GLW
PLANNING | ENGINEERING | SURVEYING

MEADOWBROOK STABLES

ALTERATION OF THE FLOODPLAIN COMPUTATIONS AND REPORT

MARYLAND DEPARTMENT OF THE ENVIRONMENT

PREPARED FOR:

MEADOWBROOK FOUNDATION, INC.
8200 MEADOWBROOK LANE
CHEVY CHASE, MD 20815

PROFESSIONAL CERTIFICATION:

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.: 17285, EXPIRATION DATE: MARCH 17, 2021

STATE OF MARYLAND
TODD MICHAEL REDDAN
No. 17285
PROFESSIONAL ENGINEER

for GLWPA
1.16.20

GLW JOB #: 98109
DATE: JANUARY 09, 2020

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Project Narrative

Meadowbrook Stables is located partially with in the floodplain of Rock Creek near the Montgomery County/District of Columbia boundary line. The location is downstream of the East-West Highway, MD-410, bridge. Meadowbrook Stables is located on property owned by MNCPPC-Montgomery County Parks, a bi-county agency, who is the applicant and as such is fee exempt per Wetlands and Waterways Program Application Fee Schedule and Guidelines.

The stable operation is proposing a covered riding pavilion in the South-East corner of the site. The pavilion that is proposed is a non-inhabitable structure used for horse riding events. It is designed to be a flood tolerable structure. The sides of the arena will be open most of the time, to allow for passage of floodwaters without interference. If they are closed, they will be opened in the event of a flood.

There are two studies depicting the 100-year floodplain for Rock Creek, FEMA and the "Rock Creek Stormwater and Water Quality Management Study" (Rock Creek Study) completed in 1977. Both studies route a discharge of (+/-) 14,000 CFS. Both studies reflect approximately the same floodplain elevation at the Meadowbrook Stables site.

The county is recognizing the Rock Creek study as the established 100-year floodplain for this area.

The purpose of this analysis is to analyze the effects of the grading in the Meadowbrook Stables site on the elevation of the floodplain. The grading consists of both cut and fill.

To perform this analysis, the HEC-2 model for the Rock Creek Study was obtained from Park and Planning and used as a base for a new HEC-RAS analysis containing the grading. Three HEC-RAS analyses were performed:

1. The input data from the original study was re-run through the HEC-RAS model.

2. Several cross sections were inserted in the original study across the Meadowbrook Stables site to more accurately model the floodplain in this area. An existing channel condition model was run with the new sections inserted.

3. A proposed channel condition model was run with the same cross sections reflecting the proposed grading conditions.

Refer to the table later in the study for comparative results of all three analyses.

The results of the current re-run of the Rock Creek Study HEC-2 (item no. 1 above), were slightly higher than the water surface elevations in the results of the original Rock Creek Study by a maximum of 0.16 feet. The re-run utilized the identical input data from the original study, but was run through a HEC-RAS model, version 5.0 dated February 2016. By re-running the original study through HEC-RAS, a level of consistency could be achieved producing a conclusive comparative analysis.

To conclude the analysis, the results of the floodplain elevations for the existing channel conditions with the new sections inserted (item no. 2 above) was compared to the proposed channel conditions (item no. 3 above).

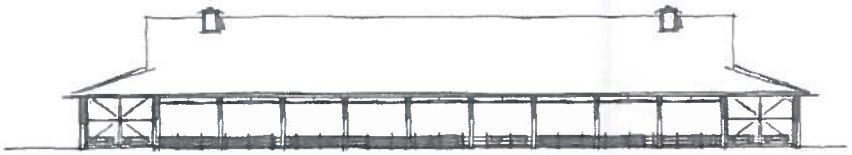
The results are that there is a maximum of a 0.01' increase in the 100-year floodplain elevations between the existing (item no. 2 above) and the proposed channel conditions (item no. 3 above). Therefore there will be no impact on the 100-year floodplain elevation of the Rock Creek floodplain.

Additionally, the FEMA Rock Creek floodplain has 2 cross sections that run through the proposed arena, Sections F and G. These sections show that the floodway for these sections have a width of 913' and 880' respectively. The proposed pavilion lies outside of the maximum extent of floodway, the site lies 1,020' from the east bank of Rock Creek along Section F and 932' along Section G.

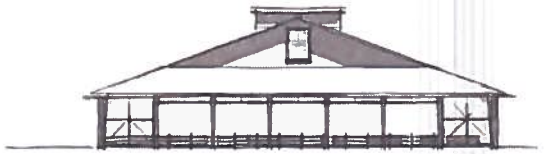
Construction of the covered riding arena and the associated grading in the floodplain is projected to be completed by December 2020. The construction process will follow the schedule on the sediment control plan.

100 Year Floodplain Analysis Summary Table

Original or Inserted Cross Section	Cross Section Number	Original HEC-2 Study (FT)	Item 1: Re-Run of Original HEC-2 Study in HEC-RAS (FT)	Item 2: Existing Conditions With New Sections in HEC-RAS (FT)	Item 3: Proposed Conditions With New Sections in HEC-RAS (FT)
Original	3645	182.42	182.42	182.42	182.42
Original	3687	182.47	182.47	182.47	182.47
Original	3702	182.52	182.53	182.53	182.53
Original	3745	182.56	182.57	182.57	182.57
Inserted	4500	-	-	183.41	183.40
Inserted	4720	-	-	183.75	183.75
Original	4850	183.88	183.99	183.93	183.94
Inserted	5055	-	-	184.19	184.19
Inserted	5255	-	-	184.48	184.48
Original	5690	184.83	184.98	185.06	185.06
Original	6180	185.38	185.54	185.60	185.60

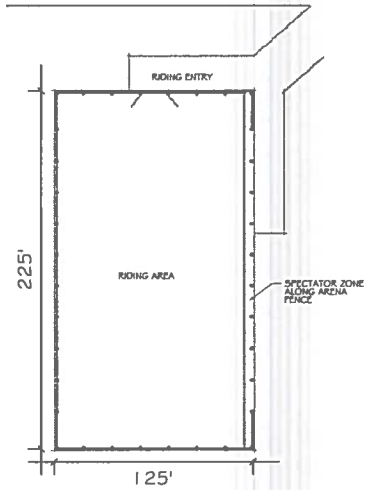


1 LONG ELEVATIONS (NORTH AND SOUTH)
1/16" = 1'



2 SIDE ELEVATIONS (EAST AND WEST)
1/16" = 1'

4 ARENA VIEWED FROM NORTHEAST



5 ARENA PLAN
1/32" = 1'

MICHE BOOZ ARCHITECT

PROFESSIONAL CERTIFICATION:

REFERENCE KEY NOTES:

SET: CONCEPTUAL PLAN

PROJECT:
Covered Riding Arena
Meadowbrook Stables
8200 Meadowbrook Lane, Chevy Chase, MD 20815

SHEET TITLE: ARCHITECTURAL DRAWINGS

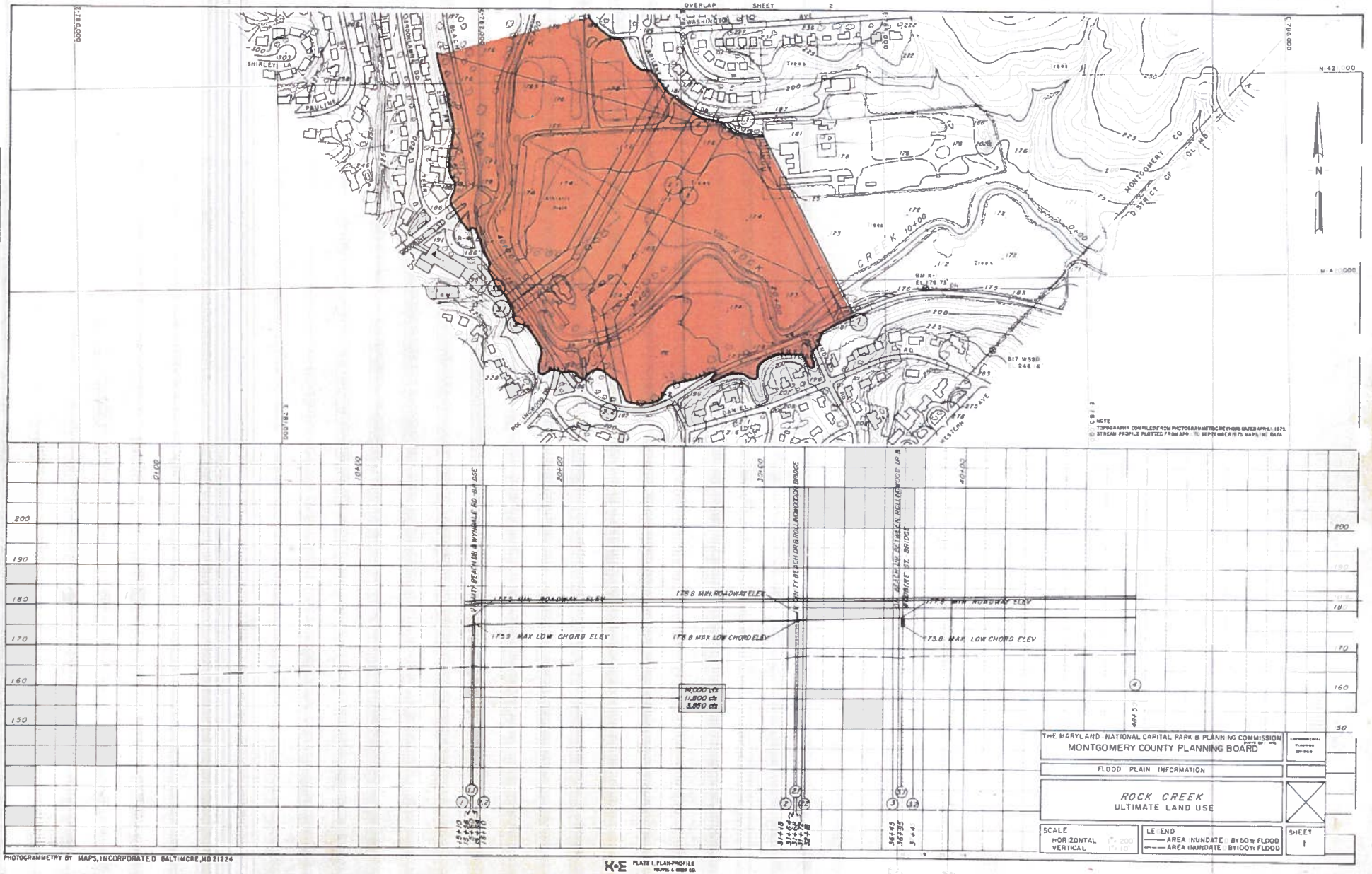
SCALE (FEET):

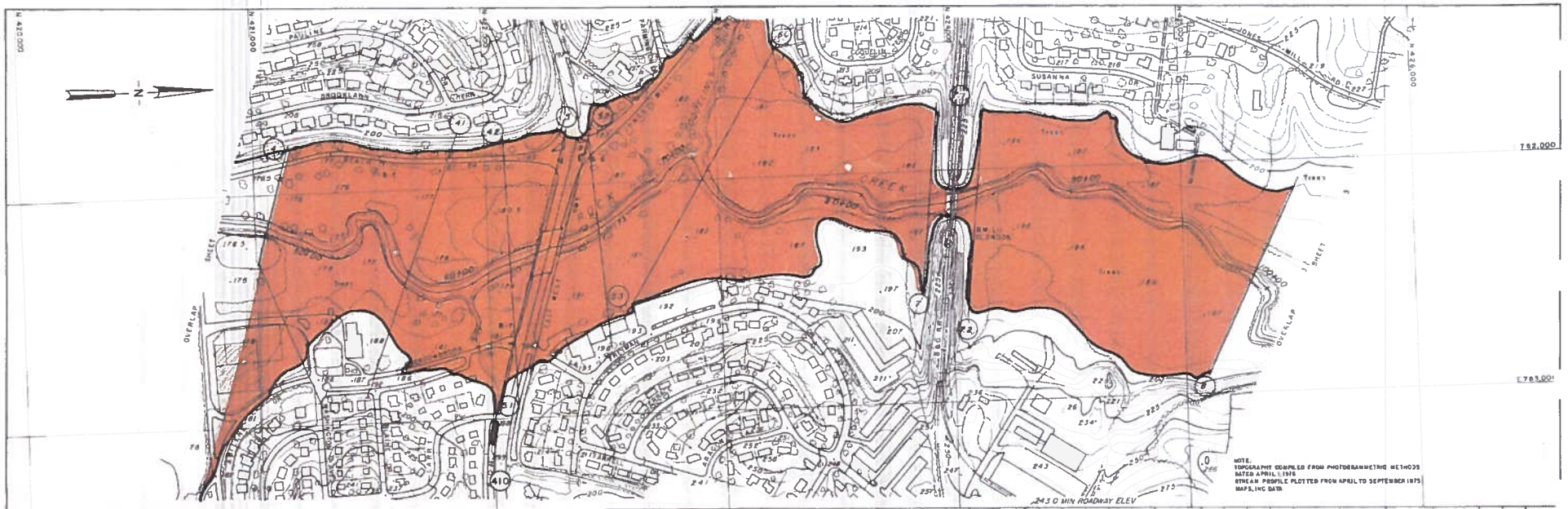
REVISIONS:

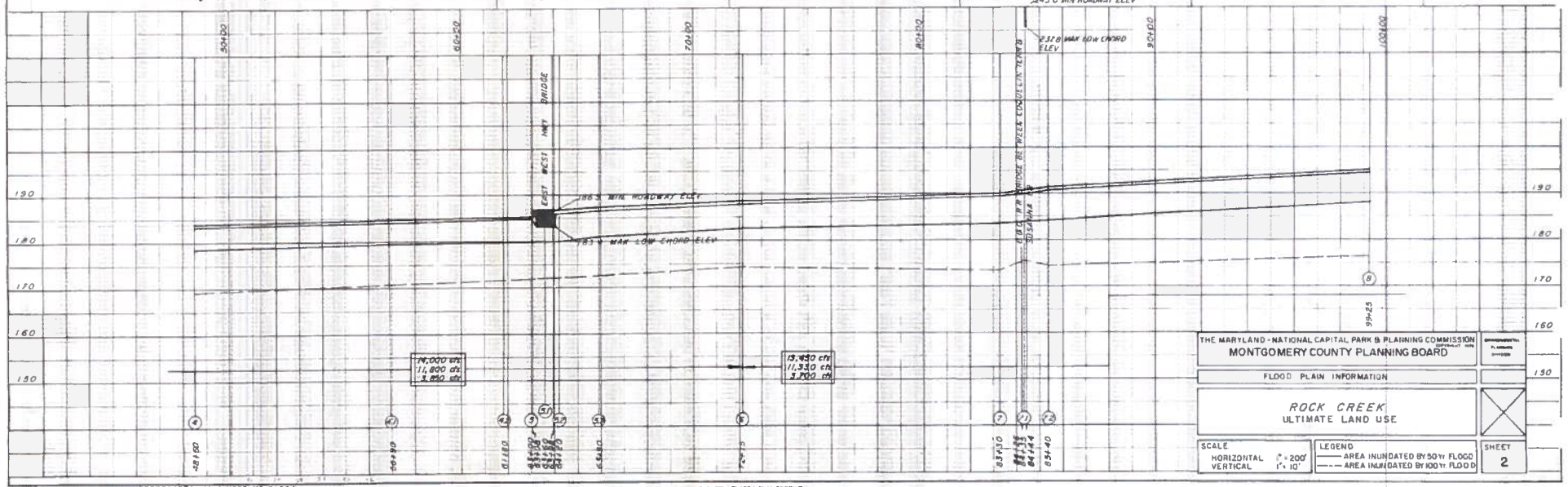
Rev. No.	Date	Notes	Rev. No.	Date	Notes

DATE: 09/20/2019

SHEET:
6 of 6


OVERLAP SHEET 2
WASHINGTON AVE
SHIRLEY LA
PAULINE DR
CAROLINA RD
BEACH DR
ROCK CREEK
MONTGOMERY CO
DISTRICT OF COLUMBIA
N 42,000
N 41,000
817 WSSD
246 G
WESTERN AVE
NOTE
TOPOGRAPHY COMPILED FROM PHOTOGRAMMETRIC METHODS DATED APRIL 1973.
STREAM PROFILE PLOTTED FROM APR TO SEPTEMBER 1973 MAPPING DATA
PLAN
PROFILE
VALLEY BEACH DR & RIVERDALE RD BRIDGE
175.9 MAX ROADWAY ELEV
175.9 MAX LOW CHORD ELEV
VALLEY BEACH DR & ROLLINWOOD DR BRIDGE
175.8 MAX ROADWAY ELEV
175.8 MAX LOW CHORD ELEV
ROLLINWOOD DR & BETHESDA ST. BRIDGE
175.8 MAX ROADWAY ELEV
175.8 MAX LOW CHORD ELEV
M 1,000 cfs
T 1,800 cfs
B 2,850 cfs
THE MARYLAND NATIONAL CAPITAL PARK & PLANNING COMMISSION
MONTGOMERY COUNTY PLANNING BOARD
FLOOD PLAIN INFORMATION
ROCK CREEK
ULTIMATE LAND USE
SCALE
HORIZONTAL 1" = 200'
VERTICAL 1" = 10'
LEGEND
AREA INUNDATED BY 50YR FLOOD
AREA INUNDATED BY 100YR FLOOD
SHEET 1
PHOTOGRAMMETRY BY MAPS, INCORPORATED BALTIMORE, MD 21224
K+E PLATE 1, PLAN-PROFILE





PLAN

PROFILE

THE MARYLAND - NATIONAL CAPITAL PARK & PLANNING COMMISSION
MONTGOMERY COUNTY PLANNING BOARD

FLOOD PLAIN INFORMATION

ROCK CREEK
ULTIMATE LAND USE

SCALE
HORIZONTAL 1" = 200'
VERTICAL 1" = 10'

LEGEND
—— AREA INUNDATED BY 50 Yr. FLOOD
– – – AREA INUNDATED BY 100 Yr. FLOOD

SHEET 2

PHOTOGRAMMETRY BY MAPS, INCORPORATED OF TOWSON, MD. 21204

K+E PLATE 1, PLAN-PROFILE

FLOODPLAIN ANALYSIS

ORIGINAL ROCK CREEK STUDY
INPUT AND OUTPUT HEC 2 DATA

Rock Creek

STORMWATER & WATER QUALITY MANAGEMENT STUDY

prepared for

MONTGOMERY COUNTY PLANNING BOARD

Royce Hanson: (Chairman)
Mable Granke
Richmond Keeney
George Kephart
Helen Scharf

1977

prepared by

CH2M HILL

W9552.A0

The opinions, findings and conclusions expressed in this study are those of CH2M HILL and do not necessarily represent those of the Maryland-National Capital Park and Planning Commission.

