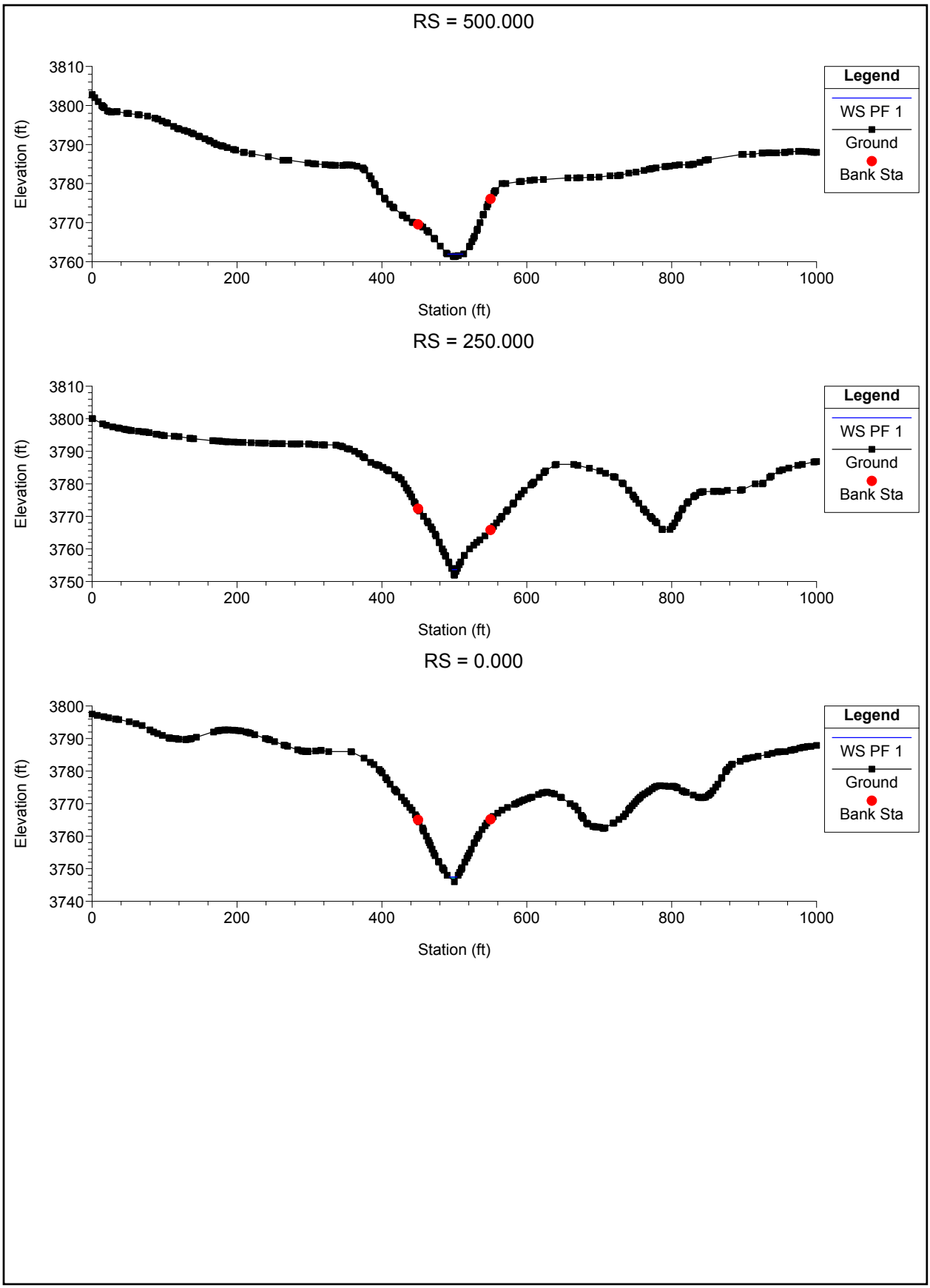
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta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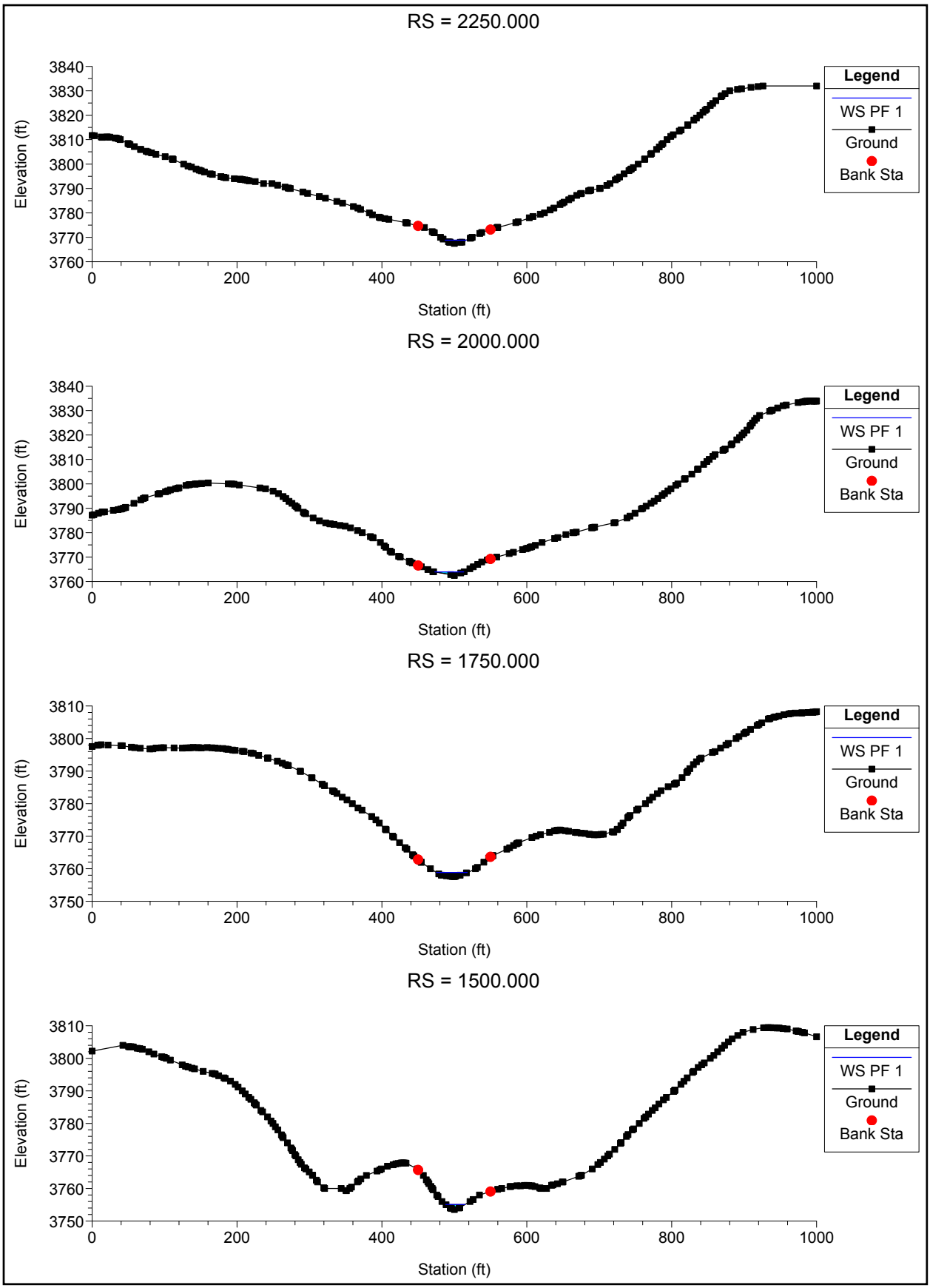
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3810
3800
3790
3780
3770
3760
3750
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 0.000
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