TABLE 3.10

PEAK DISCHARGE DATA FOR WATER SURFACE PROFILE COMPUTATIONS

Stream	Stationing		100 Yr Peak Flow cfs	
	From	To	Existing	Ultimate
Rock Creek	D.C. Line	72+15	13,970	14,000
	72+15	188+98	13,420	~~13,450~~
	188+98	311+15	12,310	12,340
	311+15	329+40	11,630	11,650
	329+40	436+00	11,080	11,090
	436+00	473+68	9,580	9,590
	473+68	515+80	9,240	9,260
	515+80	590+50	7,430	7,450
	590+50	658+30	6,420	6,450
	658+30	708+60	5,520	5,550
	708+60	791+60	3,900	4,150
	791+60	809+20	3,250	3,610
	809+20	862+15	Lake Needwood	
	862+15	1021+86	5,300	5,400
	1021+86	1121+70	4,100	4,200
	1121+70	1170+47	3,100	3,200
	1170+47	1207+04	1,090	1,120
	1207+04	1216+33	310	315
Sycamore Creek	0+00	69+35	2,410	2,410
	69+35	88+30	1,490	1,490
Croydon Park	0+00	56+20	2,990	2,990
	56+20	74+25	1,910	1,910
Connecticut Hills	0+00	74+14	3,180	3,180
	74+14	88+35	1,840	1,840
	88+35	95+57	1,270	1,270
Luxmanor	0+00	56+32	1,320	2,300
	56+32	78+12	700	1,210
Kensington Hills	0+00	50+00	2,540	2,540
	50+00	73+60	1,730	1,730
Turkey Branch	0+00	63+40	3,520	4,540
	63+40	101+55	2,590	3,360
	101+55	124+65	1,710	2,180
	124+65	151+15	1,130	1,440
Coquelin Run	0+00	37+25	2,070	2,700
	37+25	80+00	1,450	1,890
Crabbs Branch	0+00	73+58	3,100	3,450
	73+58	113+17	2,450	2,750
	113+17	128+72	1,800	2,050
	128+72	133+38	880	1,005
Mill Creek	0+00	72+70	3,150	3,300
	72+70	111+63	2,600	2,800
	111+63	132+65	1,050	1,140
North Branch	0+00	6+48	270	280
	6+48	55+45	Lake Frank	
	55+45	93+30	7,800	8,200
	93+30	178+73	5,570	5,850
	178+73	240+10	4,500	4,600
	240+10	319+05	3,300	3,500
	319+05	387+70	1,750	1,850
	387+70	414+25	920	980
Southlawn Branch	0+00	49+40	3,100	3,400
	49+40	84+22	1,700	1,820
	84+22	85+30	1,120	1,200
Tributary "B"	0+00	50+35	4,500	4,800
	50+35	67+60	3,380	3,600
	67+60	93+50	2,450	2,700
	93+50	109+13	1,230	1,340

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**********************************************
HHEC2 VERSION UPDATED OCT 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09,10
MODIFICATIONS 52,53,54,55,56,57,58,59
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T1      MNCPPC ROCK CREEK STORMWATER MANAGEMENT STUDY
T2      JOB NUMBER #9552.80              ULTIMATE LAND USE CONDITIONS
T3      ROCK CREEK BELOW NORBECK         2 YEAR FLOOD

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ
        0.       2.         0.         0.  0.002600       0.00       0.0        0.   180.000       0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE
    1.000      0.000     -1.000      0.000      0.000     -0.500      0.000      0.000      0.000      0.000

J3      1.000      2.000      4.000      5.000     21.000     22.000     26.000      0.000      0.000      0.000
NC      0.150      0.150      0.070      0.200      0.400      0.000      0.000      0.000      0.000      0.000
QT      5.000   3950.000   7020.000   9580.000  11800.000  14000.000      0.000      0.000      0.000      0.000

X1   1510.000     13.000    862.000    914.000   1510.000   1510.000   1510.000      0.000      0.000      0.000
GR    181.000      0.000    177.000    164.000    173.000    402.000    173.000    605.000    172.500    777.000
GR    172.500    832.000    172.800    862.000    166.100    867.000    164.900    893.000    173.200    914.000
GR    173.300    952.000    174.000    966.000    181.000   1009.000      0.000      0.000      0.000      0.000
NC      0.000      0.000      0.000      0.500      0.800      0.000      0.000      0.000      0.000      0.000

X1   1556.000      0.000      0.000      0.000     46.000     46.000     46.000      0.000      0.000      0.000
SB      0.000      1.500      2.600      0.000     44.000      0.000    464.000      0.000    164.900    164.900

X1   1564.000     13.000    950.000   1005.000      8.000      8.000      8.000      0.000      0.000      0.000
X2      0.000      0.000      1.000    175.900    171.200      0.000      0.000      0.000      0.000      0.000
BT     13.000      0.000    181.000      0.000    201.000    175.500      0.000    409.000    173.000      0.000
BT    597.000    173.000      0.000    755.000    172.500      0.000    892.000    173.500      0.000    908.000
BT    172.500      0.000    950.000    172.800      0.000    950.000    177.500    171.200   1005.000    177.500
BT    171.200   1005.000    173.500    173.500   1013.000    174.400      0.000   1062.000    181.000      0.000
GR    181.000      0.000    176.000    176.000    174.000    431.000    173.000    628.000    172.500    876.000
GR    173.000    933.000    172.800    950.000    165.400    954.000    164.900    977.000    165.600   1002.000
GR    173.500   1005.000    174.400   1013.000    181.000   1062.000      0.000      0.000      0.000      0.000
                                       0.200      0.400      0.000      0.000      0.000      0.000      0.000
```

	NC	0.000	0.000	0.000						
	X1	3218.000	21.000	1285.000	1345.000	43.000	43.000	43.000	0.000	0.000	0.000
	GR	190.000	0.000	185.000	30.000	181.000	130.000	180.000	160.000	174.900	335.000
	GR	173.000	560.000	173.000	800.000	174.500	1090.000	175.000	1267.000	175.200	1285.000
	GR	168.500	1299.000	168.100	1322.000	169.000	1343.000	177.100	1345.000	177.300	1347.000
	GR	176.000	1427.000	181.000	1544.000	184.200	1628.000	185.000	1635.000	188.500	1665.000
	GR	190.000	1710.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.0	X1	3645.000	25.000	1283.000	1336.000	120.000	450.000	427.000	0.000	0.000	0.000
	GR	190.000	0.000	185.000	60.000	181.000	100.000	180.100	170.000	176.000	400.000
	GR	175.000	509.000	173.000	650.000	173.000	800.000	173.500	900.000	174.000	1045.000
	GR	174.500	1110.000	176.000	1191.000	174.000	1250.000	175.700	1263.000	175.800	1283.000
	GR	169.300	1291.000	167.800	1312.000	169.600	1333.000	175.400	1336.000	175.800	1341.000
	GR	174.000	1350.000	175.500	1377.000	175.500	1399.000	184.000	1456.000	190.000	1461.000
	NC	0.150	0.080	0.060	0.500	0.800	0.000	0.000	0.000	0.000	0.000
	X1	3687.000	24.000	1288.000	1340.000	42.000	42.000	42.000	0.000	0.000	0.000
	GR	190.100	0.000	185.000	70.000	181.000	100.000	180.000	191.000	178.000	300.000
	GR	176.000	400.000	173.000	650.000	173.000	800.000	174.000	900.000	174.500	975.000
	GR	174.000	1055.000	174.000	1165.000	174.000	1263.000	177.900	1288.000	168.500	1290.000
	GR	168.000	1317.000	168.700	1338.000	177.900	1340.000	175.800	1345.000	175.500	1381.000
	GR	175.800	1403.000	184.000	1423.000	185.000	1430.000	190.000	1455.000	0.000	0.000
	X1	3688.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
	X2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	BT	4.000	1288.000	177.900	177.900	1288.000	177.900	175.800	1340.000	177.900	175.800
	BT	1340.000	177.900	177.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	X1	3701.000	0.000	0.000	0.000	13.000	13.000	13.000	0.000	0.100	0.000
	X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	X1	3702.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
	NC	0.000	0.000	0.000	0.200	0.400	0.000	0.000	0.000	0.000	0.000
	X1	3745.000	25.000	1298.000	1365.000	43.000	43.000	43.000	0.000	0.000	0.000
					85.000	180.000	235.000	178.000	368.000	176.000	500.000
								173.500	900.000	174.500	1060.000
											1315.000

	3745.000	25.000	1298.000	1365.000	43.000	43.000	43.000	0.000	0.000	0.000
	190.000	0.000	185.000	85.000	180.000	235.000	178.000	368.000	176.000	500.000
GR	175.000	608.000	173.000	700.000	173.000	800.000	173.500	900.000	174.500	1060.000
GR	174.500	1166.000	174.500	1265.000	175.800	1298.000	175.500	1311.000	169.500	1315.000
GR	168.300	1337.000	168.300	1354.000	176.000	1362.000	176.400	1365.000	175.500	1395.000
GR	175.500	1406.000	175.500	1414.000	184.000	1435.000	185.000	1439.000	190.000	1468.000
	4.0									
X1	4850.000	26.000	852.000	903.000	1040.000	1160.000	1105.000	0.000	0.000	0.000
GR	195.000	0.000	190.000	56.000	186.000	170.000	185.000	228.000	180.100	435.000
GR	177.000	600.000	176.500	710.000	176.000	740.000	175.500	824.000	176.800	849.000
GR	176.700	852.000	170.700	855.000	168.500	858.000	169.200	877.000	169.000	897.000
GR	170.700	901.000	177.200	903.000	177.500	904.000	176.000	1018.000	176.500	1142.000
GR	176.500	1155.000	176.500	1166.000	177.500	1201.000	184.000	1238.000	190.000	1265.000
GR	195.000	1271.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	4.1									
X1	5690.000	19.000	460.000	504.000	600.000	690.000	840.000	0.000	0.000	0.000
GR	190.000	0.000	187.500	100.000	188.000	200.000	185.000	241.000	180.100	291.000
GR	177.000	400.000	175.000	450.000	172.000	460.000	171.000	462.000	170.800	482.000
GR	171.000	502.000	172.000	504.000	175.000	511.000	177.500	750.000	177.000	850.000
GR	180.000	980.000	181.000	1025.000	185.000	1075.000	190.000	1096.000	0.000	0.000
	4.2									
X1	6180.000	17.000	586.000	661.000	530.000	400.000	490.000	0.000	0.000	0.000
GR	191.000	0.000	186.500	200.000	184.000	300.000	180.000	425.000	179.000	510.000
GR	175.000	586.000	172.800	593.000	172.000	595.000	171.600	622.000	172.000	649.000
GR	172.800	651.000	175.000	661.000	180.000	755.000	180.500	850.000	181.500	1080.000
GR	185.000	1142.000	190.000	1153.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.500	0.800	0.000	0.000	0.000	0.000	0.000
X1	6308.000	0.000	0.000	0.000	90.000	170.000	128.000	0.000	0.200	0.000
SB	1.000	1.500	2.800	0.000	85.500	6.000	1413.000	6.000	172.300	172.100
X1	6398.000	17.000	449.000	532.000	90.000	90.000	90.000	0.000	-0.200	0.000
X2	0.000	0.000	1.000	183.400	180.000	0.000	0.000	0.000	0.000	0.000
BT	9.000	0.000	187.000	0.000	112.000	186.000	0.000	345.000	186.000	0.000
BT	345.000	189.000	0.000	534.000	189.000	0.000	534.000	186.000	0.000	639.000
BT	186.000	0.000	729.000	187.000	0.000	1140.000	187.000	0.000	0.000	0.000
GR	195.000	0.000	184.900	112.000	181.000	200.000	181.000	350.000	180.000	449.000
GR	175.000	464.000	175.900	471.000	173.500	473.000	172.500	493.000	173.500	513.000
GR	175.900	515.000	175.000	521.000	180.100	532.000	182.000	650.000	185.000	800.000
GR	184.900	880.000	190.000	1030.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.150	0.200	0.070	0.200	0.400	0.000	0.000	0.000	0.000	0.000
	6500.000	0.000	0.000	0.000	230.000	108.000	192.000	0.000	0.200	0.000

```
      0.24        1.21        3.71        1.95       0.135       0.054       0.072       0.099      168.00       89.09
  0.000774         42.         42.         42.           0           0           1        0.00     1330.15     1419.23
```

EE

```
 NORMAL BRIDGE,NRD=  4 MIN ELTRD=   177.90 MAX ELLC=   177.90

   3688.00       14.50      182.50        0.00        0.00      182.53        0.04        0.00        0.01      177.90
     14000.      11706.      1249.       1045.       8651.       614.        480.        267.         38.       177.90
      0.24        1.35        2.04        2.18       0.135       0.054       0.072       0.099      168.00       88.79
  0.000962          1.          1.          1.           2           0           1     -105.00     1330.54     1419.33


 NORMAL BRIDGE,NRD=  4 MIN ELTRD=   177.90 MAX ELLC=   178.00

   3701.00       14.41      182.51        0.00        0.00      182.54        0.04        0.01        0.00      178.00
     14000.      11686.      1273.       1039.       8545.       614.        473.        270.         38.       178.00
      0.25        1.37        2.07        2.20       0.135       0.054       0.072       0.098      168.10       89.45
  0.000996          13.         13.         13.           0           0           1     -100.00     1329.66     1419.11

   3702.00       14.40      182.50        0.00        0.00      182.57        0.06        0.00        0.02      178.00
     14000.      10403.      2672.        925.       8546.       714.        473.        270.         38.       178.00
      0.25        1.22        3.74        1.96       0.135       0.054       0.072       0.098      168.10       89.45
  0.000789          1.          1.          1.           0           0           1        0.00     1329.67     1419.12

 CCHV=   0.200 CEHV=   0.400
   3745.00       14.23      182.53        0.00        0.00      182.61        0.07        0.04        0.00      175.80
     14000.      10163.      3031.        806.       7985.       774.        393.        279.         40.       176.40
      0.25        1.27        3.92        2.05       0.135       0.054       0.072       0.097      168.30       158.83
  0.000875          43.         43.         43.           1           0           1        0.00     1272.56     1431.39

   4850.00       15.14      183.04        0.00        0.00      183.82        0.18        1.18        0.04      176.70
     14000.       4037.      3814.       6148.       2957.       719.       2221.        463.         67.       177.20
      0.35        1.37        5.31        2.77       0.135       0.054       0.072       0.079      168.50       285.26
  0.001376        1040.       1105.       1160.           2           0           1        0.00      950.71     1235.98
```

4.1

5690.00	13.72	184.52	0.00	0.00	184.66	0.15	0.83	0.01	172.00
14000.	1619.	2957.	9424.	1286.	597.	3820.	553.	80.	172.00
0.42	1.26	4.95	2.47	0.135	0.054	0.072	0.076	170.80	245.93
0.001017	600.	840.	690.	2	0	1	0.00	823.03	1068.96

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
6180.00	13.41	185.01	0.00	0.00	185.33	0.32	0.60	0.07	175.00
14000.	2213.	6066.	5721.	1473.	953.	2189.	606.	89.	175.00
0.45	1.50	6.37	2.61	0.135	0.054	0.072	0.074	171.60	259.63
0.001836	530.	490.	400.	2	0	1	0.00	882.39	1142.02

CCHV= 0.500 CEHV= 0.800

6308.00	13.47	185.27	0.00	0.00	185.59	0.31	0.25	0.00	175.20
14000.	2221.	6026.	5753.	1494.	957.	2219.	621.	92.	175.20
0.46	1.49	6.30	2.59	0.135	0.054	0.072	0.073	171.80	257.18
0.001782	90.	128.	170.	2	0	1	0.00	884.98	1142.16

SPECIAL BRIDGE

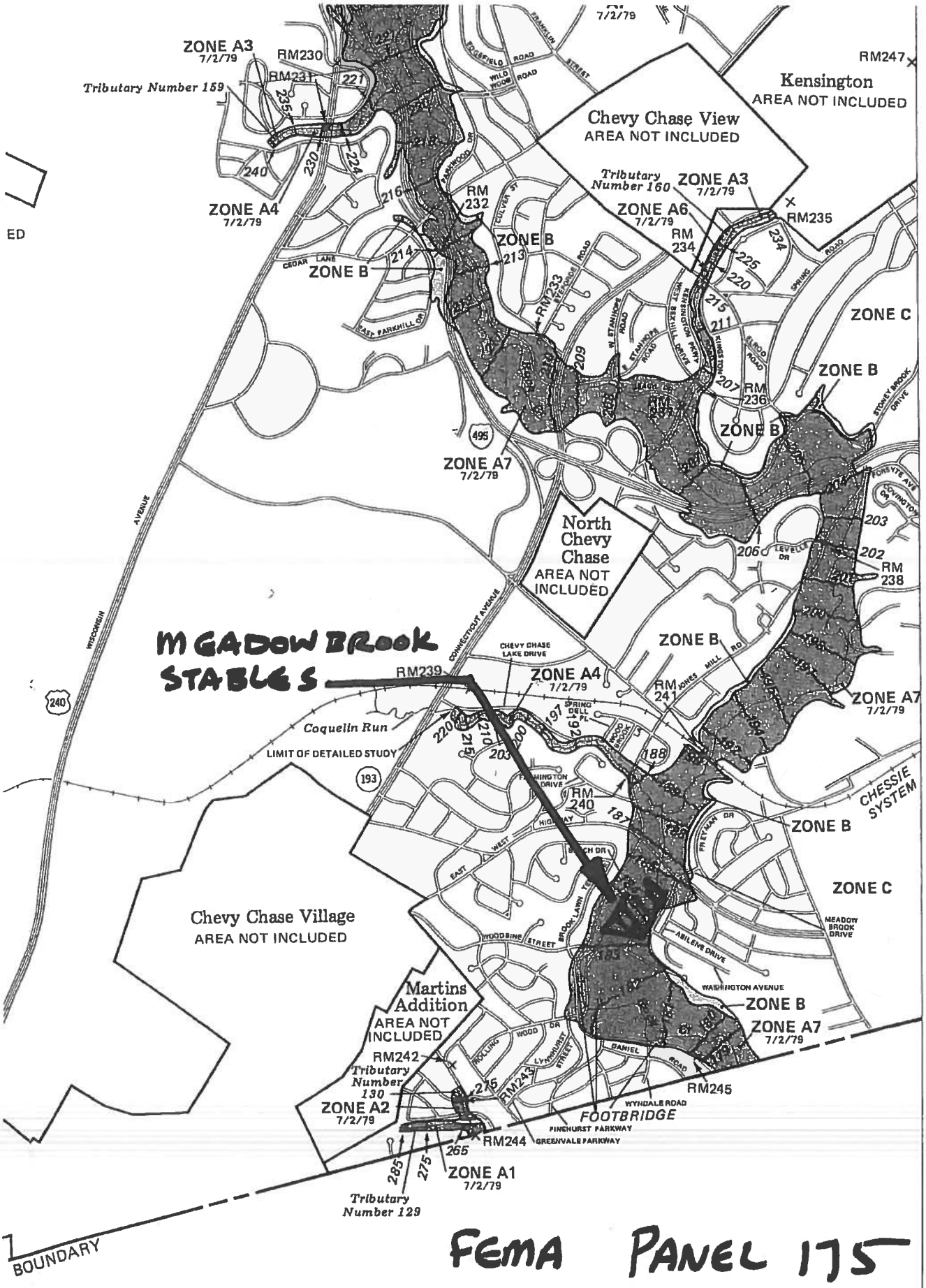
SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.00	1.50	2.80	0.00	85.50	6.00	1413.00	6.00	172.30	172.10

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
187.56	186.12	0.01	1423.	12552.	1413.	1622.	183.40	186.00

6398.00	14.40	186.70	0.00	0.00	187.11	0.41	1.52	0.00	179.80
14000.	3270.	6928.	3802.	1890.	998.	1417.	630.	94.	179.90
0.47	1.73	6.94	2.68	0.135	0.054	0.072	0.072	172.30	89.77
0.002474	90.	90.	90.	2	0	3	0.00	849.19	938.96

FEMA DATA