# Attachment 2.7-M-30

# HEC-RAS Channel 17

| 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) | |
| 17 | 2250 | PF 1 | 133 | 3767.49 | 3768.84 | 3768.91 | 3769.34 | 0.024033 | 5.68 | 23.42 | 29.08 | 1.11 |
| 17 | 2000 | PF 1 | 133 | 3762.49 | 3763.92 | 3763.92 | 3764.28 | 0.020727 | 4.79 | 27.74 | 39.82 | 1.01 |
| 17 | 1750 | PF 1 | 133 | 3757.56 | 3758.84 | 3758.67 | 3759.07 | 0.010953 | 3.86 | 34.45 | 42.44 | 0.75 |
| 17 | 1500 | PF 1 | 133 | 3753.54 | 3755.1 | 3755.1 | 3755.57 | 0.019095 | 5.47 | 24.3 | 26.75 | 1.01 |
| 17 | 1250 | PF 1 | 133 | 3747.37 | 3749.05 | 3749.18 | 3749.62 | 0.031642 | 6.04 | 22.03 | 30.6 | 1.25 |
| 17 | 1000 | PF 1 | 133 | 3743.91 | 3745.17 | 3745.13 | 3745.46 | 0.017706 | 4.32 | 30.75 | 45.84 | 0.93 |
| 17 | 750 | PF 1 | 133 | 3739.14 | 3740.73 | 3740.73 | 3741.13 | 0.019475 | 5.07 | 26.22 | 32.94 | 1 |
| 17 | 636.176 | PF 1 | 133 | 3735.7 | 3736.87 | 3737.14 | 3737.69 | 0.052677 | 7.27 | 18.29 | 28.25 | 1.59 |
| 17 | 500 | PF 1 | 133 | 3731.86 | 3734.17 | 3734.17 | 3734.72 | 0.018403 | 5.93 | 22.43 | 20.93 | 1.01 |
| 17 | 250 | PF 1 | 133 | 3727.63 | 3729.02 | 3729.08 | 3729.48 | 0.025155 | 5.43 | 24.51 | 33.68 | 1.12 |
| 17 | 0 | PF 1 | 133 | 3722 | 3723.66 | 3723.68 | 3724.17 | 0.020047 | 5.73 | 23.19 | 24.63 | 1.04 |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3810
3800
3790
3780
3770
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 2000.000
Elevation (ft)
3840
3830
3820
3810
3800
3790
3780
3770
3760
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1750.000
Elevation (ft)
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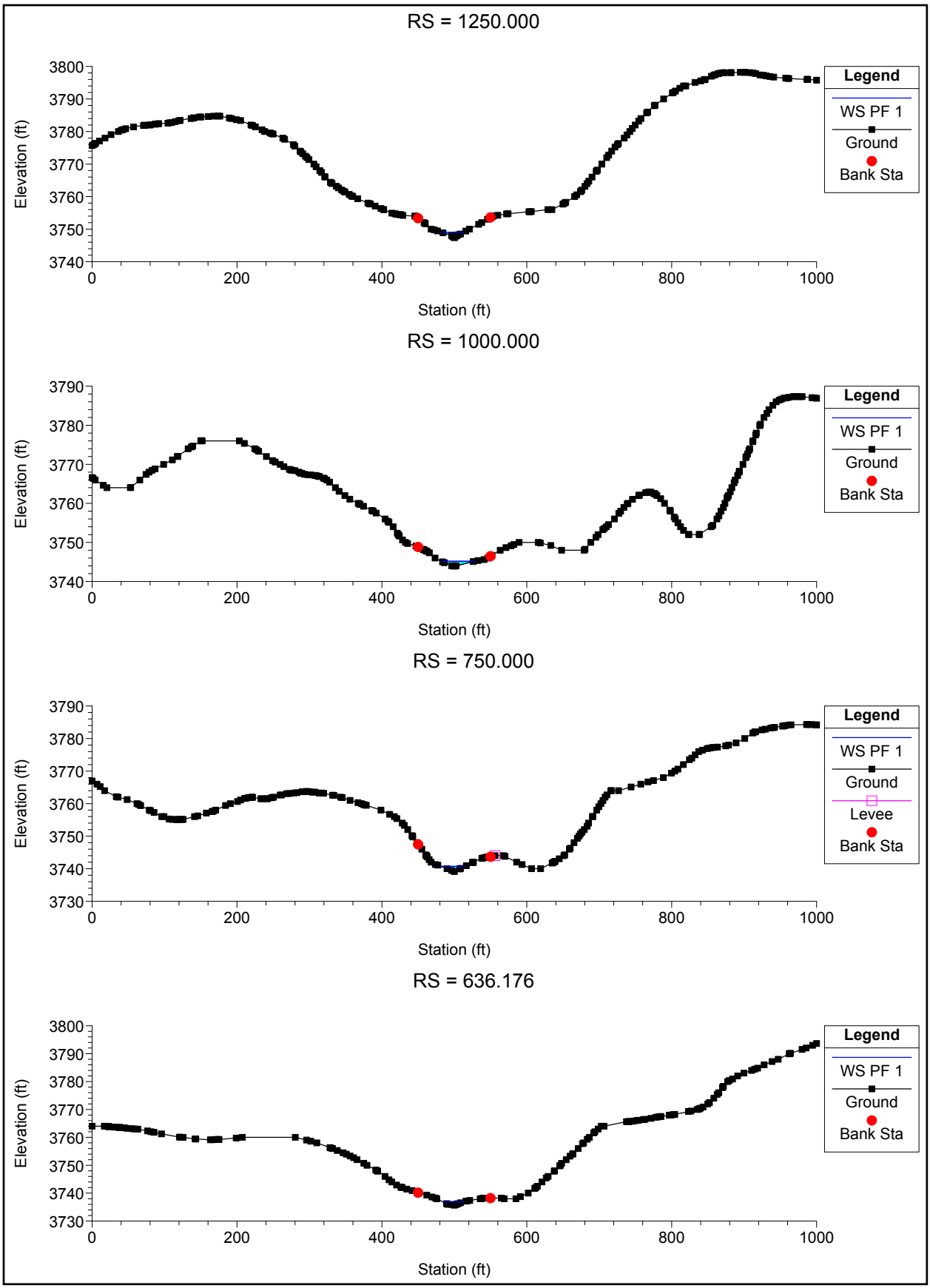
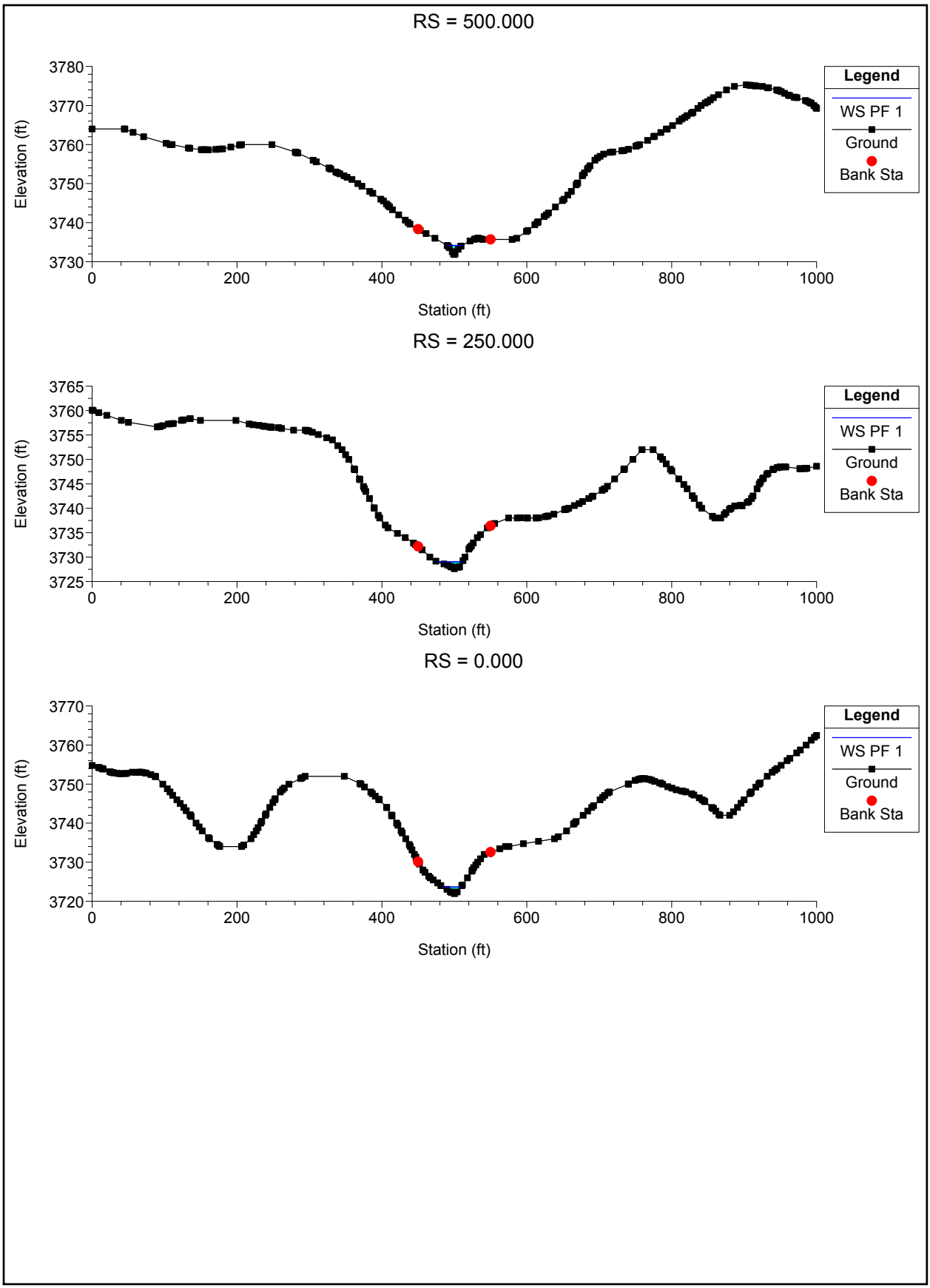
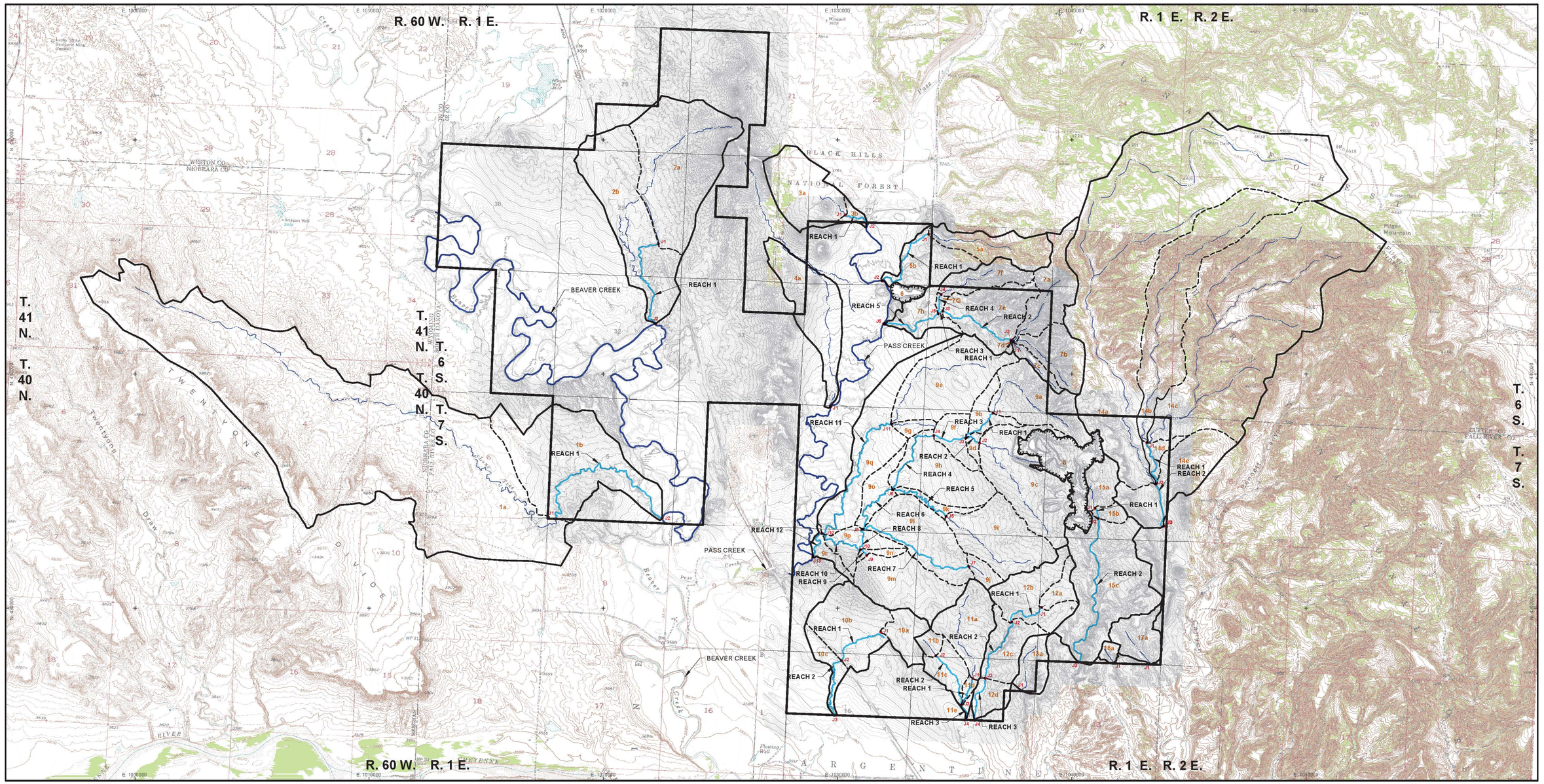
3800
3790
3780
3770
3760
3750
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1500.000
Elevation (ft)
3810
3800
3790
3780
3770
3760
3750
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 1250.000
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 1000.000
Elevation (ft)
3790
3780
3770
3760
3750
3740
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 750.000
Elevation (ft)
3790
3780
3770
3760
3750
3740
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Levee
Bank Sta
RS = 636.176
Elevation (ft)
3800
3790
3780
3770
3760
3750
3740
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