This map is for f
sarily show all a
all planimetric fe

For adjoining m
Panels.

For descriptions
see Panel 240049

FLOOD I

FLOOD

FLOOD

August 1, 1984-t
designations.

To determine
contact your ir
Program, at (80

2000

FEMA

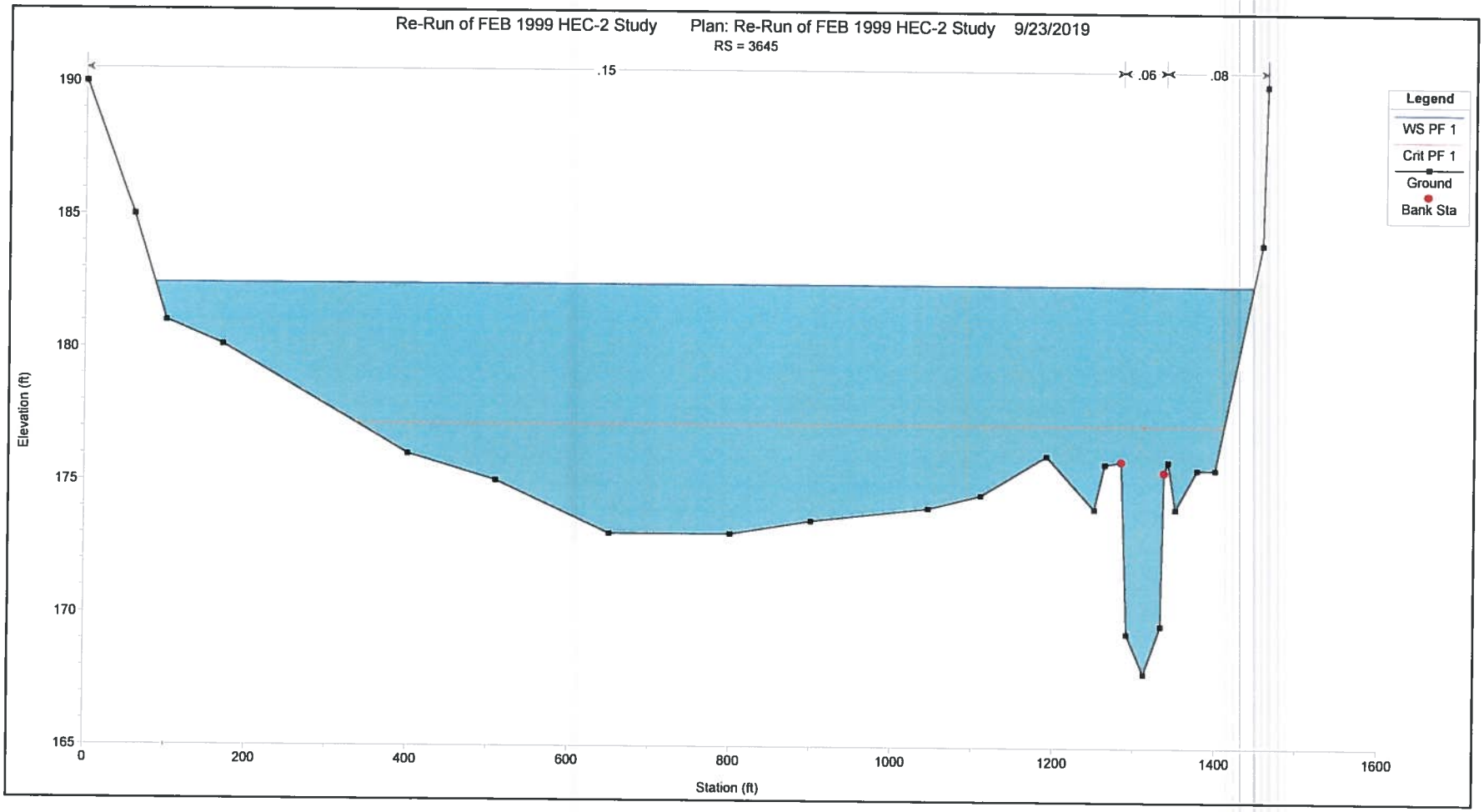
TABLE 1 - SUMMARY OF DISCHARGES

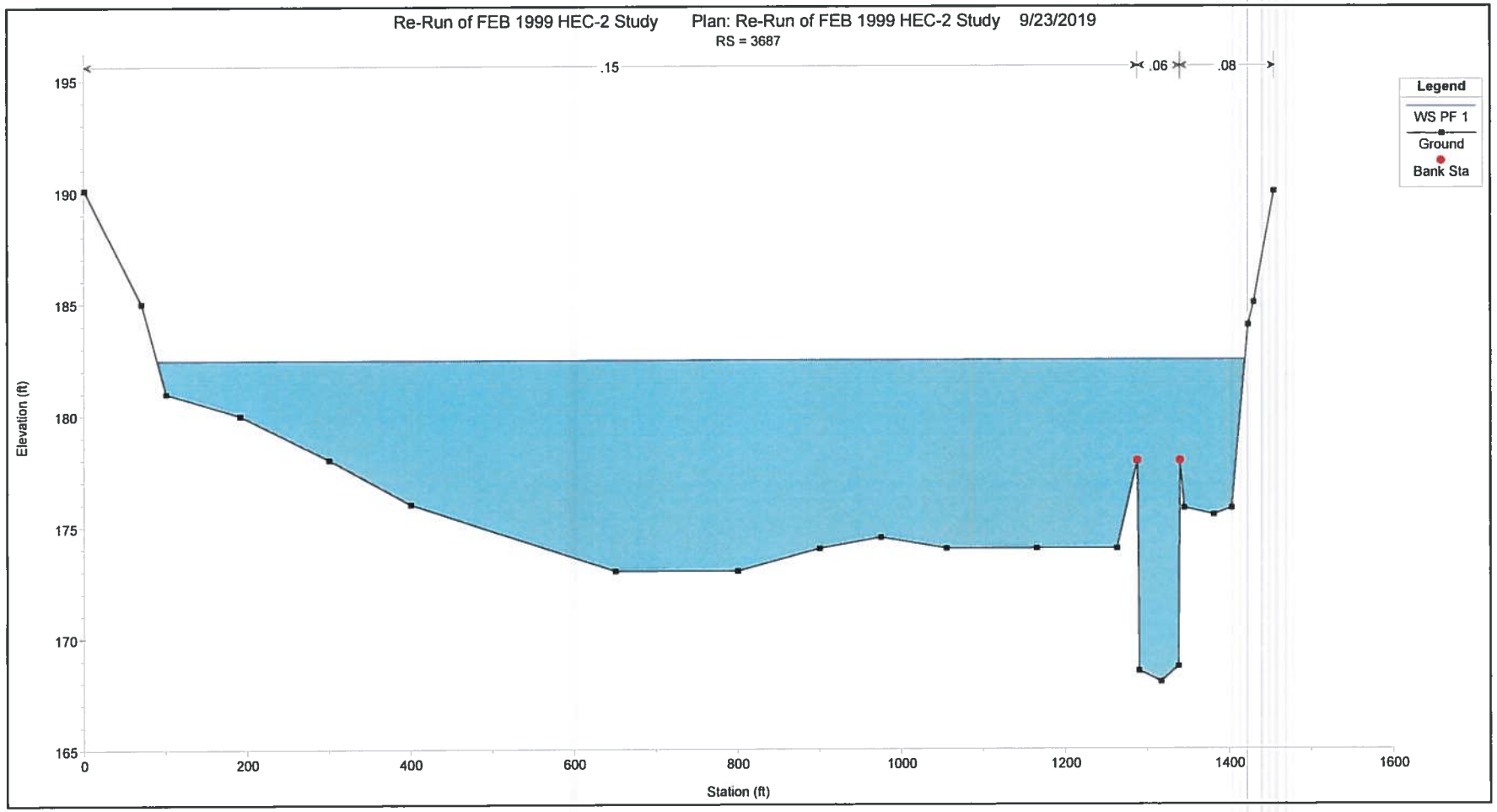
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
ROCK CREEK					
Downstream County Boundary	59.0	6,780	11,690	13,970	24,000
Cross Section AO (near Beach Drive)	48.3	5,640	9,730	11,630	21,000
Cross Section BO (near Randolph Road)	36.7	3,620	6,220	7,430	17,000
Cross Section CA (near Viers Mill Road)	33.3	3,070	5,350	6,420	15,500
Cross Section CY (near dam)	12.4	230	250	255	3,900
Cross Section DA (near Nedwood Road)	8.1	1,600	3,900	5,300	9,200
Cross Section EF (near upstream limit of study)	2.2	720	2,100	3,100	5,400
NORTH BRANCH ROCK CREEK					
Confluence with Rock Creek	12.0	190	265	270	3,700
Cross Section A	10.0	2,400	5,700	7,800	14,000
Cross Section W	3.9	820	2,300	3,300	5,800
Cross Section AF	1.5	440	1,200	1,750	3,000
SENECA CREEK					
Upstream at confluence with Great Seneca Creek	39.0	4,550	9,500	13,000	(1)
Upstream at confluence with the Potomac River	128.2	7,500	16,500	22,000	(1)
BOOZE CREEK					
Upstream at confluence of Bulls Run	1.08	550	1,115	1,453	2,549
Downstream at confluence of Bulls Run	2.75	1,138	2,307	3,007	5,273
BUCK BRANCH					
Bells Mill Road	1.23	612	1,241	1,618	2,837
BULLS RUN					
Upstream at confluence with Booze Creek	1.67	782	1,584	2,065	3,622

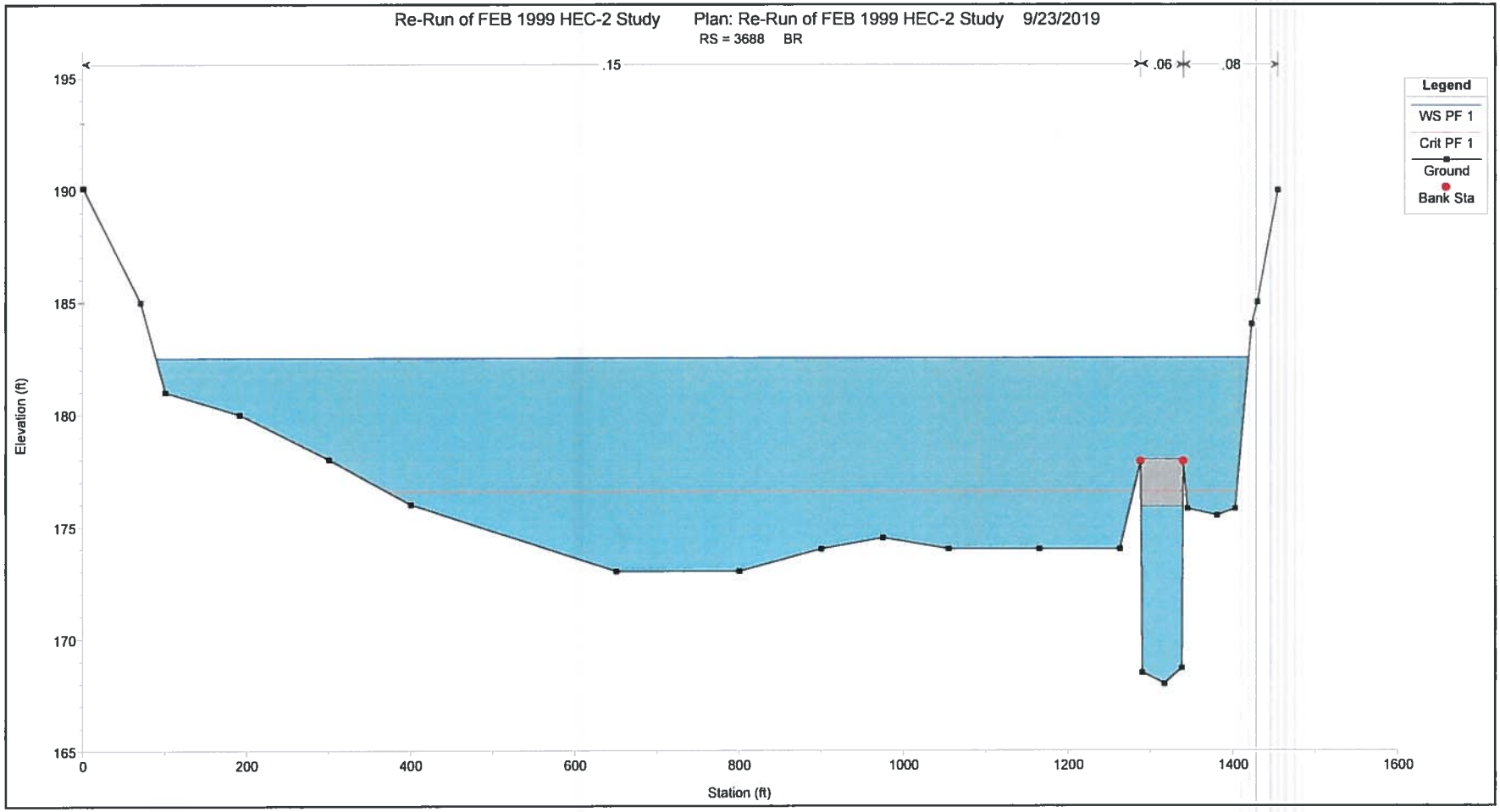
[1]No 500-year discharge developed.

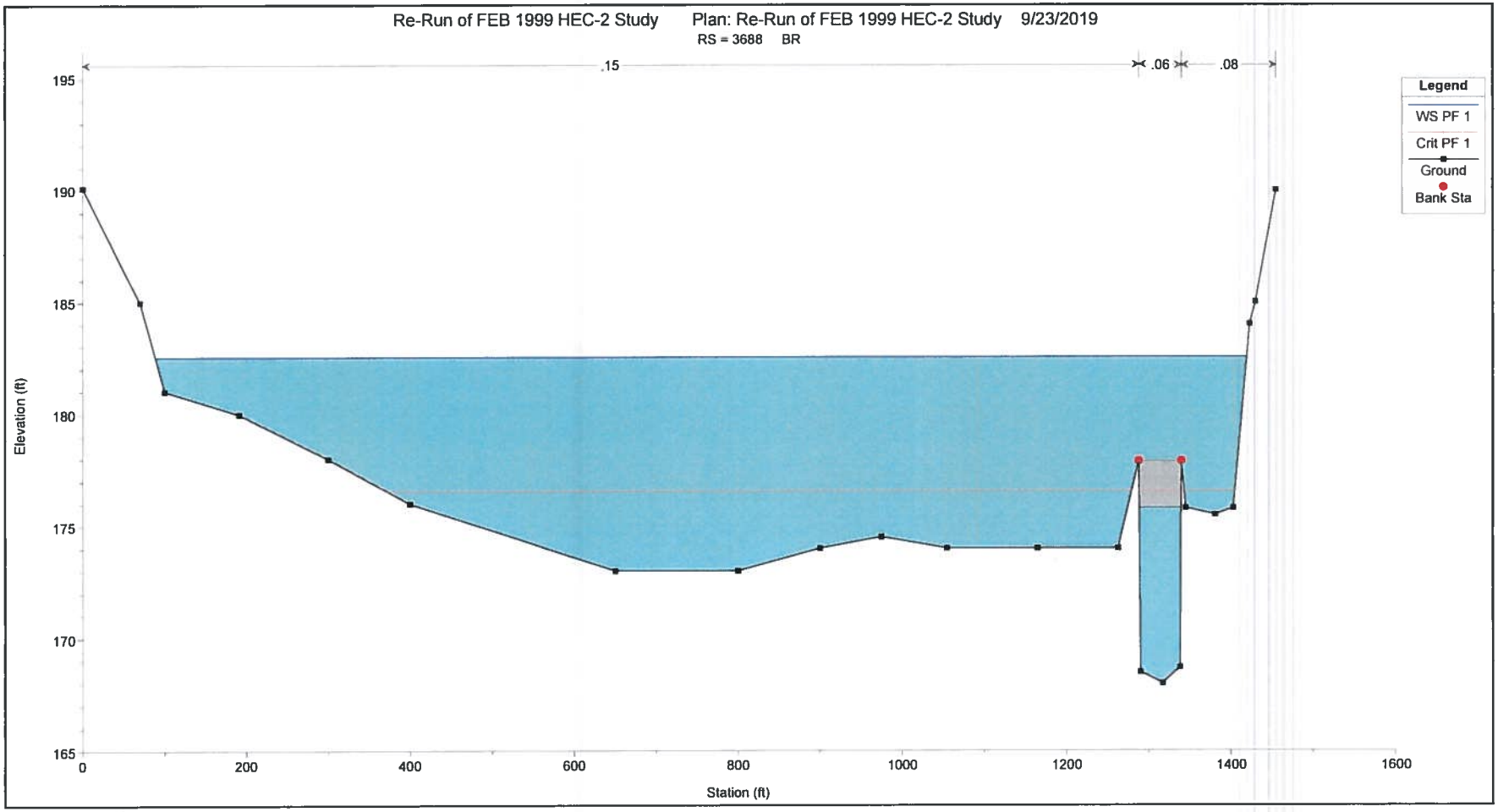
FLOODPLAIN ANALYSIS

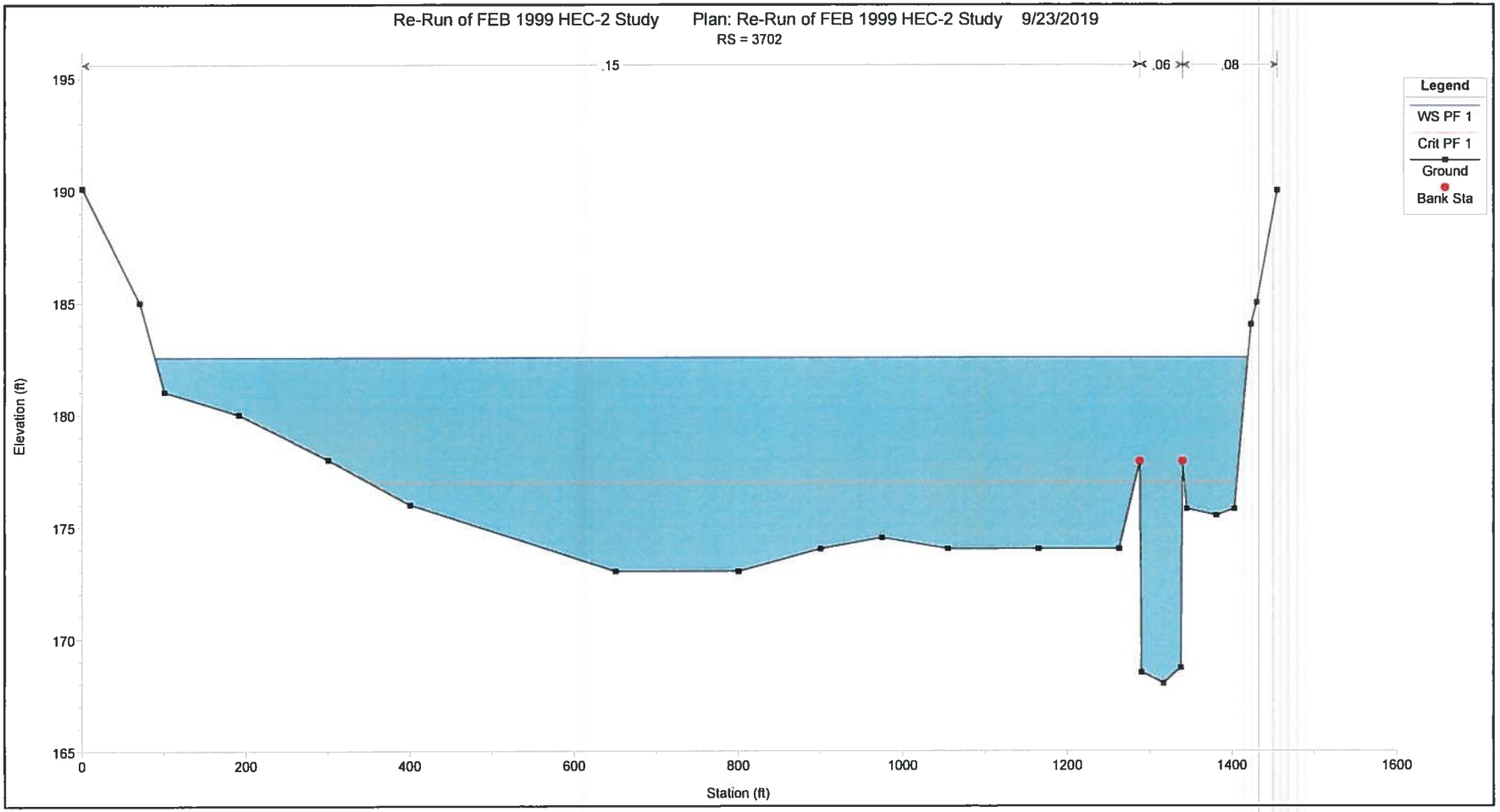
ROCK CREEK STUDY INPUT DATA
RE-RUN THROUGH HEC-RAS


Re-Run of FEB 1999 HEC-2 Study
Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 3645
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Re-Run of FEB 1999 HEC-2 Study
Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 3687
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Re-Run of FEB 1999 HEC-2 Study
Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 3688 BR
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Re-Run of FEB 1999 HEC-2 Study
Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 3688 BR
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Re-Run of FEB 1999 HEC-2 Study Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
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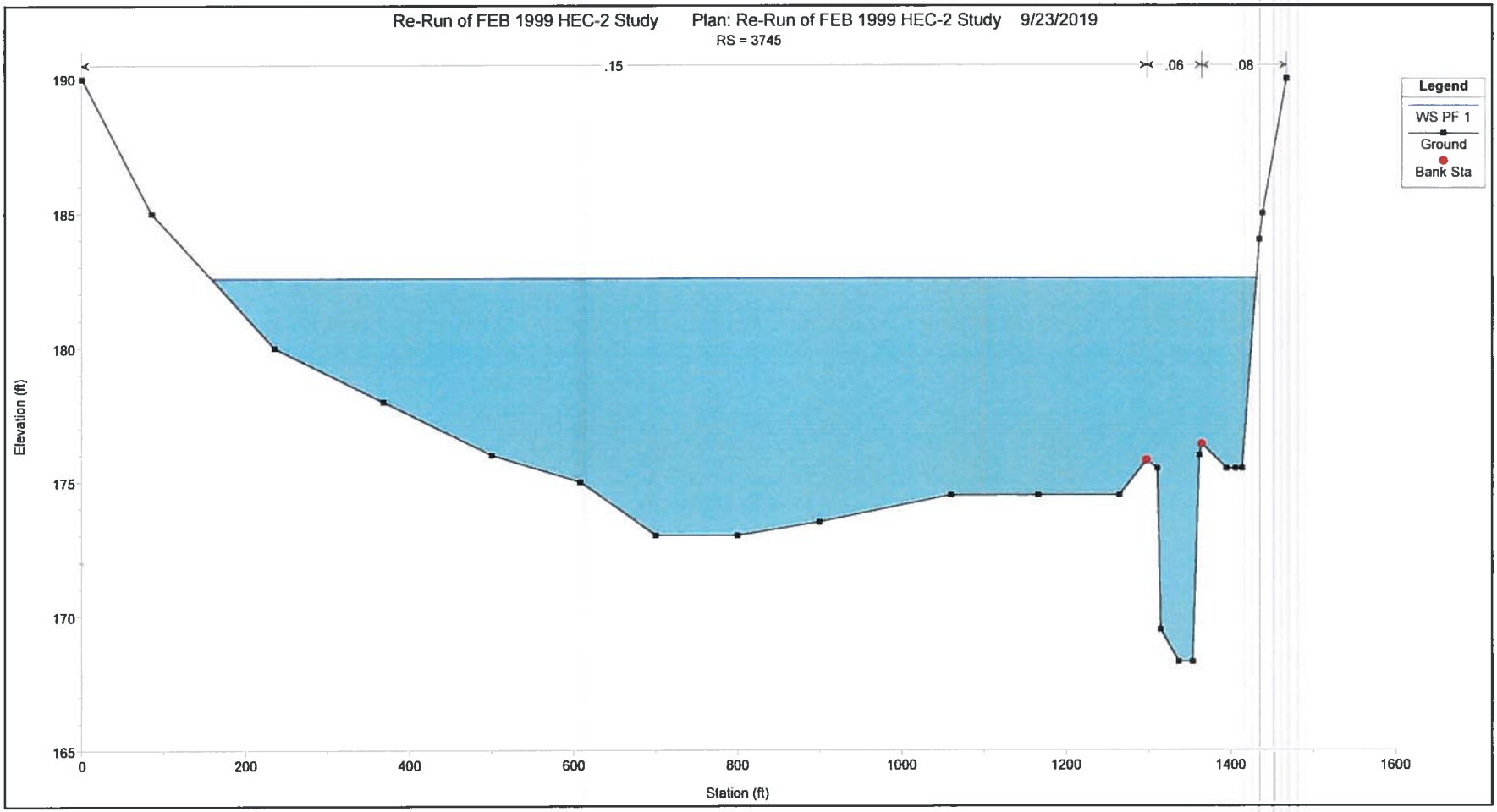
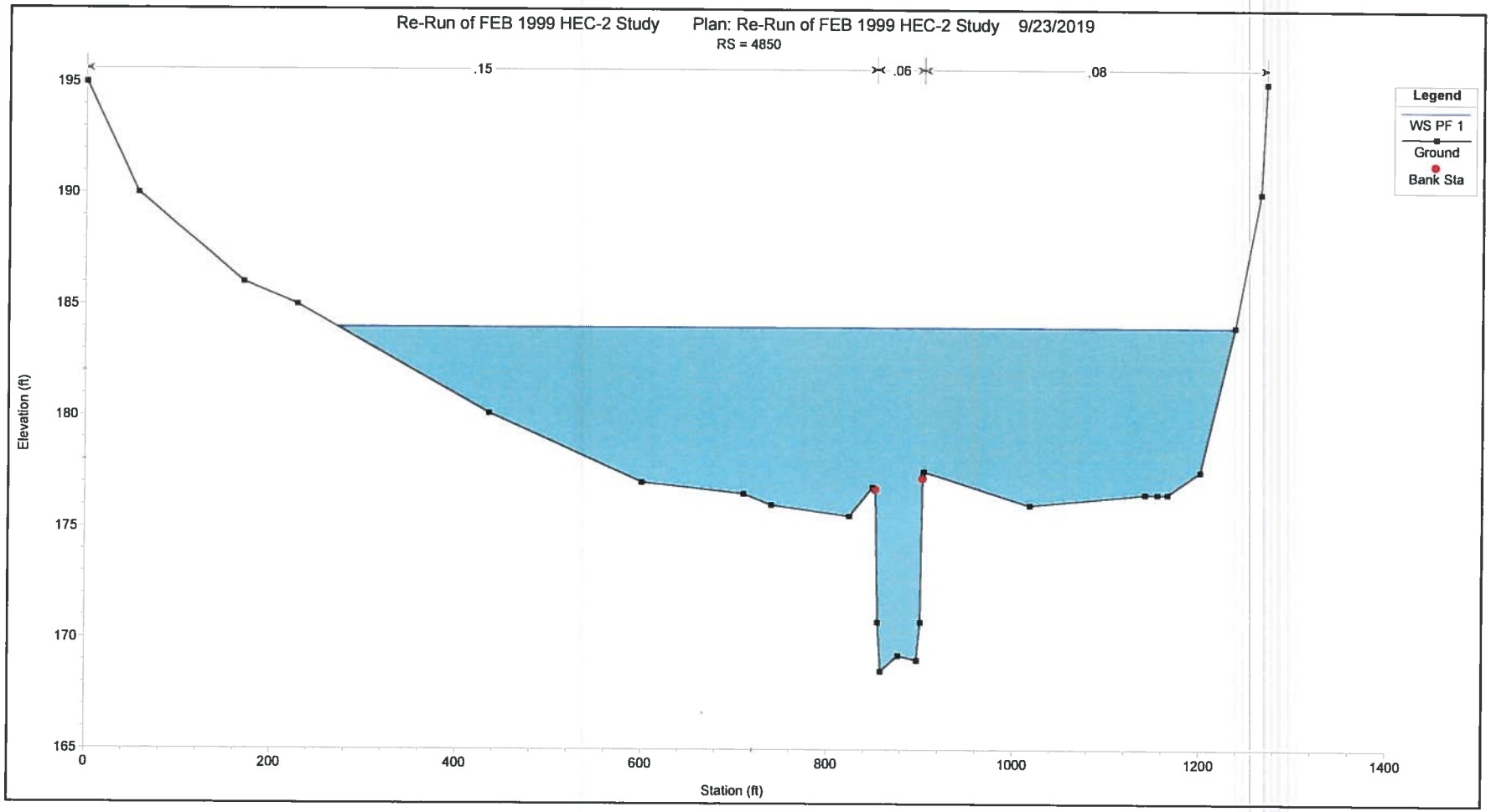
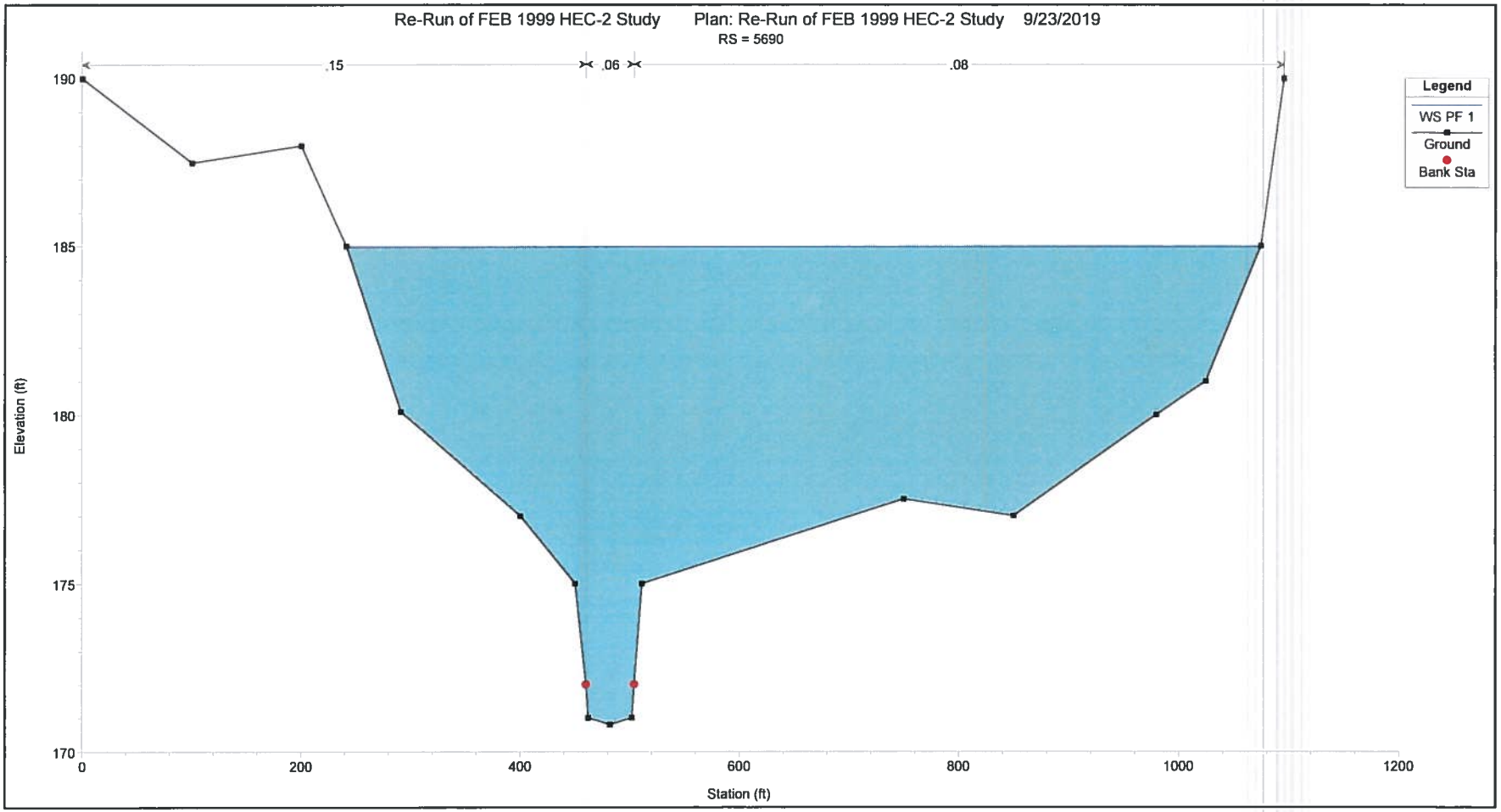
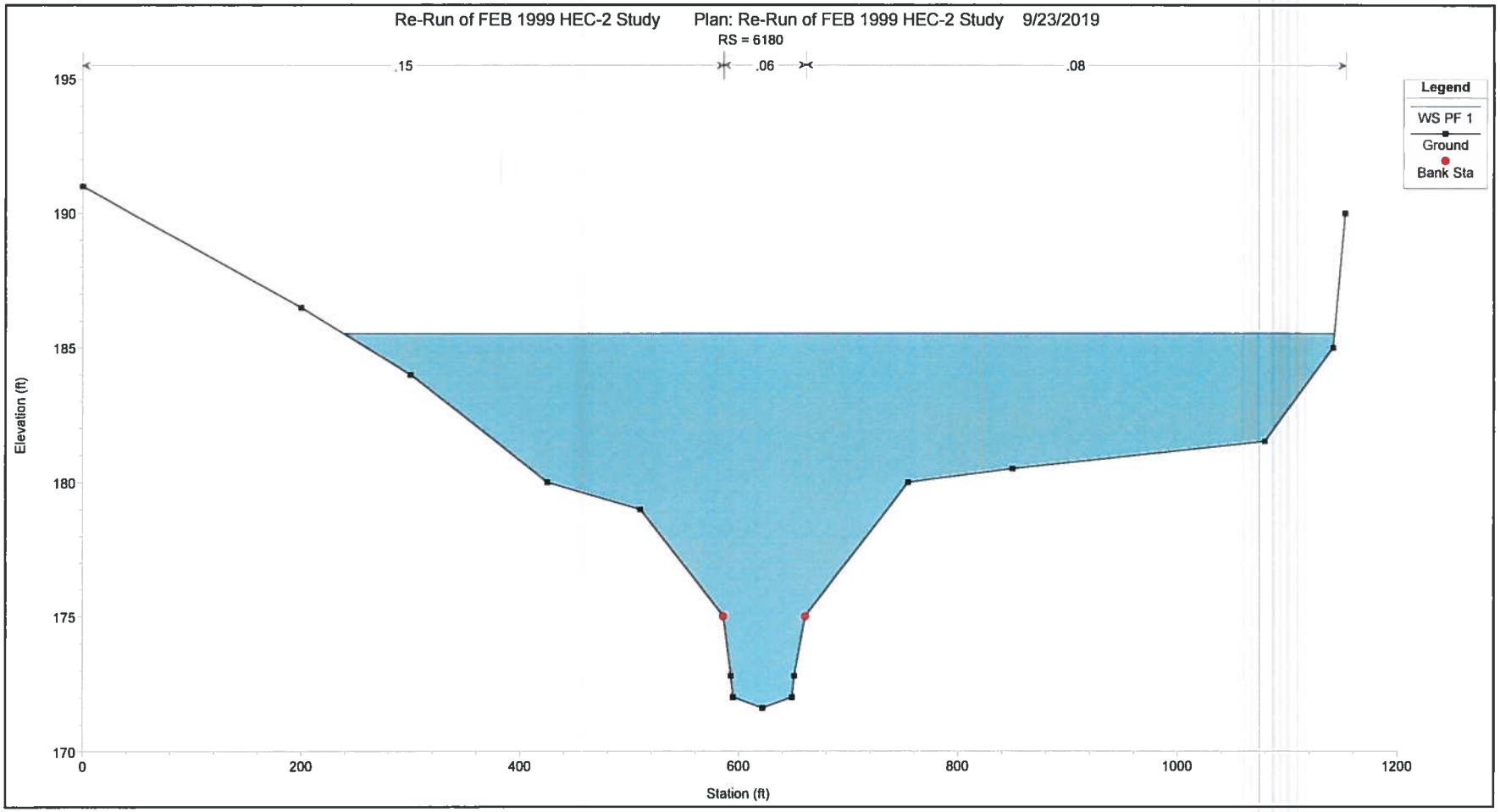
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Re-Run of FEB 1999 HEC-2 Study Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 3745
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

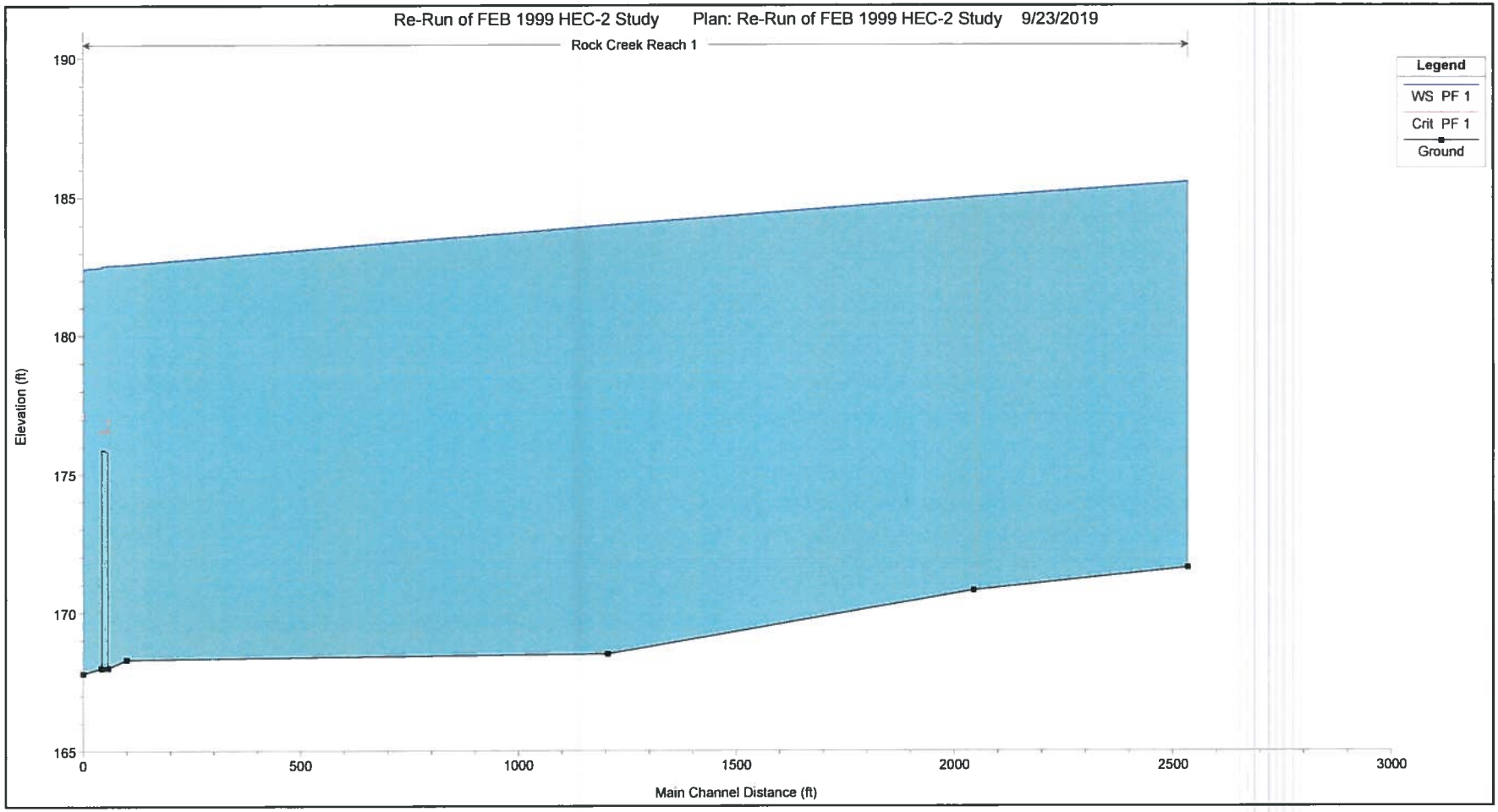

Re-Run of FEB 1999 HEC-2 Study
Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 4850
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)


Re-Run of FEB 1999 HEC-2 Study Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 5690
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)


Re-Run of FEB 1999 HEC-2 Study Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
RS = 6180
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)

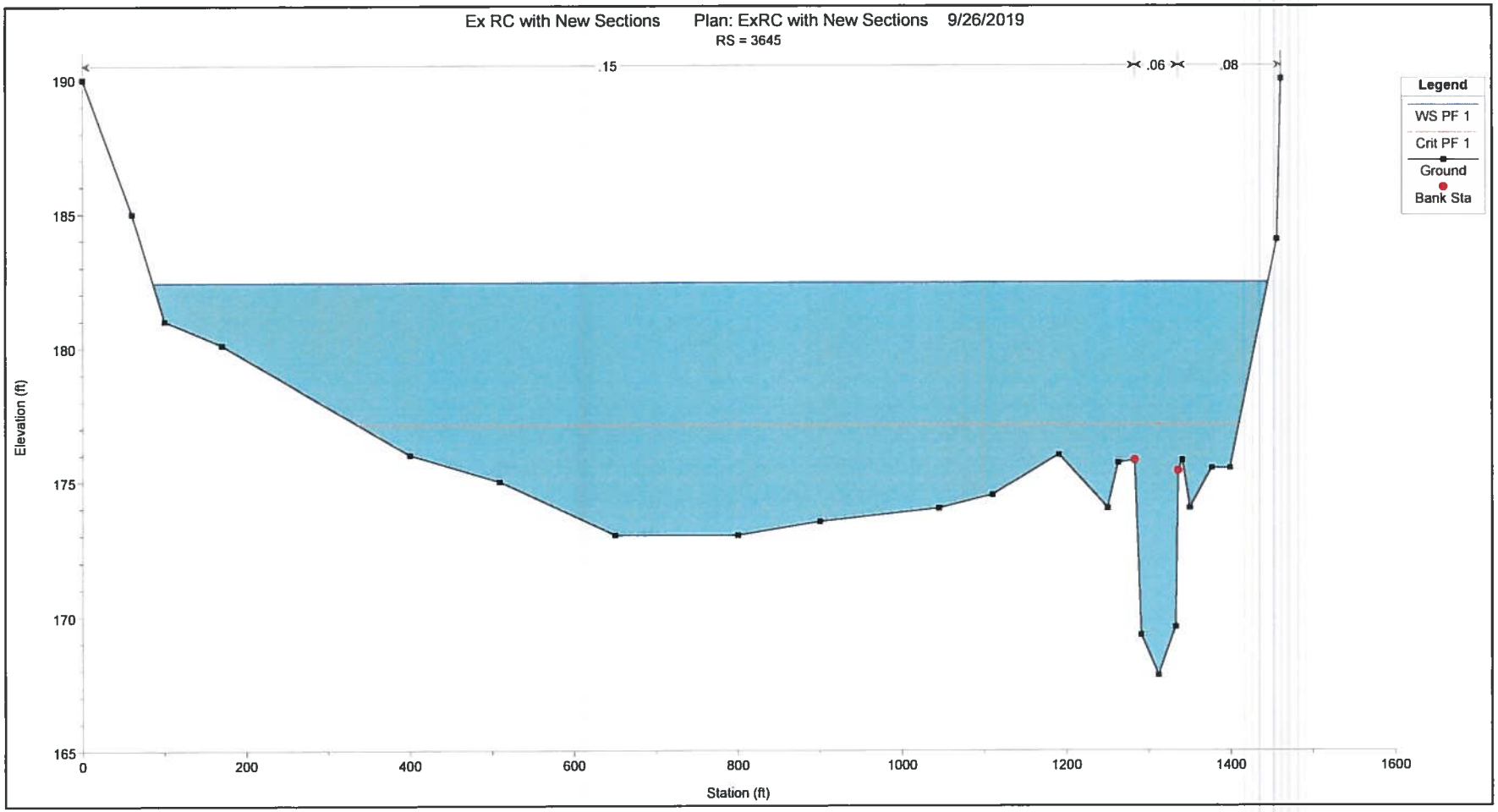
HEC-RAS Plan: Original River: Rock Creek Reach: Reach 1 Profile: PF 1

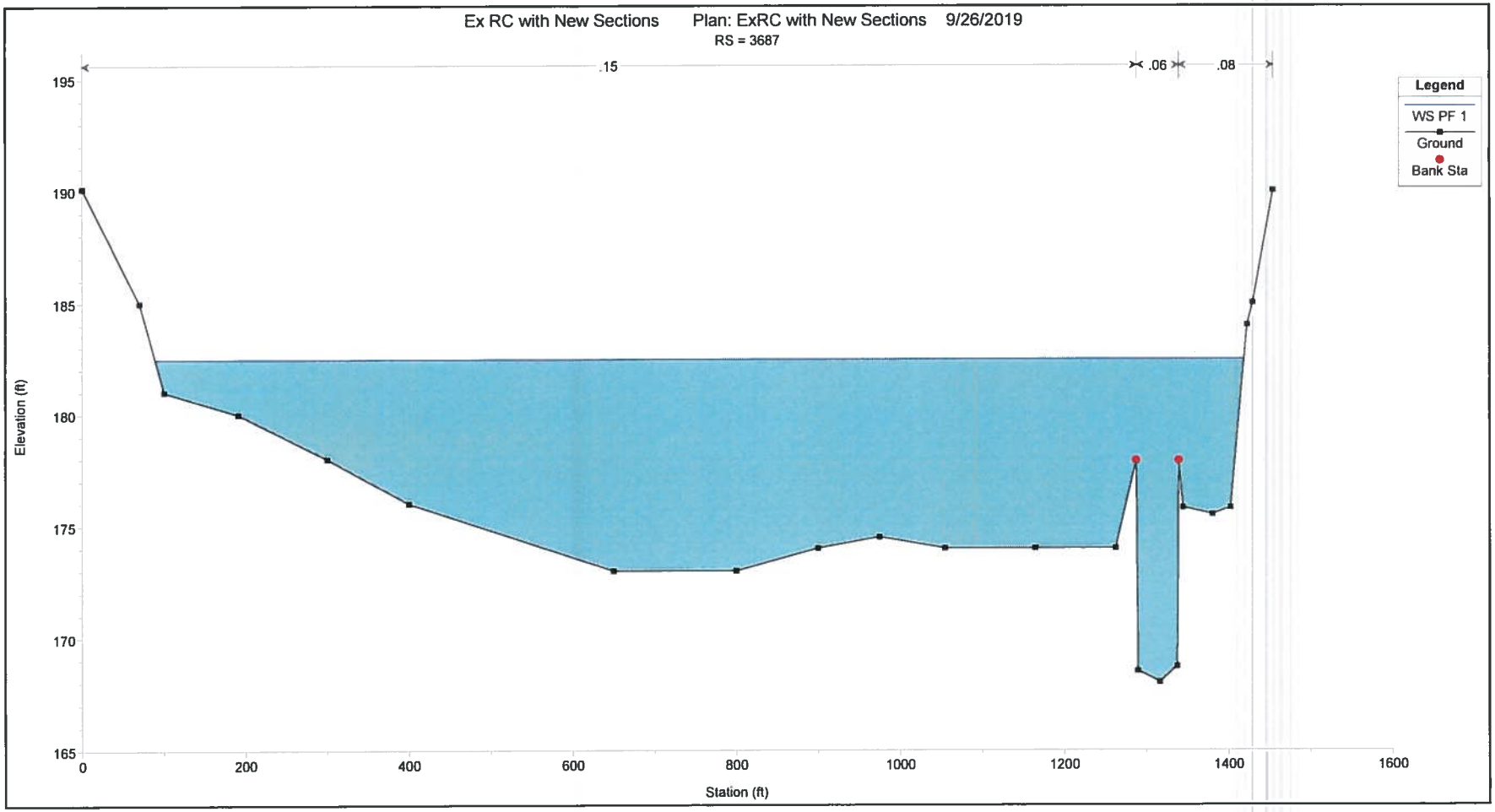