RS = 500.000
Elevation (ft)
3780
3770
3760
3750
3740
3730
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 250.000
Elevation (ft)
3765
3760
3755
3750
3745
3740
3735
3730
3725
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
RS = 0.000
Elevation (ft)
3770
3760
3750
3740
3730
3720
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta




Feet
0 1,000 2,000 4,000 6,000 8,000
0 500 1,000 2,000
Meters

## LEGEND

- PERMIT BOUNDARY
- PRIMARY DRAINAGE BASIN
- SECONDARY DRAINAGE BASIN
- CLOSED DRAINAGE BASIN
- PREVIOUSLY ANALYZED CHANNEL
- EPHEMERAL STREAM CHANNEL
- HEC-HMS REACH
- 15C HEC-HMS SUB BASIN IDENTIFIER
- J1 HEC-HMS JUNCTION LOCATION AND NUMBER

N

CONSULTANT

REF

CHECK SCALES
If this bar does not measure 1 inch this map is not at its original scale

REVISIONS

| # | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| | | | | |

PLOT DATE 24 June 2011 | DATE 24-June-2011
DRAWN DCJ | PDF FILE | COORD NAD 27, South Dakota State Plane South (feet)
CHECKED DEB | CAD FILE K:\Powertech\11108\DWG\SWATERSHED.dwg

POWERTECH (USA) INC.

# EXHIBIT 2.7-M-1

## Drainage Basins

Dewey-Burdock Project

R. 60 W. R. 1 E. R. 1 E. R. 2 E.

T. 41 N.
T. 40 N.
T. 6 S.
T. 7 S.

HEC-RAS CHANNEL 02A
HEC-RAS CHANNEL 02B
HEC-RAS CHANNEL 02
HEC-RAS CHANNEL 01
HEC-RAS CHANNEL 03
HEC-RAS CHANNEL 04
HEC-RAS CHANNEL 05
HEC-RAS CHANNEL 07A
HEC-RAS CHANNEL 07
HEC-RAS CHANNEL 07B
HEC-RAS CHANNEL 07C
HEC-RAS CHANNEL 09A
HEC-RAS CHANNEL 09B
HEC-RAS CHANNEL 09C
HEC-RAS CHANNEL 09D
HEC-RAS CHANNEL 09E
HEC-RAS CHANNEL 09F
HEC-RAS CHANNEL 09
HEC-RAS CHANNEL 10
HEC-RAS CHANNEL 11
HEC-RAS CHANNEL 11A
HEC-RAS CHANNEL 12
HEC-RAS CHANNEL 13
HEC-RAS CHANNEL 14
HEC-RAS CHANNEL 14A
HEC-RAS CHANNEL 14B
HEC-RAS CHANNEL 15
HEC-RAS CHANNEL 16
HEC-RAS CHANNEL 17