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Headloss	LOB Elev	ROB Elev
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)
Reach 1	3645	14000.00	167.80	182.42	177.12	182.49	0.001047	4.12	9765.92	1359.61	0.20		175.80	175.40
Reach 1	3687	14000.00	168.00	182.47		182.54	0.001042	3.88	9822.44	1330.34	0.18	0.05	177.90	177.90
Reach 1	3688	Bridge												
Reach 1	3702	14000.00	168.00	182.53	176.98	182.60	0.001016	3.85	9902.81	1330.94	0.18	0.03	177.90	177.90
Reach 1	3745	14000.00	168.30	182.57		182.65	0.001176	4.09	9194.78	1273.66	0.21	0.05	175.80	176.40
Reach 1	4850	14000.00	168.50	183.99		184.17	0.001588	5.22	6231.50	967.45	0.24	1.51	176.70	177.20
Reach 1	5690	14000.00	170.80	184.98		185.12	0.001129	4.81	6088.92	833.62	0.23	0.95	172.00	172.00
Reach 1	6180	14000.00	171.60	185.54		185.83	0.001955	6.08	5089.81	904.80	0.29	0.71	175.00	175.00

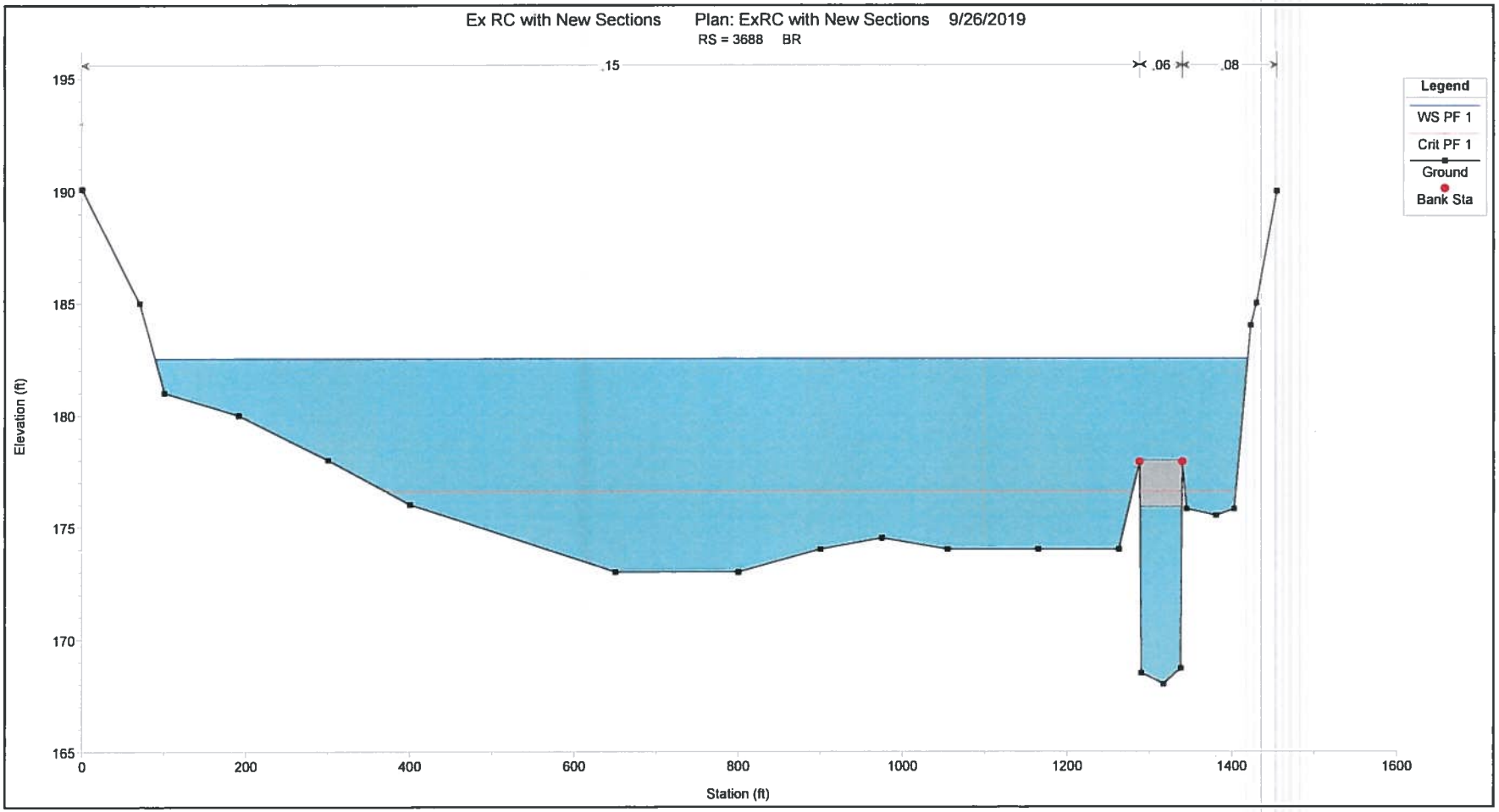

Re-Run of FEB 1999 HEC-2 Study Plan: Re-Run of FEB 1999 HEC-2 Study 9/23/2019
Rock Creek Reach 1
Legend
WS PF 1
Crit PF 1
Ground
Elevation (ft)
190
185
180
175
170
165
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)

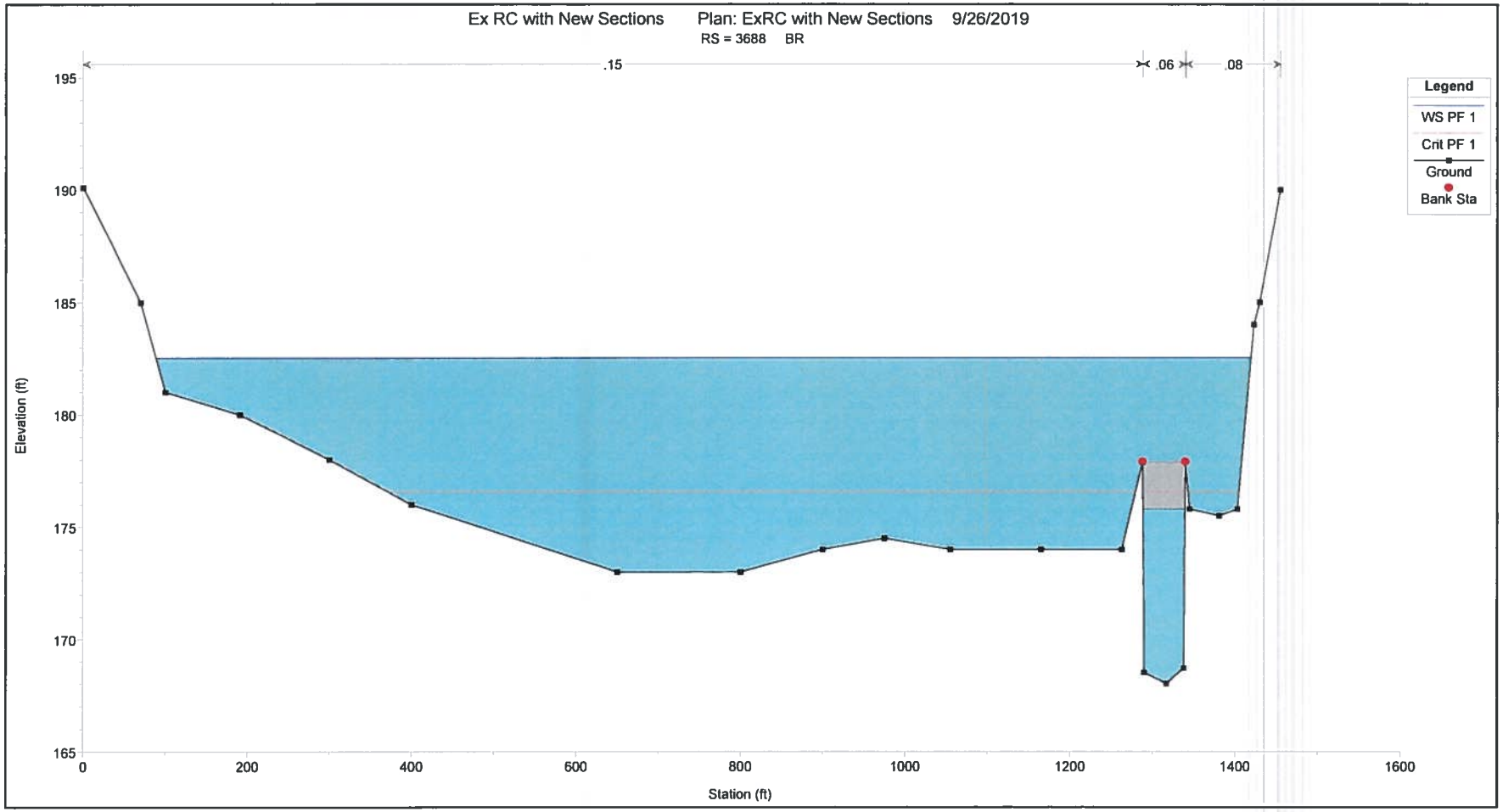
FLOODPLAIN ANALYSIS

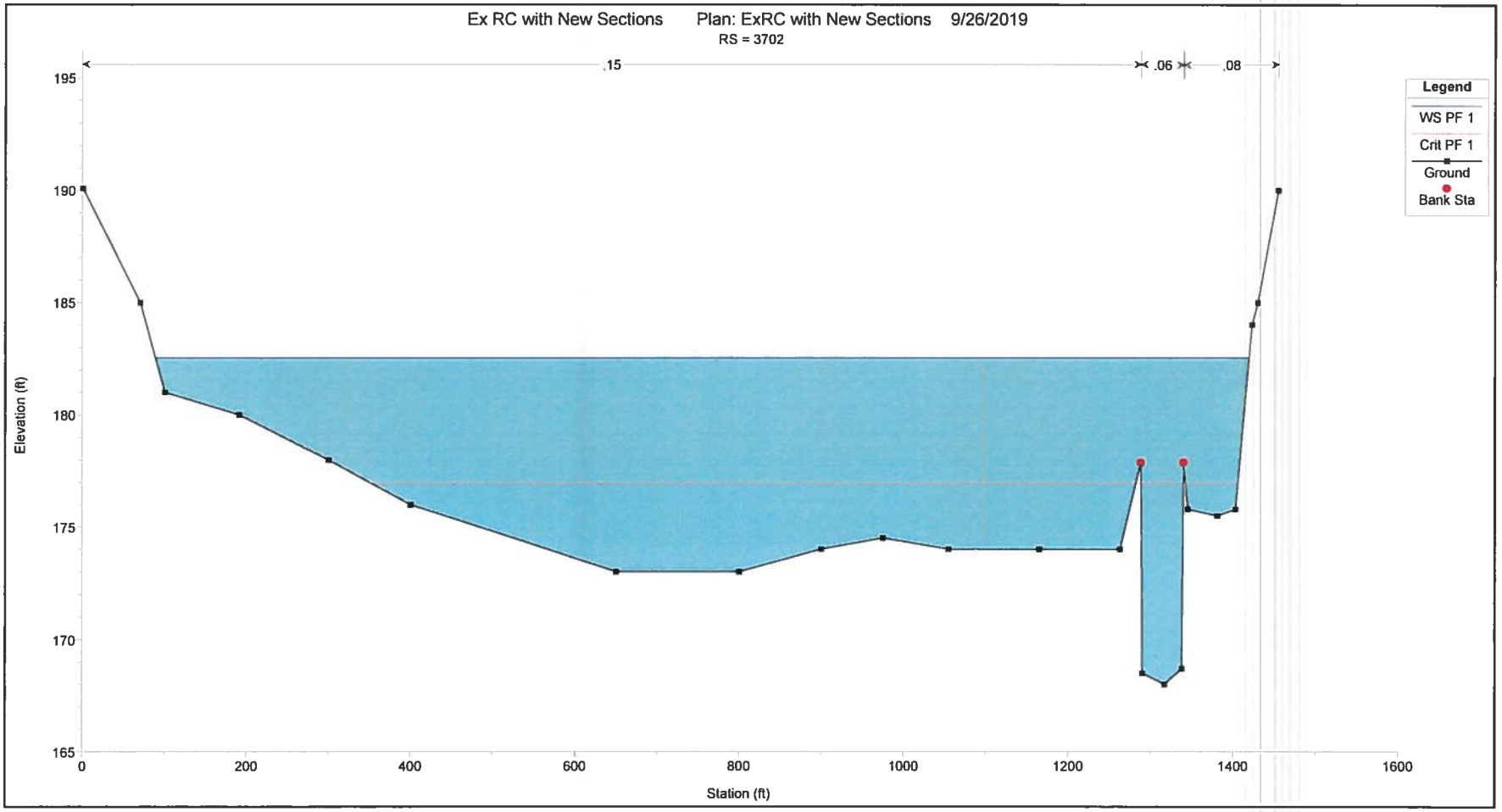
EXISTING CHANNEL CONDITIONS
WITH NEW SECTIONS INSERTED


Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 3645
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Ex RC with New Sections
Plan: ExRC with New Sections 9/26/2019
RS = 3687
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 3688 BR
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Ex RC with New Sections
Plan: ExRC with New Sections 9/26/2019
RS = 3688 BR
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600


Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 3702
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.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
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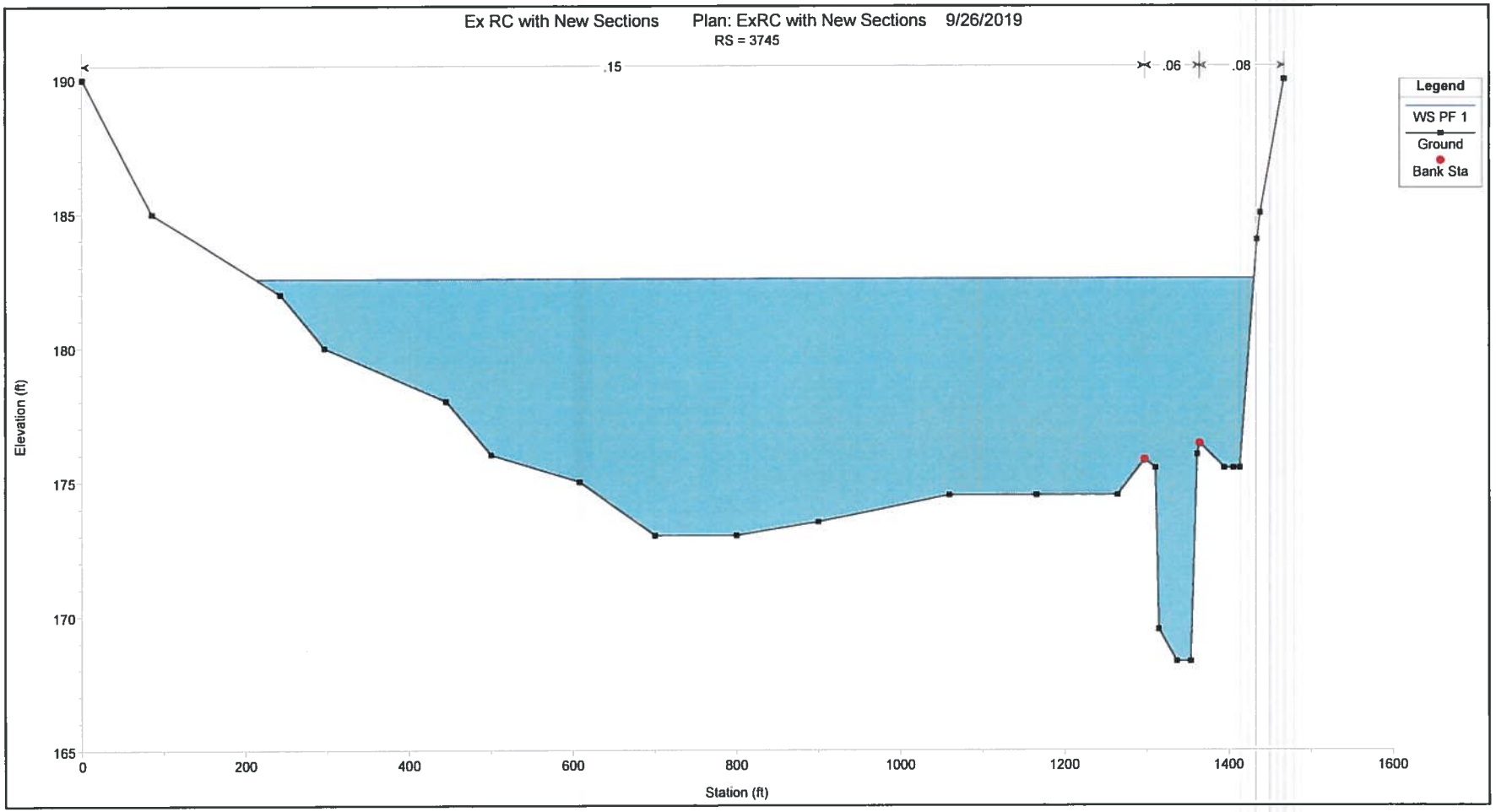
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
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.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
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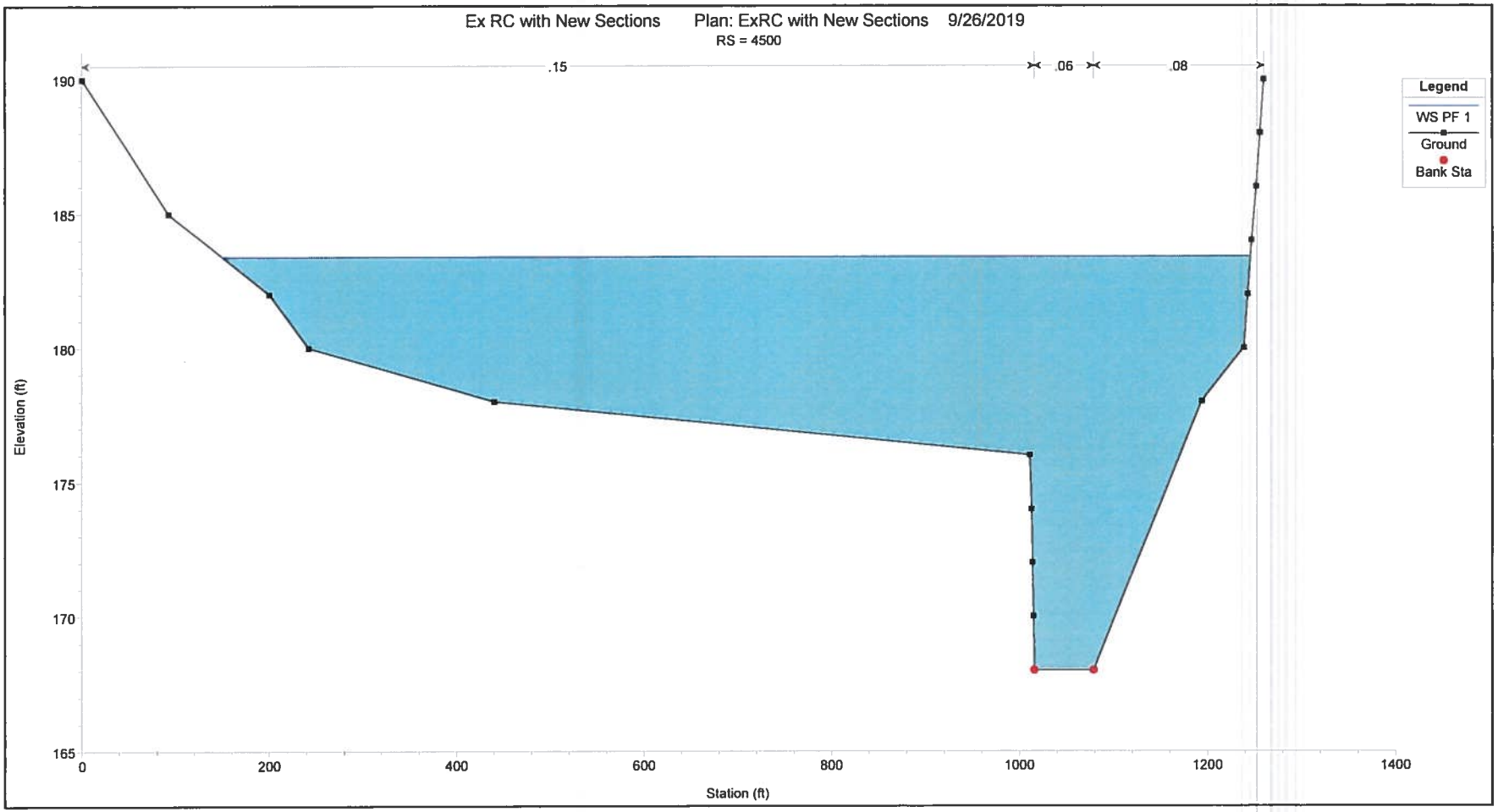
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)


Ex RC with New Sections
Plan: ExRC with New Sections 9/26/2019
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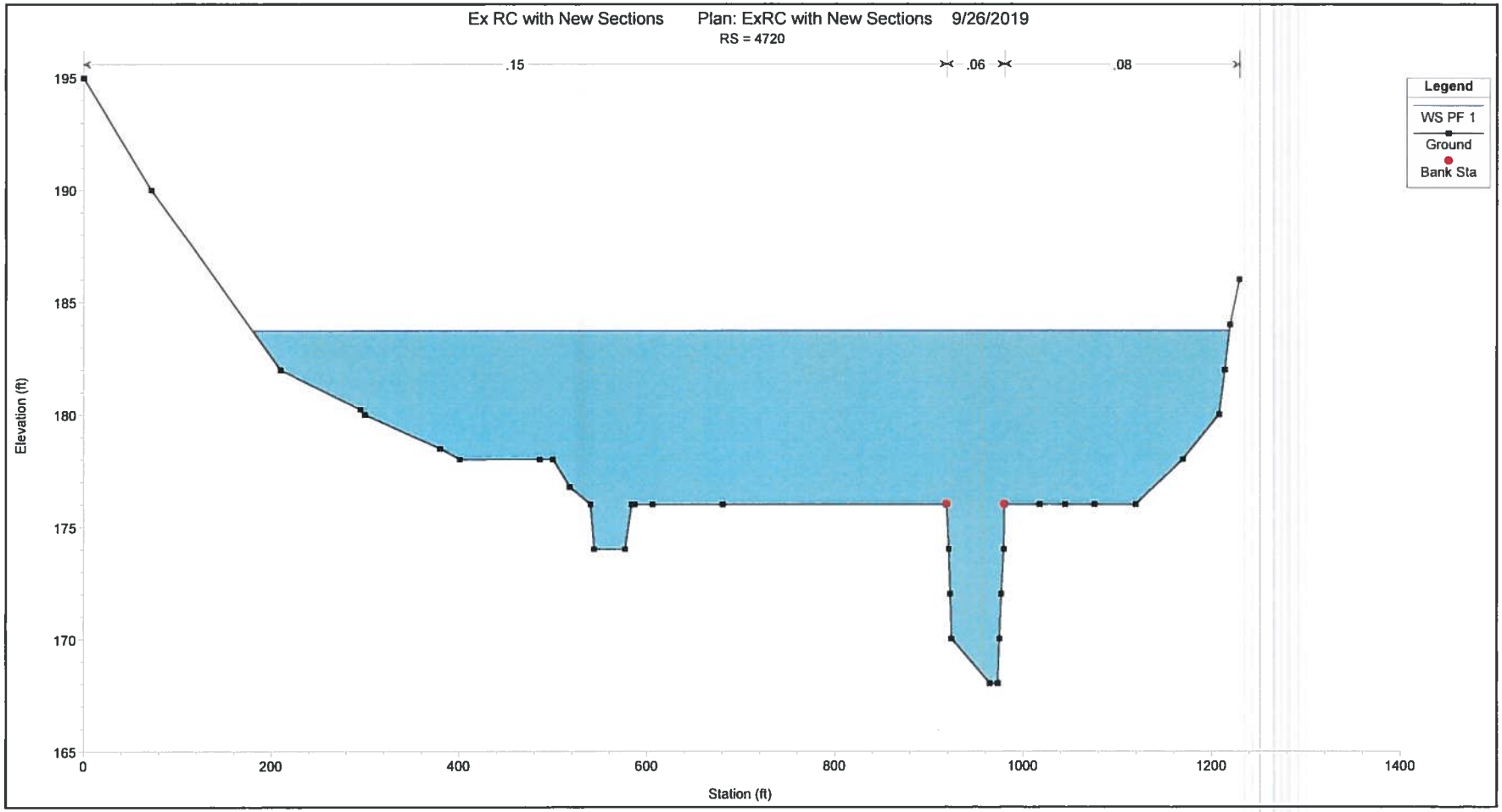
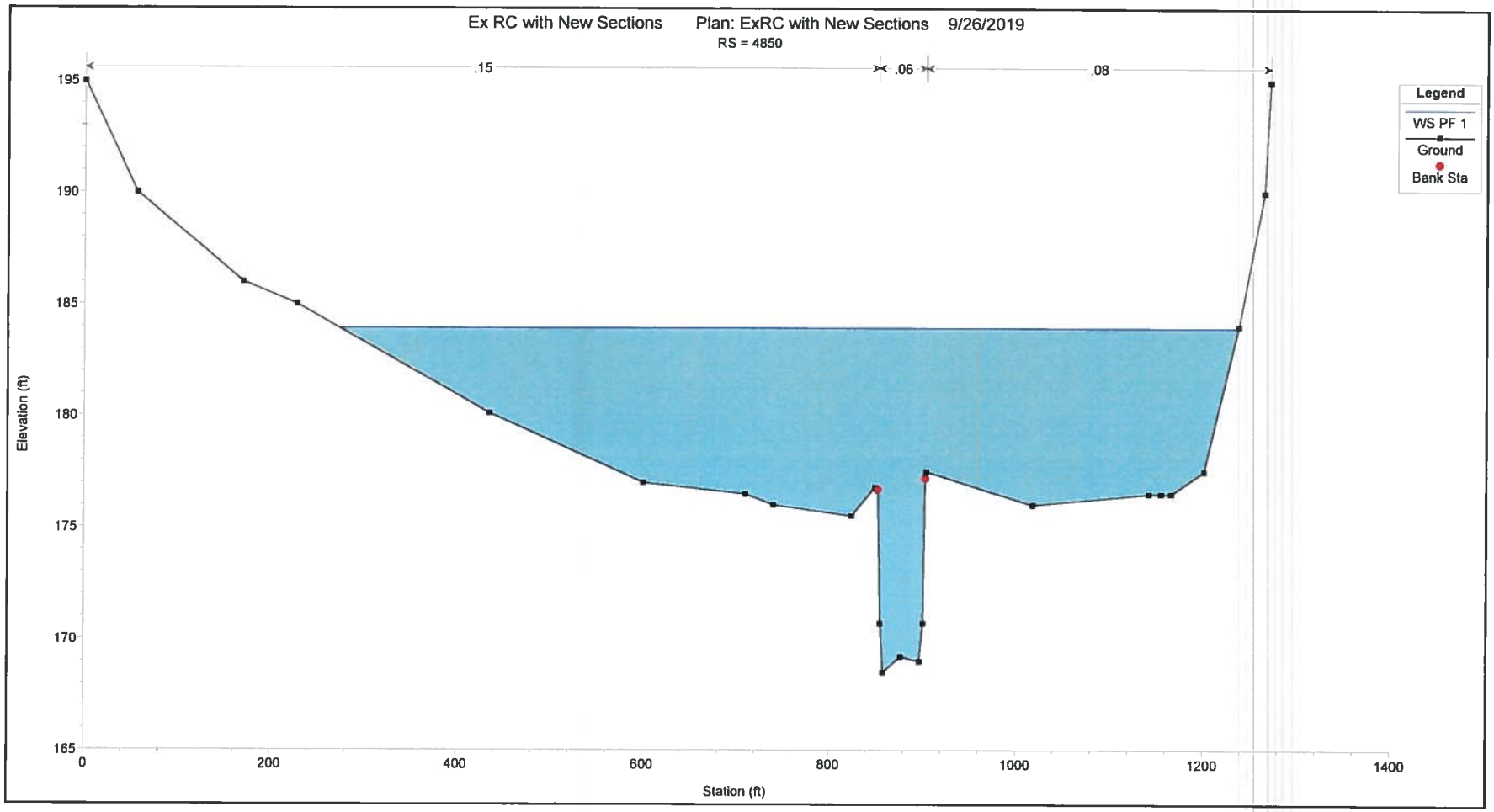
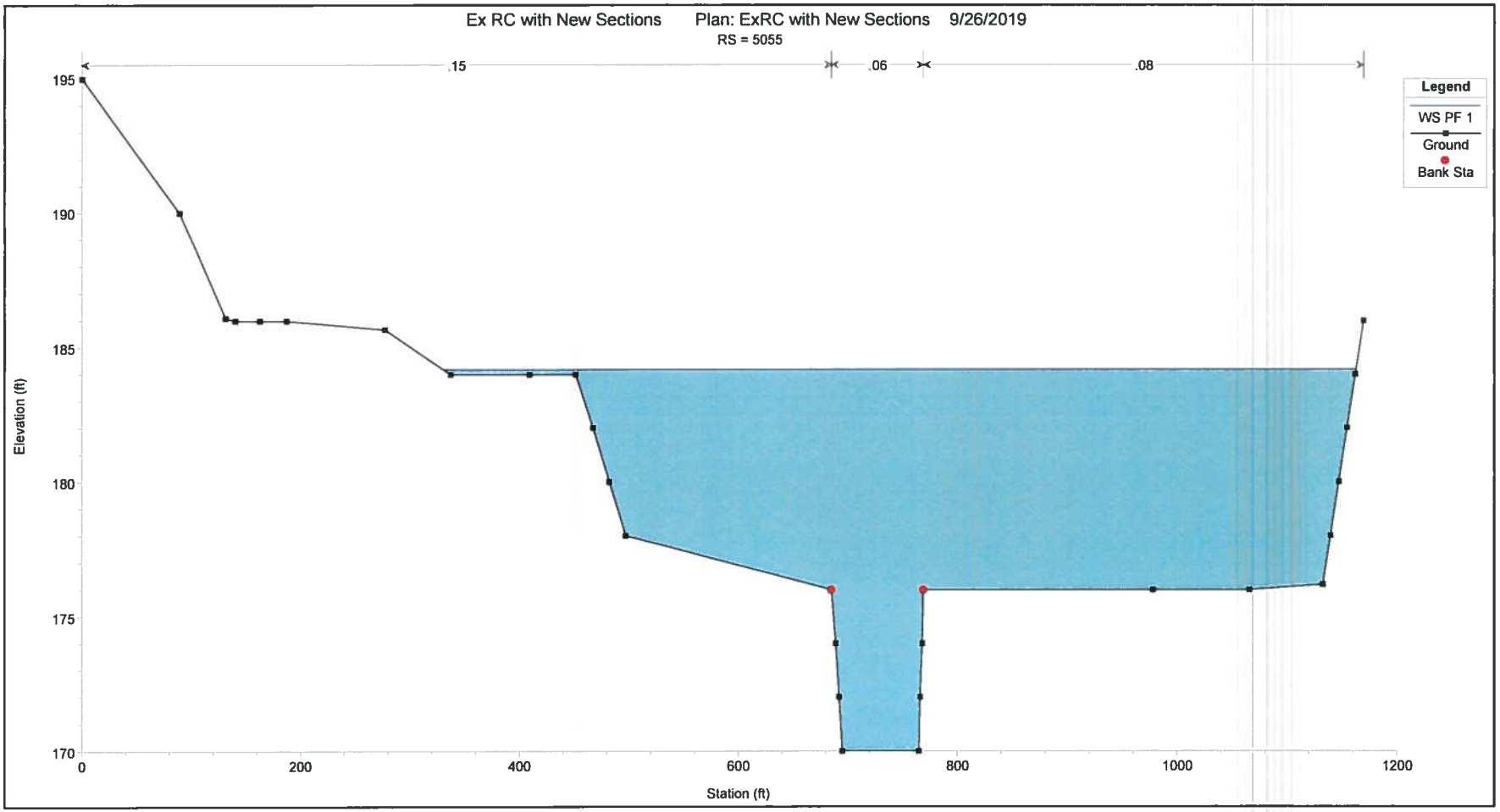
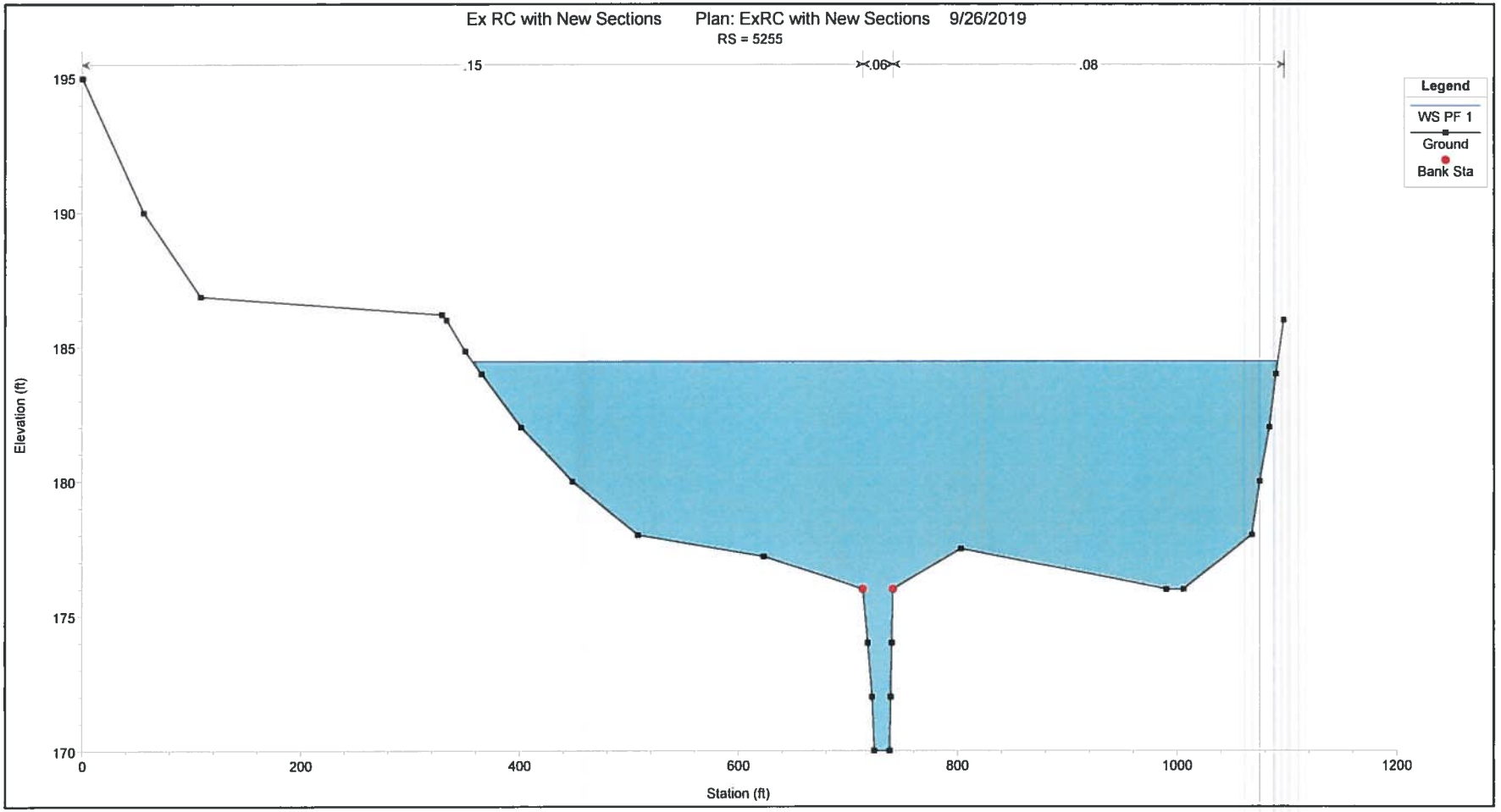
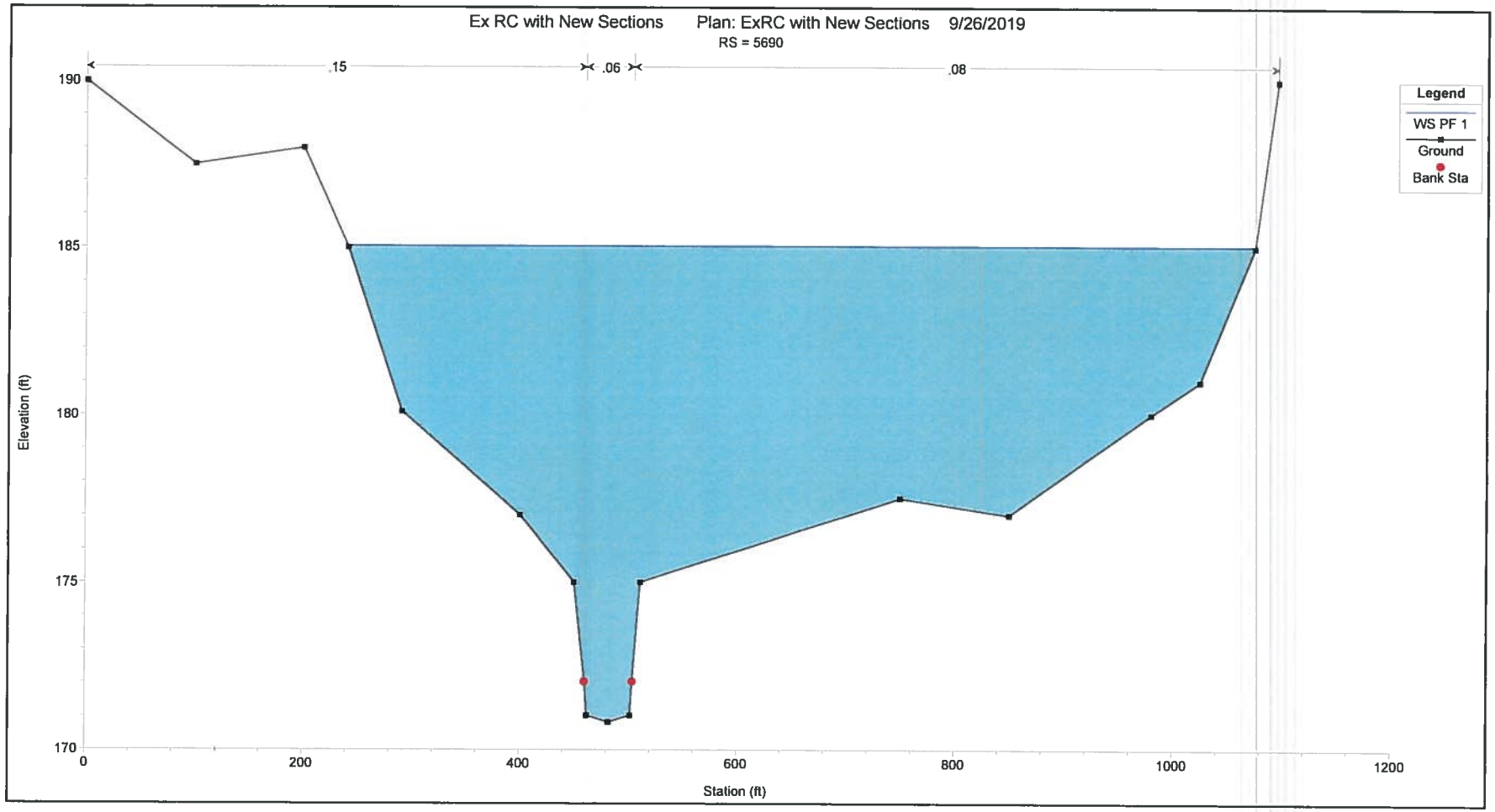
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)

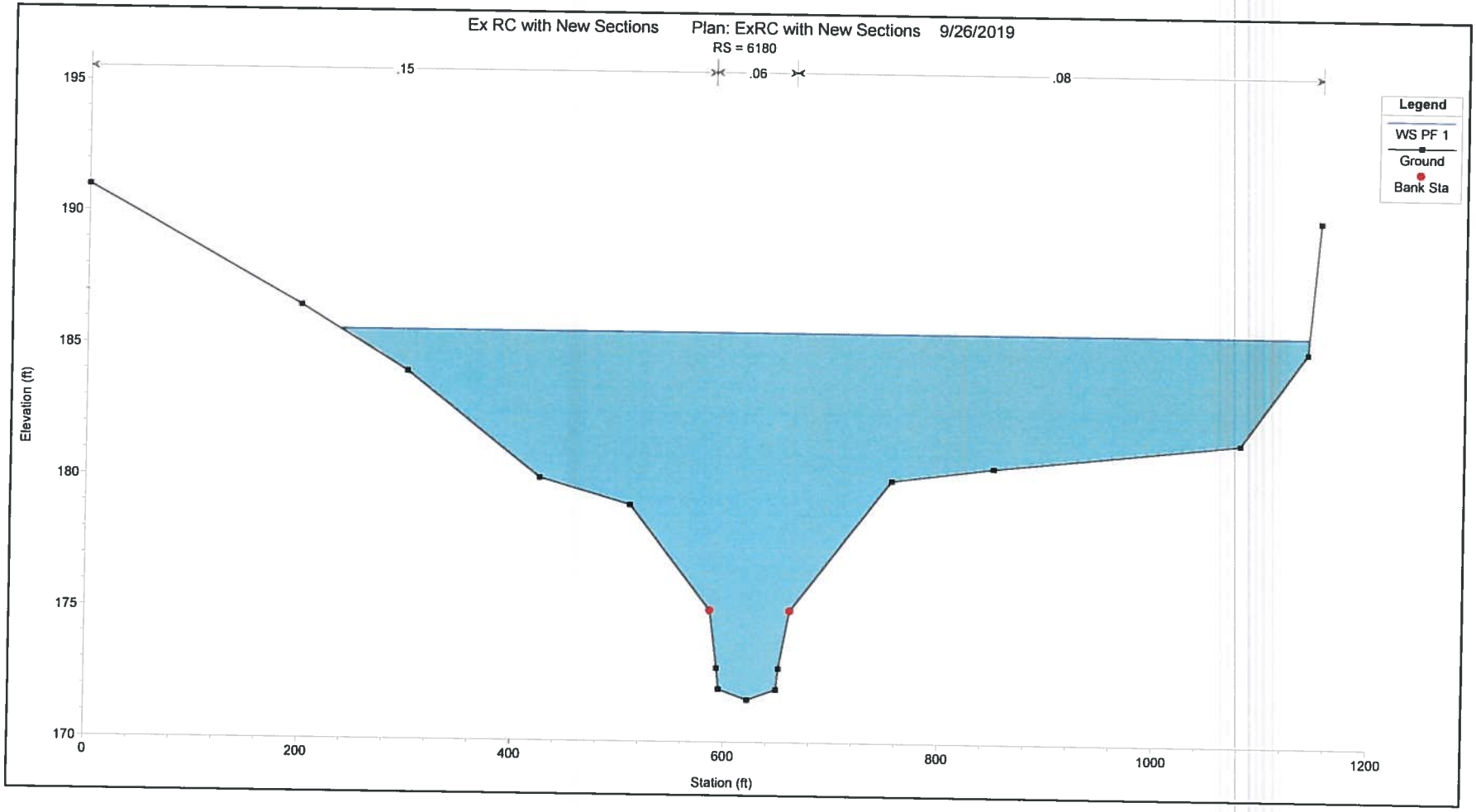

Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 4720
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)


Ex RC with New Sections
Plan: ExRC with New Sections 9/26/2019
RS = 4850
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)


Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 5055
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)

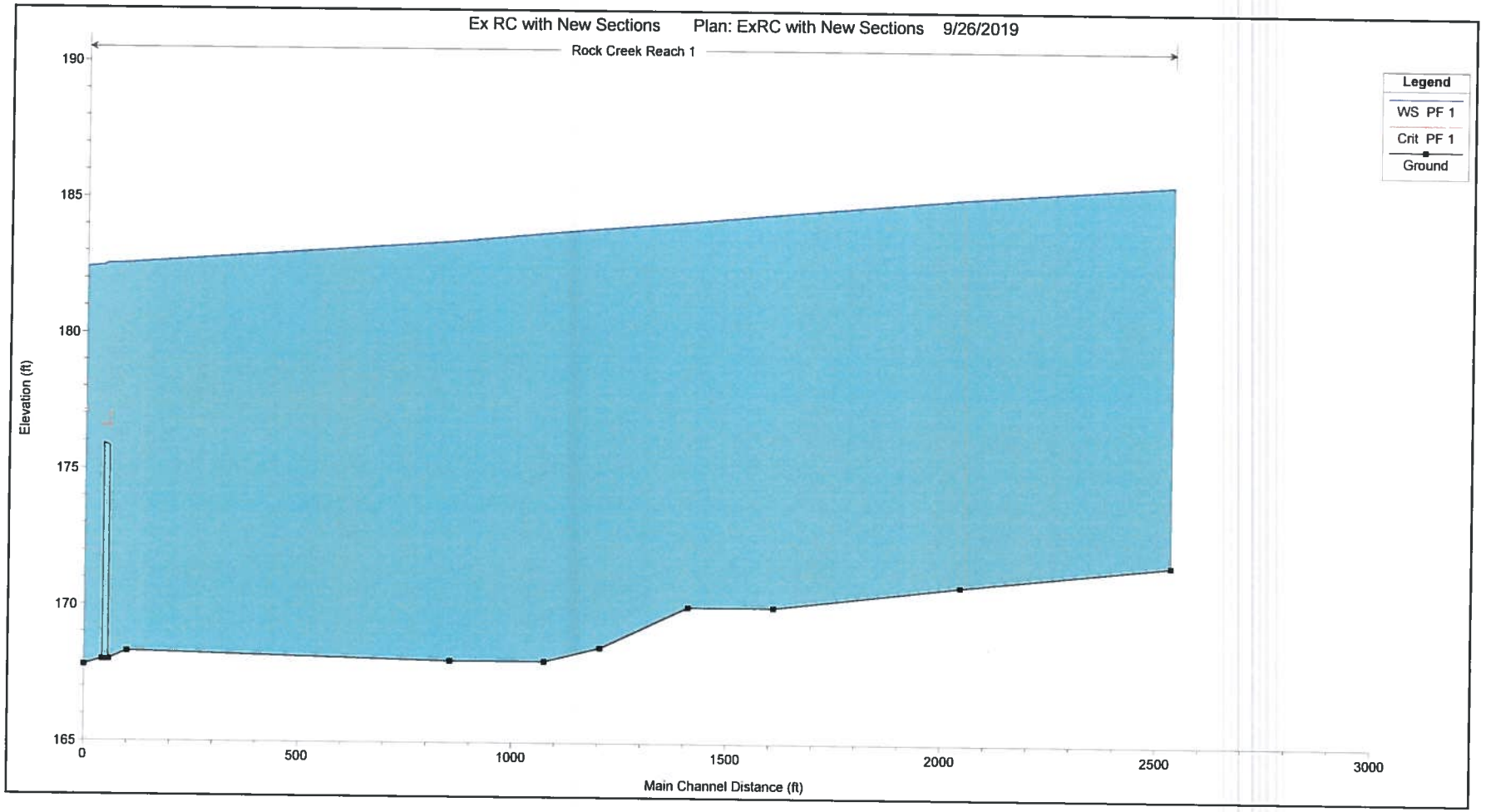

Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 5255
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)


Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
RS = 5690
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)


Ex RC with New Sections
Plan: ExRC with New Sections 9/26/2019
RS = 6180
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)

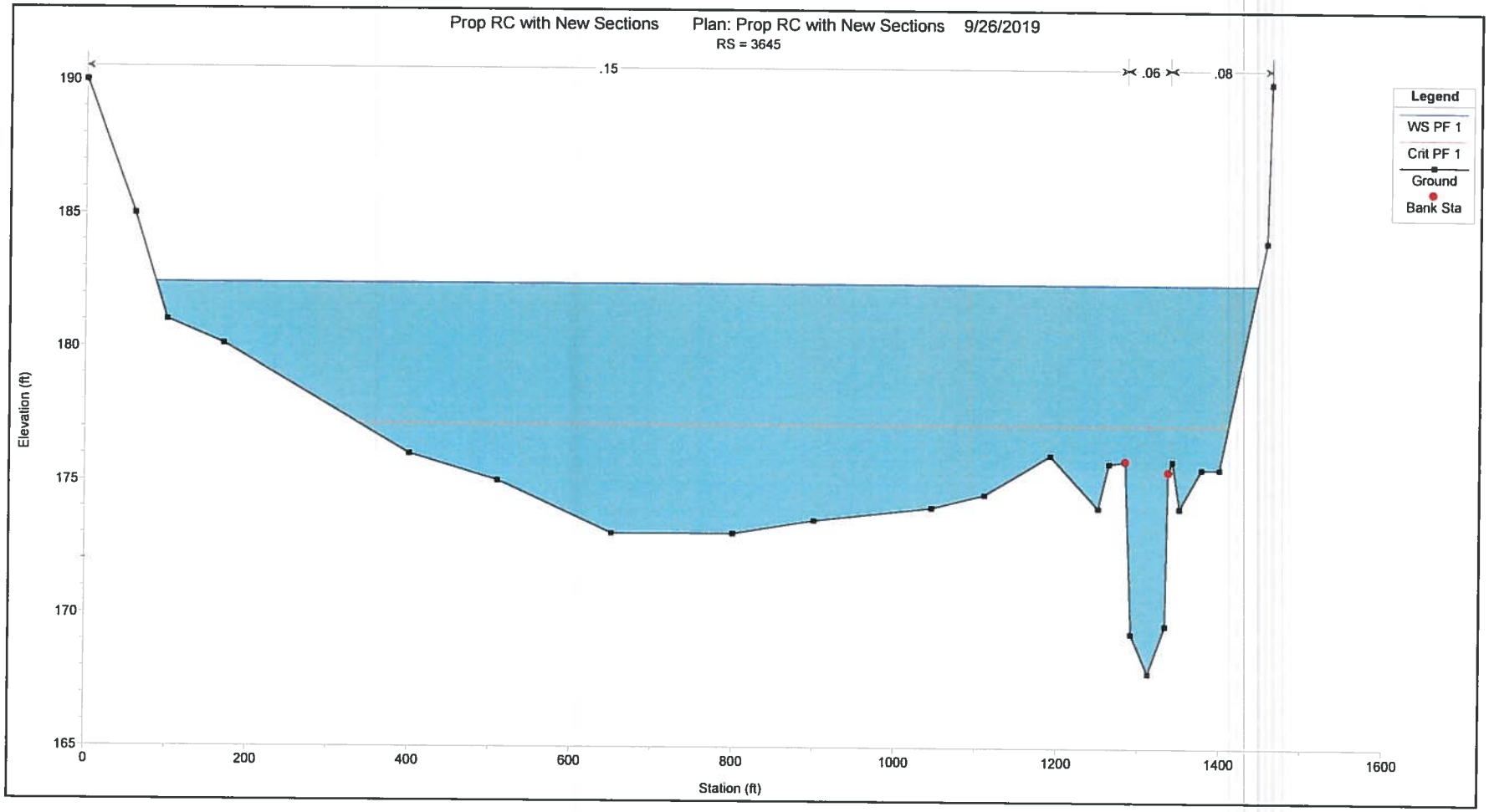