BEAVER CREEK
PASS CREEK
BEAVER CREEK
PASS CREEK

E. 1020000 E. 1030000 E. 1040000

## LOCATION MAP

SCALE: 1" = 1000'
C.I. = 2'

Feet: 0 500 1,000 2,000 3,000 4,000
Meters: 0 250 500 1,000

## LEGEND

PERMIT BOUNDARY
100-YEAR INUNDATION BOUNDARY

N

CONSULTANT

REVISIONS

| # | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| | | | | |

REF

CHECK SCALES
If this bar does not measure 1 inch this map is not at its original scale

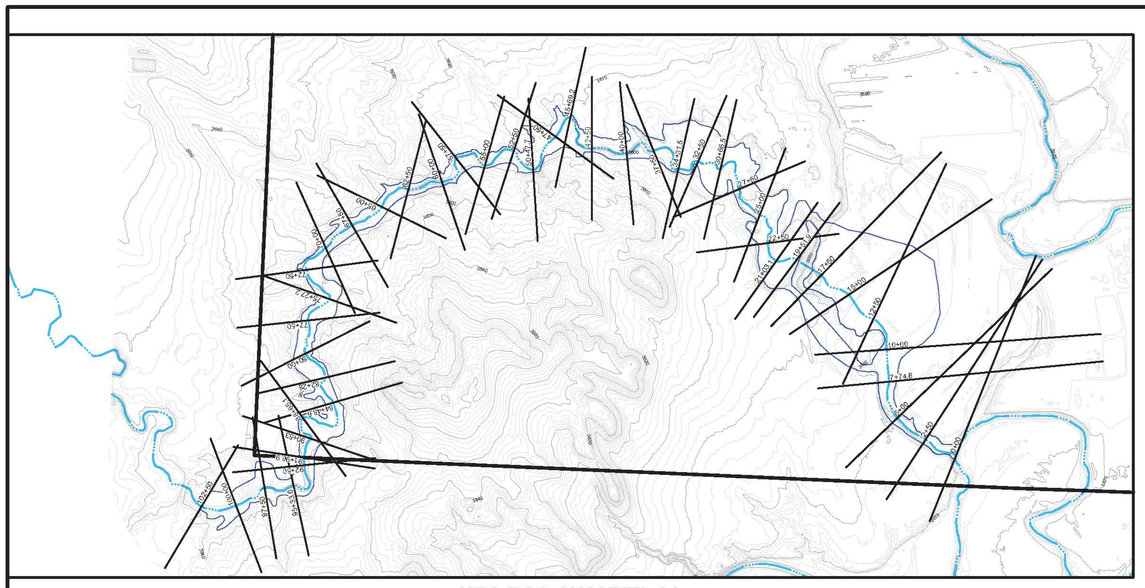
PLOT DATE 24 June 2011
DATE 16-June-2011
DRAWN DCJ
PDF FILE
CHECKED DEB
COORDS NAD 27, South Dakota State Plane South (feet)
CAD FILE K:\Powertech\11108\DWGS\HEC_RAS.dwg

POWERTECH (USA) INC.

# Exhibit 2.7-M-2

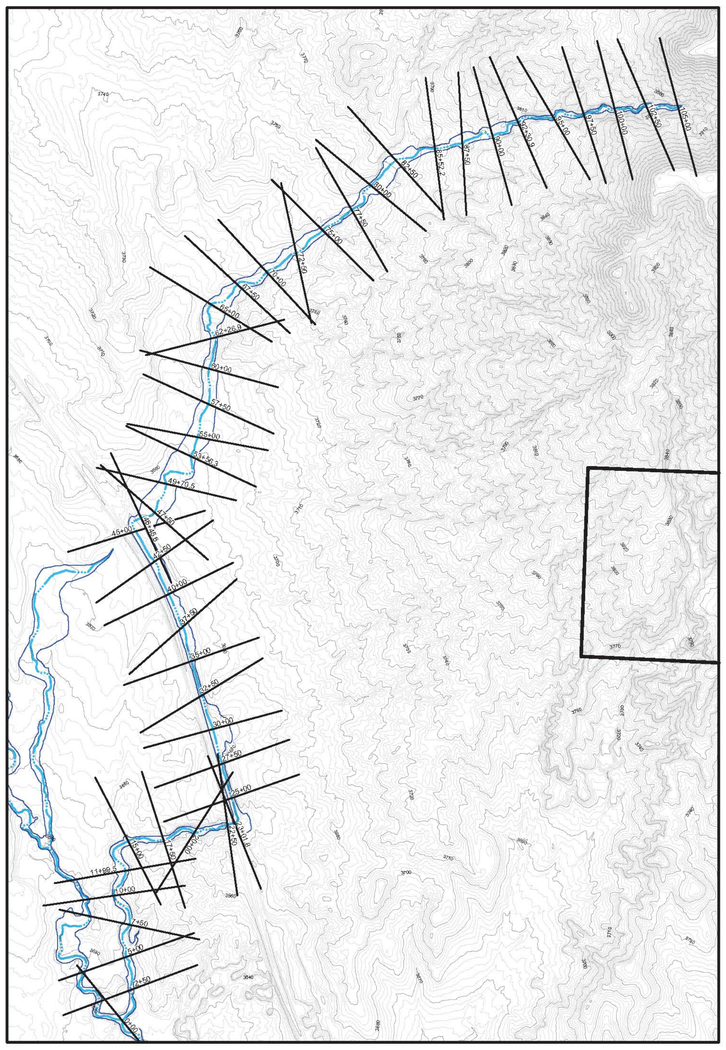
## HEC-RAS Location And 100-year Inundation Map

Dewey-Burdock Project



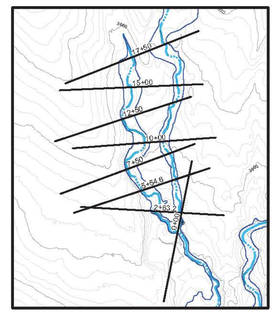
## HEC-RAS CHANNEL 01

SCALE: 1" = 500'
C.I. = 2'



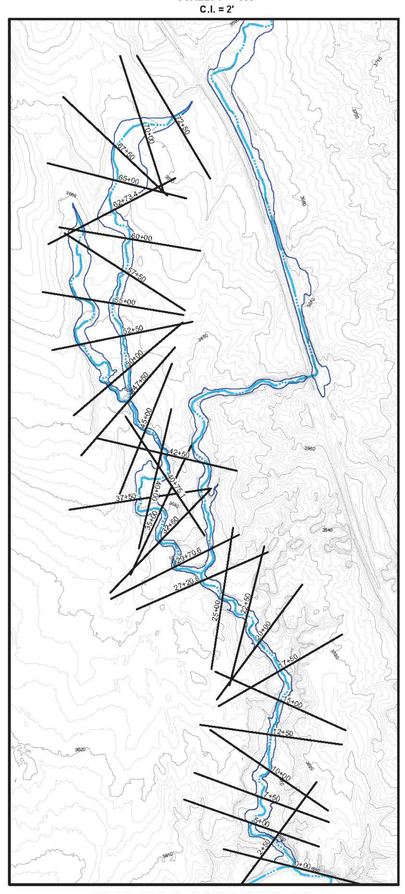
## HEC-RAS CHANNEL 02A

SCALE: 1" = 500'
C.I. = 2'



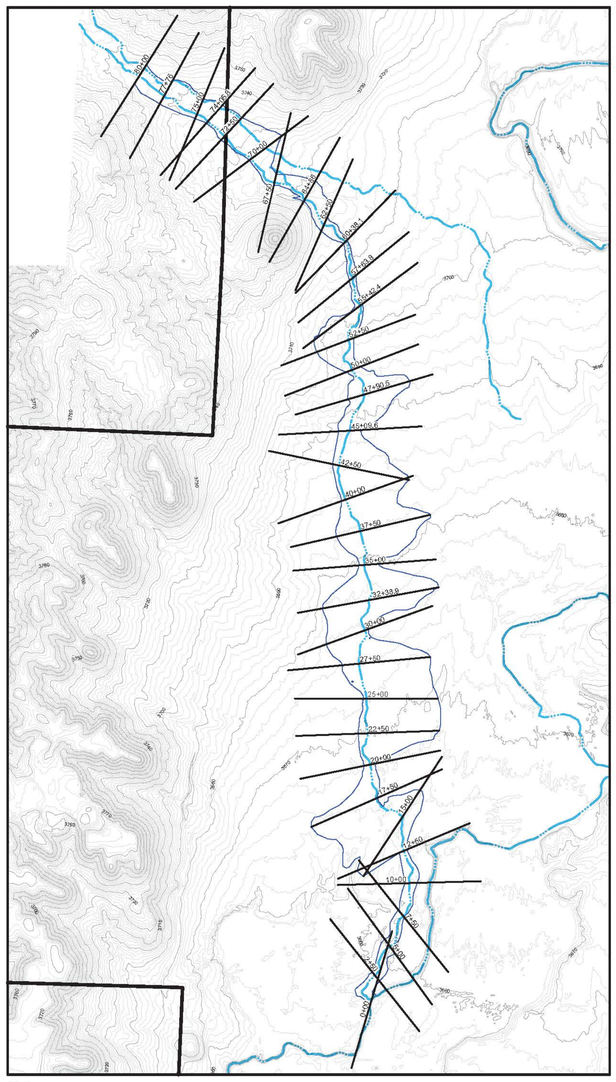
## HEC-RAS CHANNEL 02B

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 02

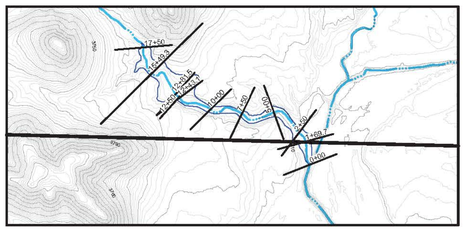
SCALE: 1" = 500'
C.I. = 2'



NOTE:
BELOW STATION 50+00 THERE IS NO WELL DEFINED CHANNEL. THEREFORE THE FLOW WILL SPREAD OUT AND BE OVERLAND FLOW.

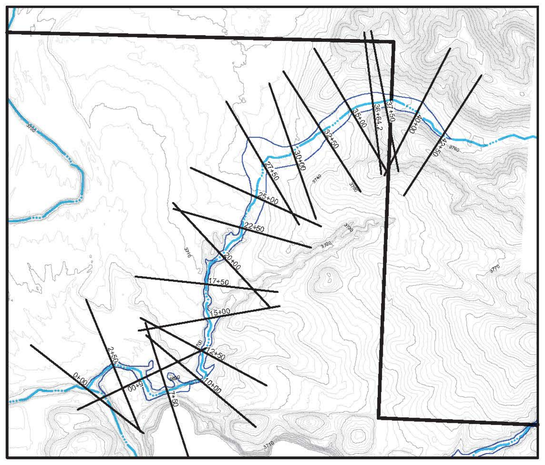
## HEC-RAS CHANNEL 04

SCALE: 1" = 500'
C.I. = 2'



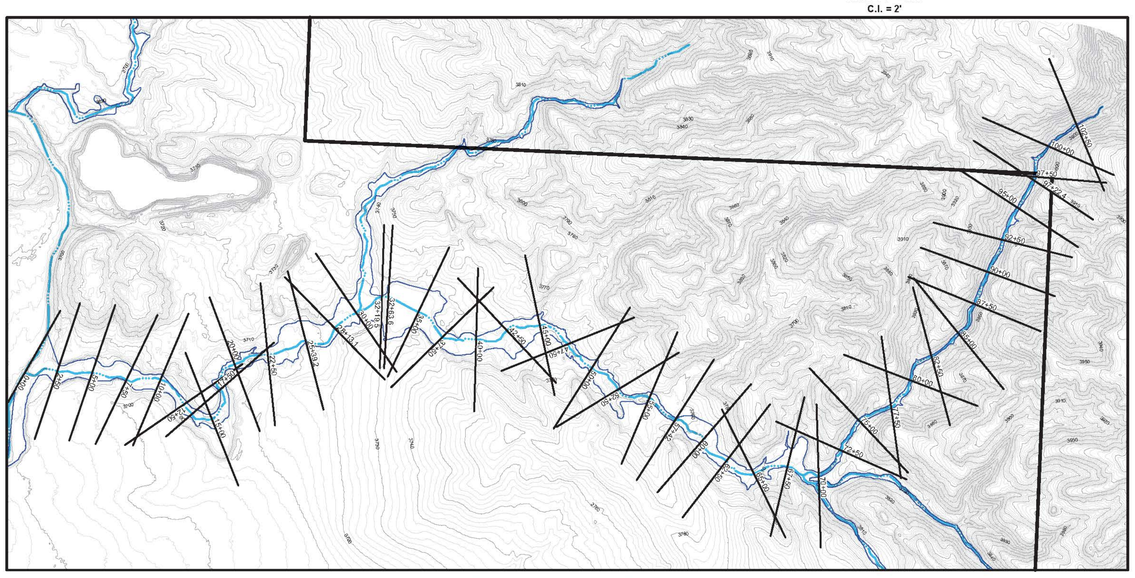
## HEC-RAS CHANNEL 03

SCALE: 1" = 500'
C.I. = 2'



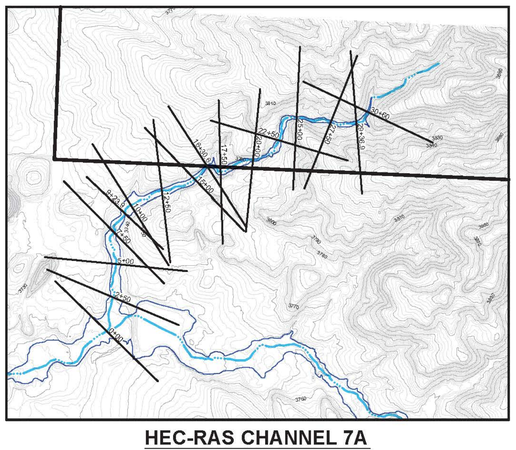
## HEC-RAS CHANNEL 05

SCALE: 1" = 500'
C.I. = 2'



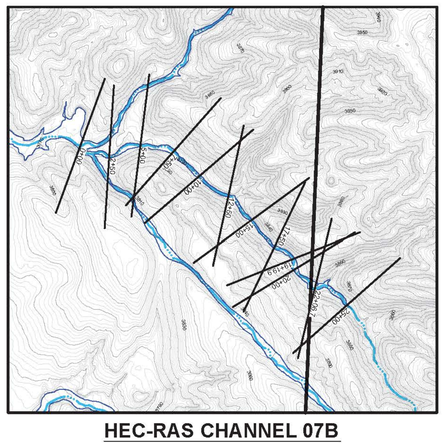
## HEC-RAS CHANNEL 07

SCALE: 1" = 500'
C.I. = 2'



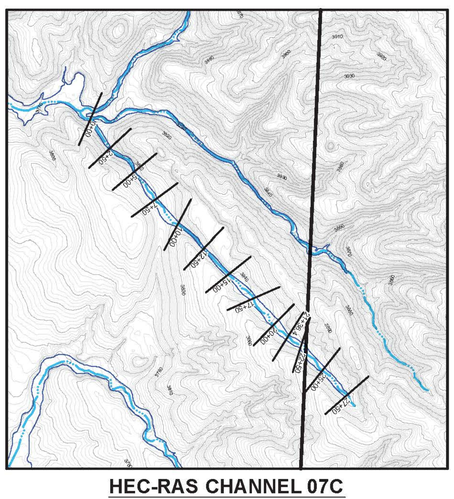
## HEC-RAS CHANNEL 7A

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 07B

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 07C

SCALE: 1" = 500'
C.I. = 2'

## LEGEND

PERMIT BOUNDARY

100-YEAR INUNDATION BOUNDARY

NOTE:
THERE IS NO HEC-RAS ANALYSIS FOR CHANNEL 06 OR CHANNEL 08. THEY ARE CLOSED BASINS.

Feet
0 250 500 1,000 1,500 2,000
0 125 250 500
Meters

N

SHEET 1 OF 3

CONSULTANT

REVISIONS

| # | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| | | | | |

REF

CHECK SCALES
If this bar does not measure 1 inch this map is not at its original scale.

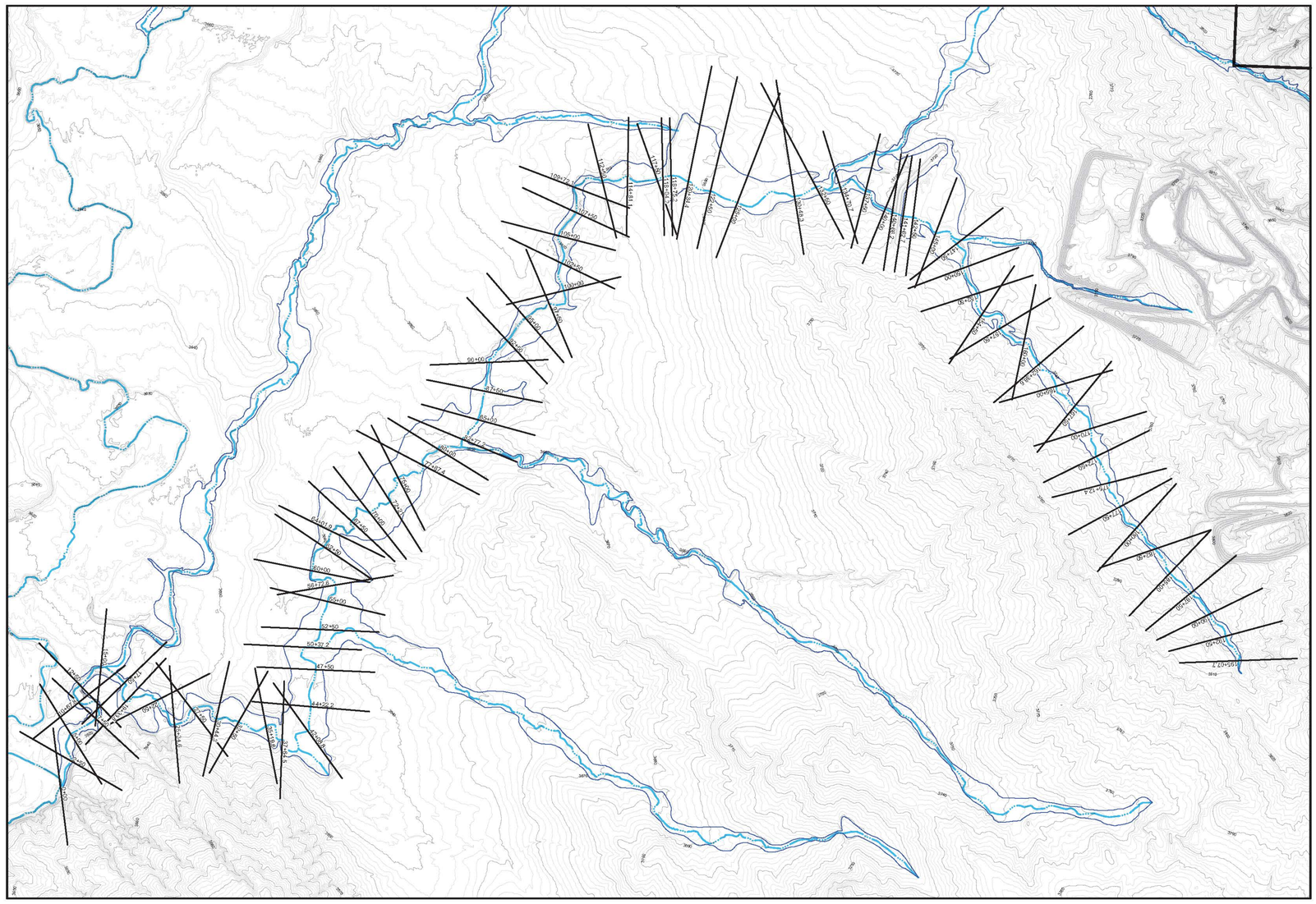
Powertech (USA) Inc.

# EXHIBIT 2.7-M-3

## HEC-RAS CROSS SECTIONS

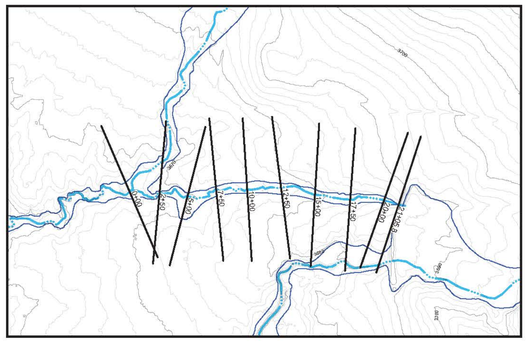
Dewey-Burdock Project

| | | | |
|---|---|---|---|
| PLOT DATE 24 June 2011 | DATE 16-June-2011 | | |
| DRAWN DCJ | PDF FILE | COORD'S NAD 27, South Dakota State Plane South (feet) | |
| CHECKED DEB | CAD FILE K:\Powertech\11108\DWGS\HEC_RAS.dwg | | |



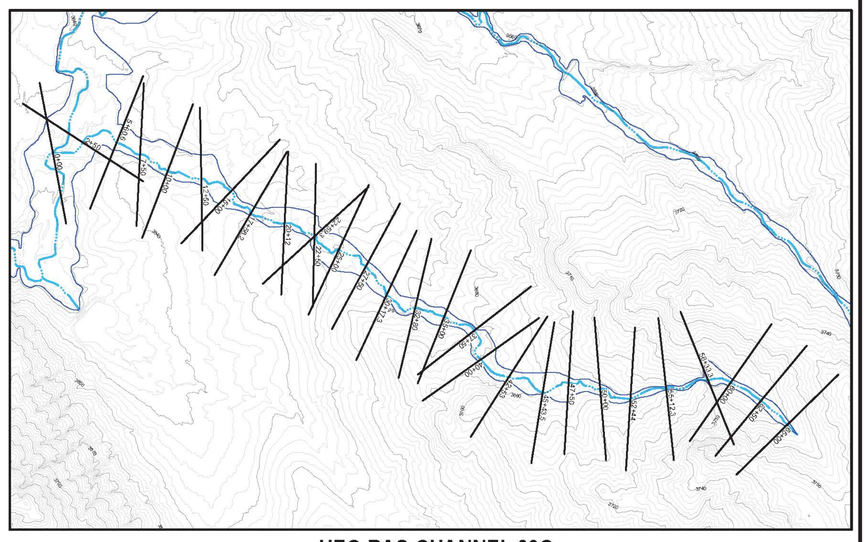
## HEC-RAS CHANNEL 09

SCALE: 1" = 500'
C.I. = 2'



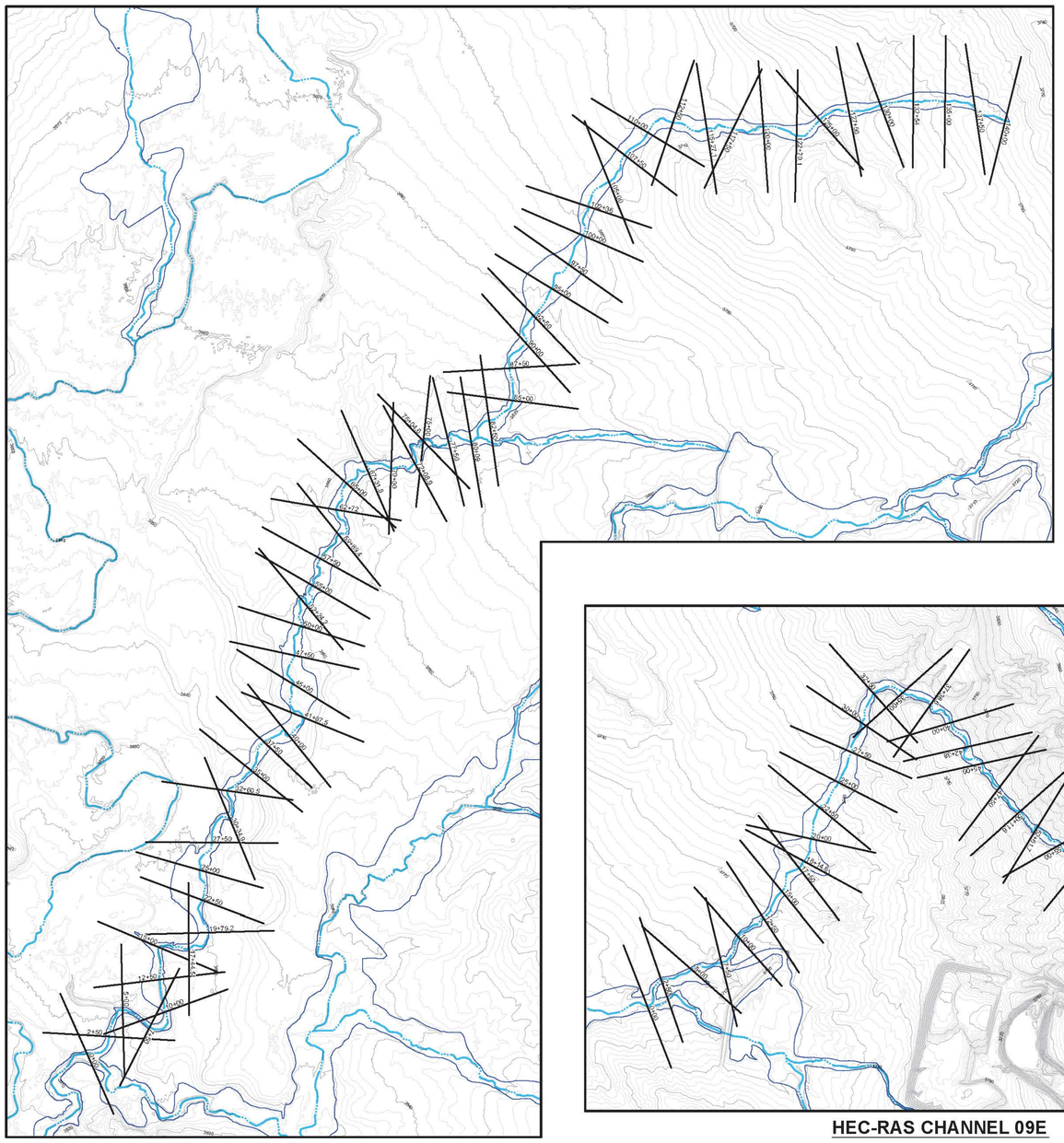
## HEC-RAS CHANNEL 09B

SCALE: 1" = 500'
C.I. = 2'



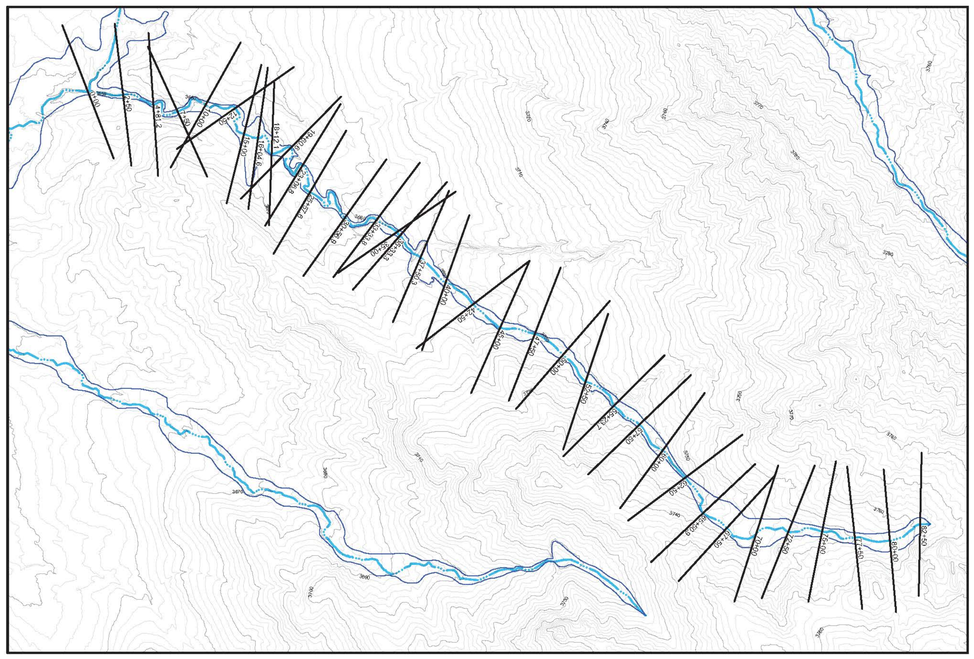
## HEC-RAS CHANNEL 09C

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 09A

SCALE: 1" = 500'
C.I. = 2'

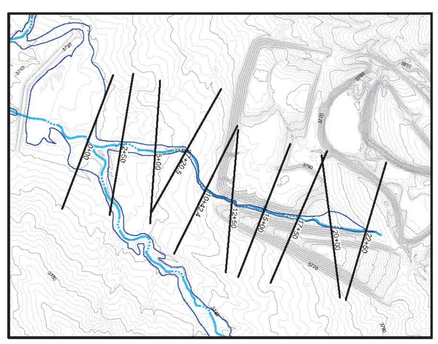


## HEC-RAS CHANNEL 09D

SCALE: 1" = 500'
C.I. = 2'

## HEC-RAS CHANNEL 09E

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 09F

SCALE: 1" = 500'
C.I. = 2'

## LEGEND

PERMIT BOUNDARY

100-YEAR INUNDATION BOUNDARY

N

Feet
0 250 500 1,000 1,500 2,000
0 125 250 500
Meters

SHEET 2 OF 3

CONSULTANT

REF

CHECK SCALES
If this bar does not measure 1 inch this map is not at its original scale

REVISIONS

| # | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| | | | | |

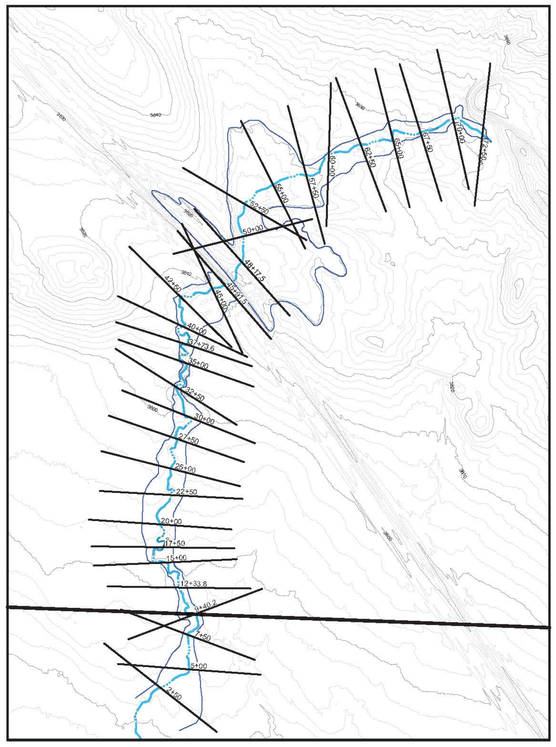
PLOT DATE: 24 June 2011
DRAWN: DCJ
CHECKED: DEB
DATE: 16-June-2011
PDF FILE:
CAD FILE: K:\Powertech\11108\DWGS\HEC_RAS.dwg
COORD: NAD 27, South Dakota State Plane South (feet)

Powertech (USA) Inc.

# EXHIBIT 2.7-M-3

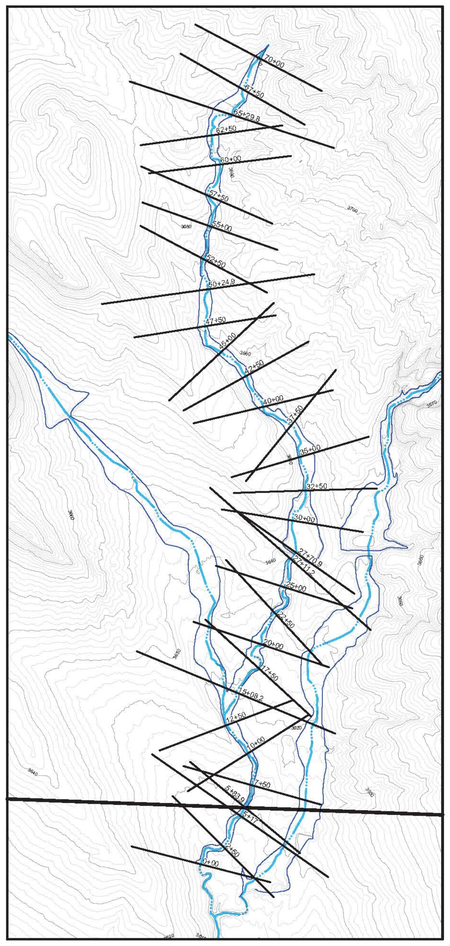
## HEC-RAS CROSS SECTIONS

Dewey-Burdock Project



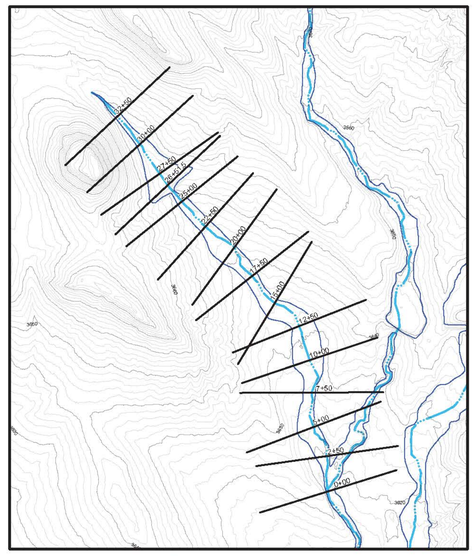
## HEC-RAS CHANNEL 10

SCALE: 1" = 500'
C.I. = 2'



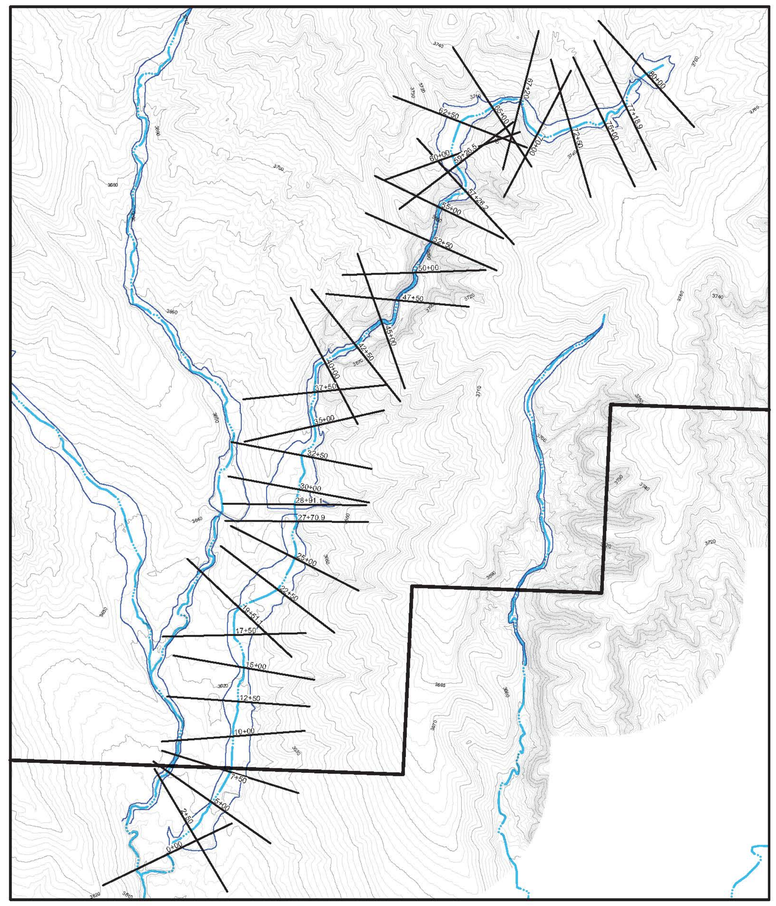
## HEC-RAS CHANNEL 11

SCALE: 1" = 500'
C.I. = 2'



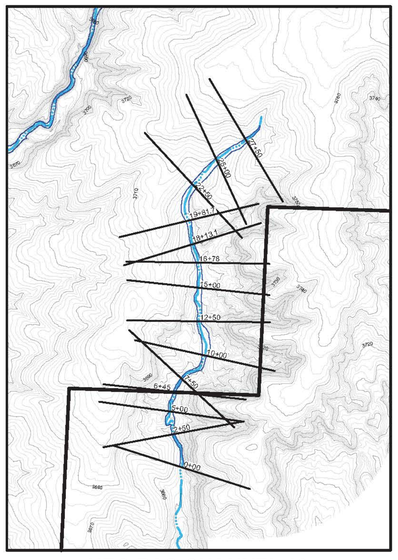
## HEC-RAS CHANNEL 11A

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 12

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 13

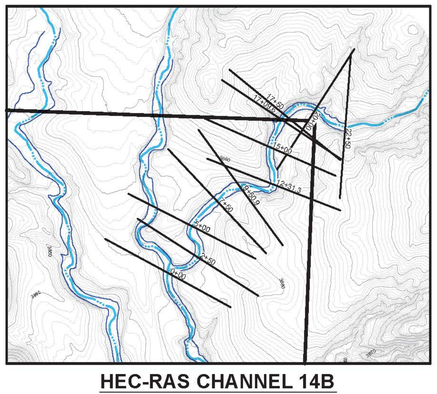
SCALE: 1" = 500'
C.I. = 2'

## HEC-RAS CHANNEL 14

SCALE: 1" = 500'
C.I. = 2'

## HEC-RAS CHANNEL 14A

SCALE: 1" = 500'
C.I. = 2'

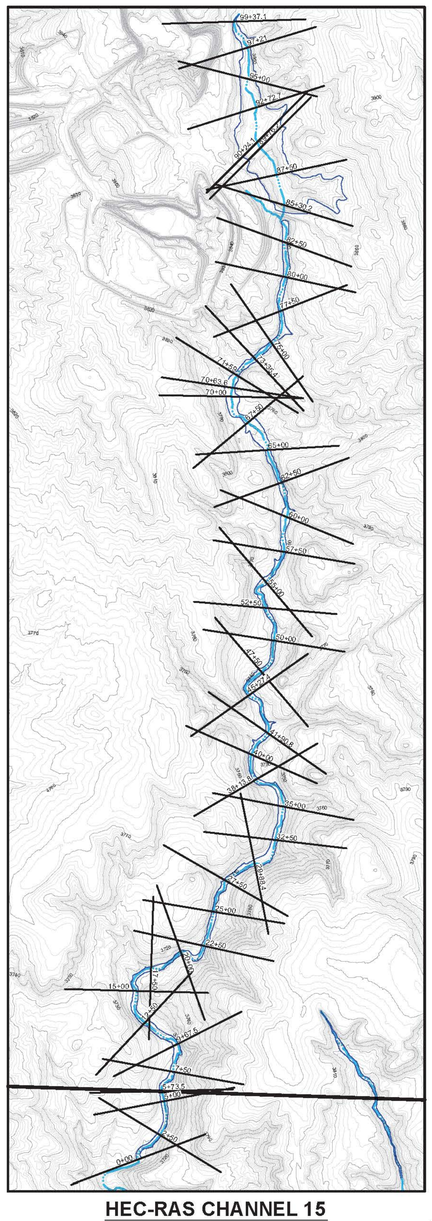


## HEC-RAS CHANNEL 14B

SCALE: 1" = 500'
C.I. = 2'

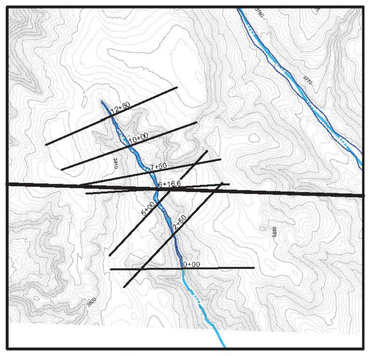
## HEC-RAS CHANNEL 17

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 15

SCALE: 1" = 500'
C.I. = 2'



## HEC-RAS CHANNEL 16

SCALE: 1" = 500'
C.I. = 2'

## LEGEND

PERMIT BOUNDARY
100-YEAR INUNDATION BOUNDARY

N

Feet
0 250 500 1,000 1,500 2,000
0 125 250 500
Meters

SHEET 3 OF 3

CONSULTANT

REVISIONS

| # | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| | | | | |

REF

CHECK SCALES
If this bar does not measure 1 inch this map is not at its original scale

PLOT DATE: 24 June 2011
DRAWN: DCJ
CHECKED: DEB
DATE: 16-June-2011
PDF FILE:
CAD FILE: K:\Powertech\1110B\DWGS\HEC_RAS.dwg
COORDS: NAD 27, South Dakota State Plane South (feet)

Powertech (USA) Inc.

# EXHIBIT 2.7-M-3

## HEC-RAS CROSS SECTIONS

Dewey-Burdock Project