HEC-RAS Plan: ExRCwithNew River: Rock Creek Reach: Reach 1 Profile: PF 1

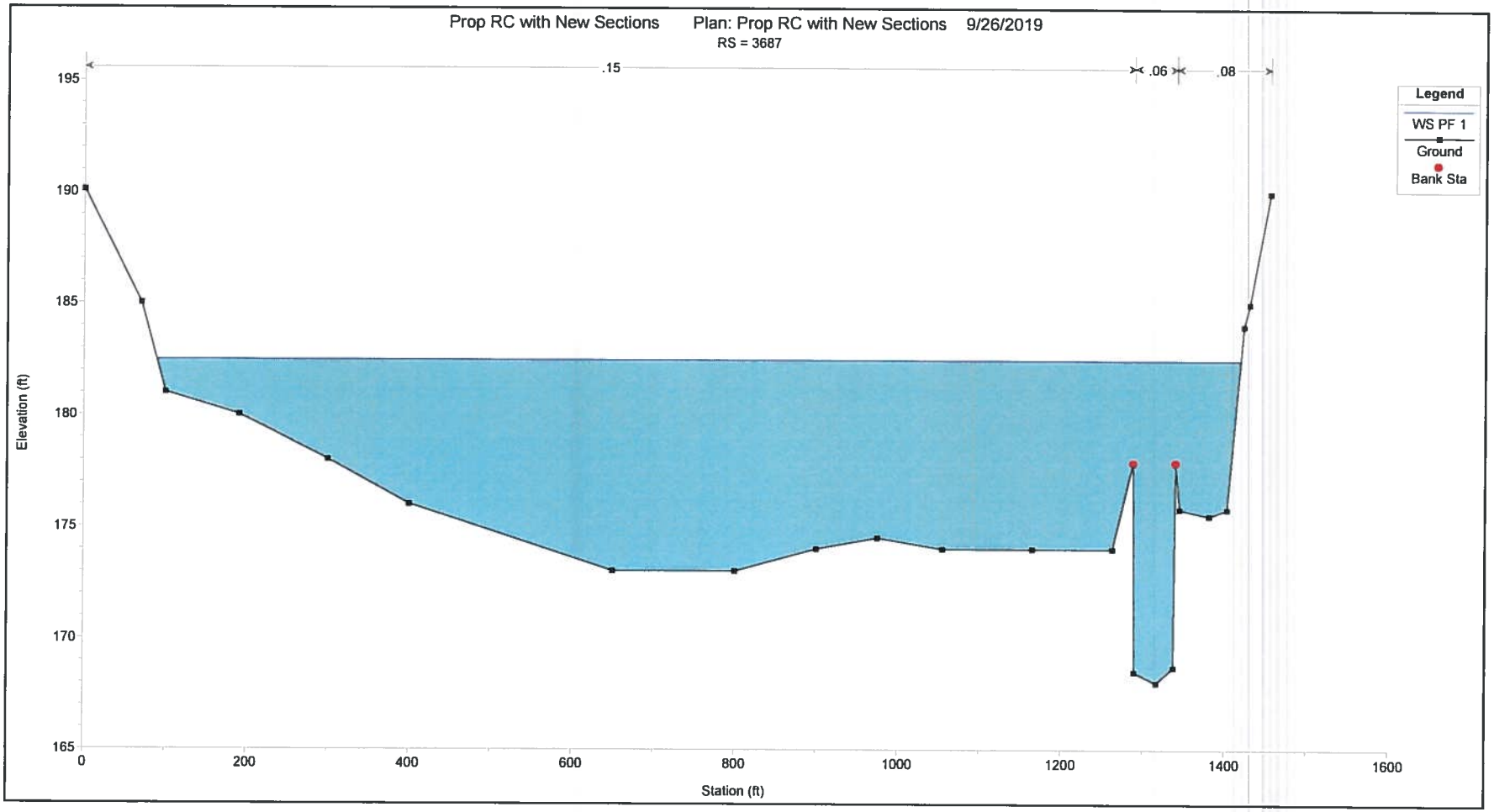
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Headloss	LOB Elev	ROB Elev
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)
Reach 1	3645	14000.00	167.80	182.42	177.12	182.49	0.001047	4.12	9765.92	1359.61	0.20		175.80	175.40
Reach 1	3687	14000.00	168.00	182.47		182.54	0.001042	3.88	9822.44	1330.34	0.18	0.05	177.90	177.90
Reach 1	3688	Bridge												
Reach 1	3702	14000.00	168.00	182.53	176.98	182.60	0.001016	3.85	9902.81	1330.94	0.18	0.03	177.90	177.90
Reach 1	3745	14000.00	168.30	182.57		182.66	0.001260	4.24	8813.29	1219.28	0.22	0.06	175.80	176.40
Reach 1	4500	14000.00	168.00	183.41		183.61	0.001217	5.35	7105.02	1096.67	0.24	0.96	168.00	168.00
Reach 1	4720	14000.00	168.00	183.75		183.91	0.001351	4.99	7101.34	1039.49	0.23	0.29	176.00	176.00
Reach 1	4850	14000.00	168.50	183.93		184.11	0.001630	5.27	6170.10	964.41	0.25	0.20	176.70	177.20
Reach 1	5055	14000.00	170.00	184.19		184.36	0.001097	4.51	5762.00	832.99	0.22	0.25	176.00	176.00
Reach 1	5255	14000.00	170.00	184.48		184.67	0.002315	5.79	5003.16	735.07	0.28	0.32	176.00	176.00
Reach 1	5690	14000.00	170.80	185.06		185.19	0.001096	4.75	6150.62	835.02	0.22	0.52	172.00	172.00
Reach 1	6180	14000.00	171.60	185.60		185.88	0.001903	6.01	5142.15	907.24	0.29	0.69	175.00	175.00

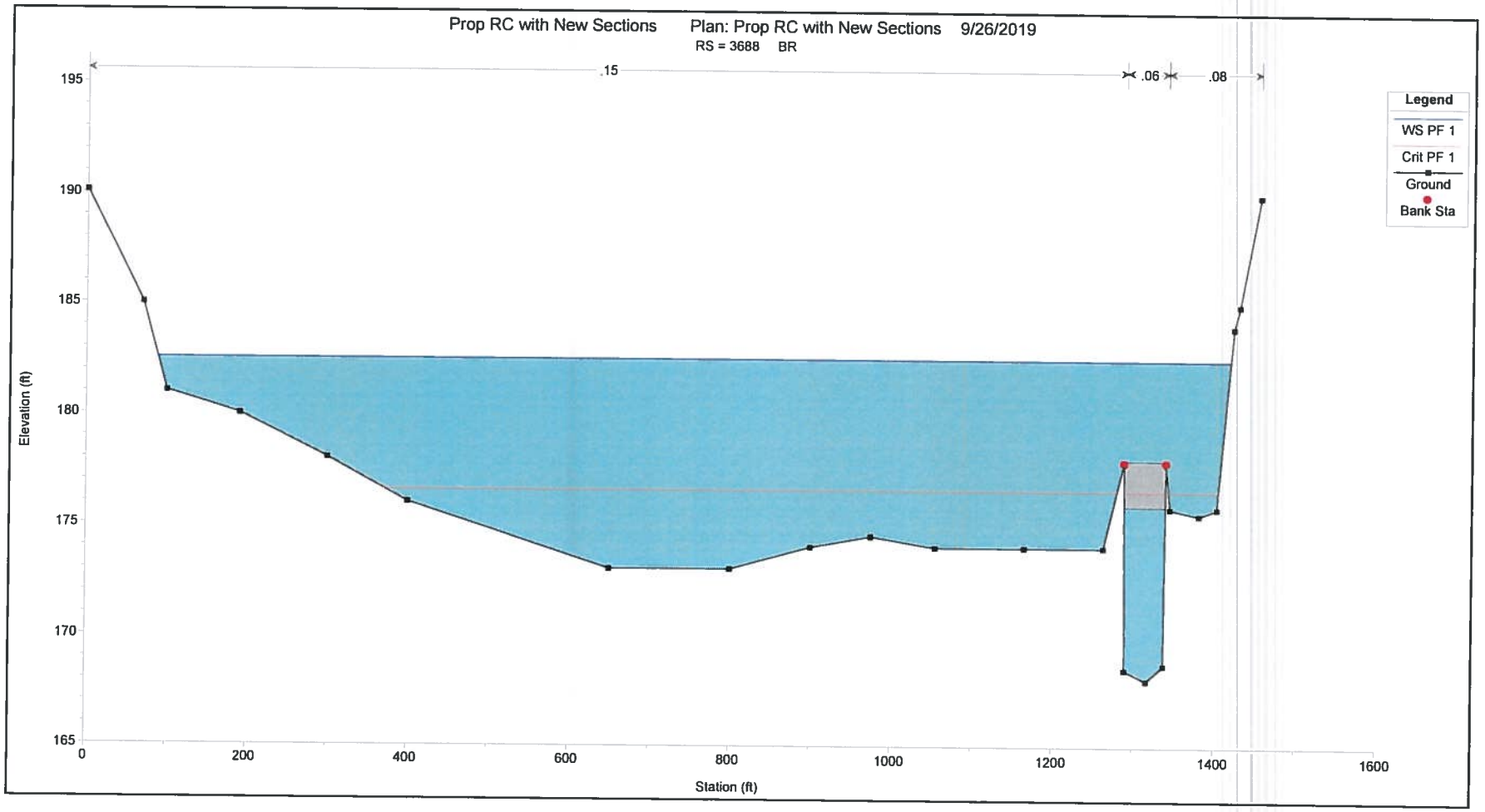

Ex RC with New Sections Plan: ExRC with New Sections 9/26/2019
Rock Creek Reach 1
Legend
WS PF 1
Crit PF 1
Ground
Elevation (ft)
190
185
180
175
170
165
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)

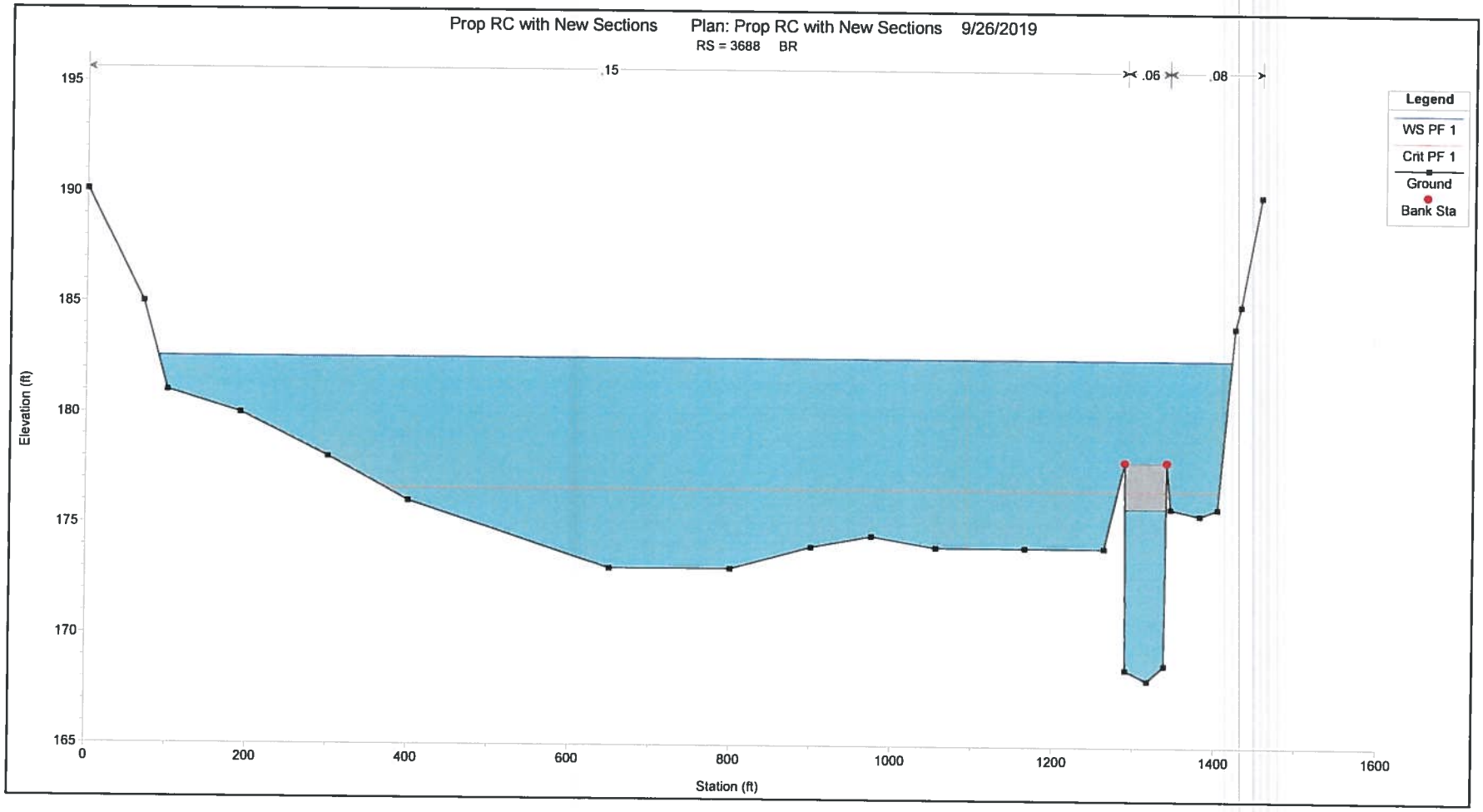
FLOODPLAIN ANALYSIS

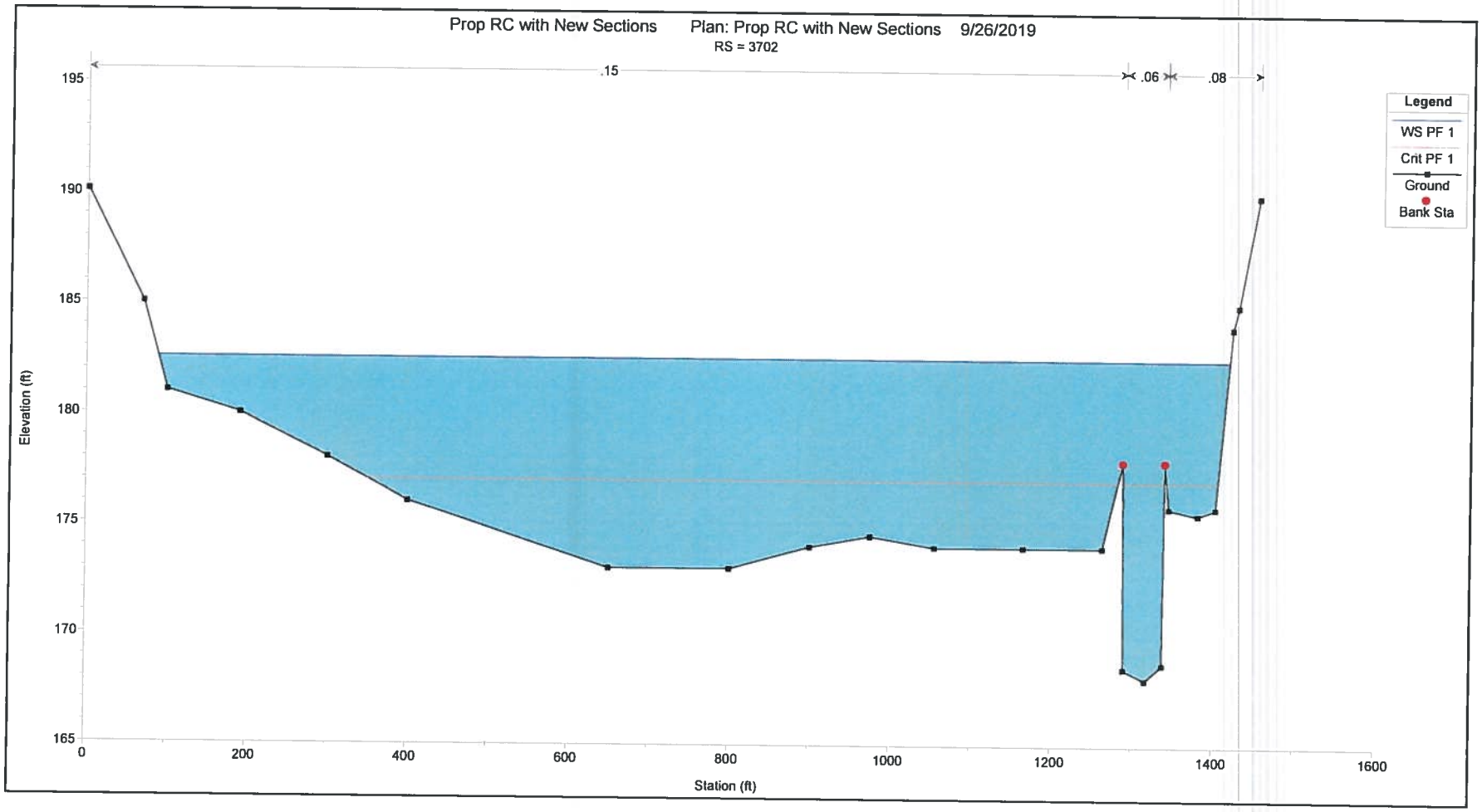
PROPOSED CHANNEL CONDITIONS WITH NEW SECTIONS INSERTED

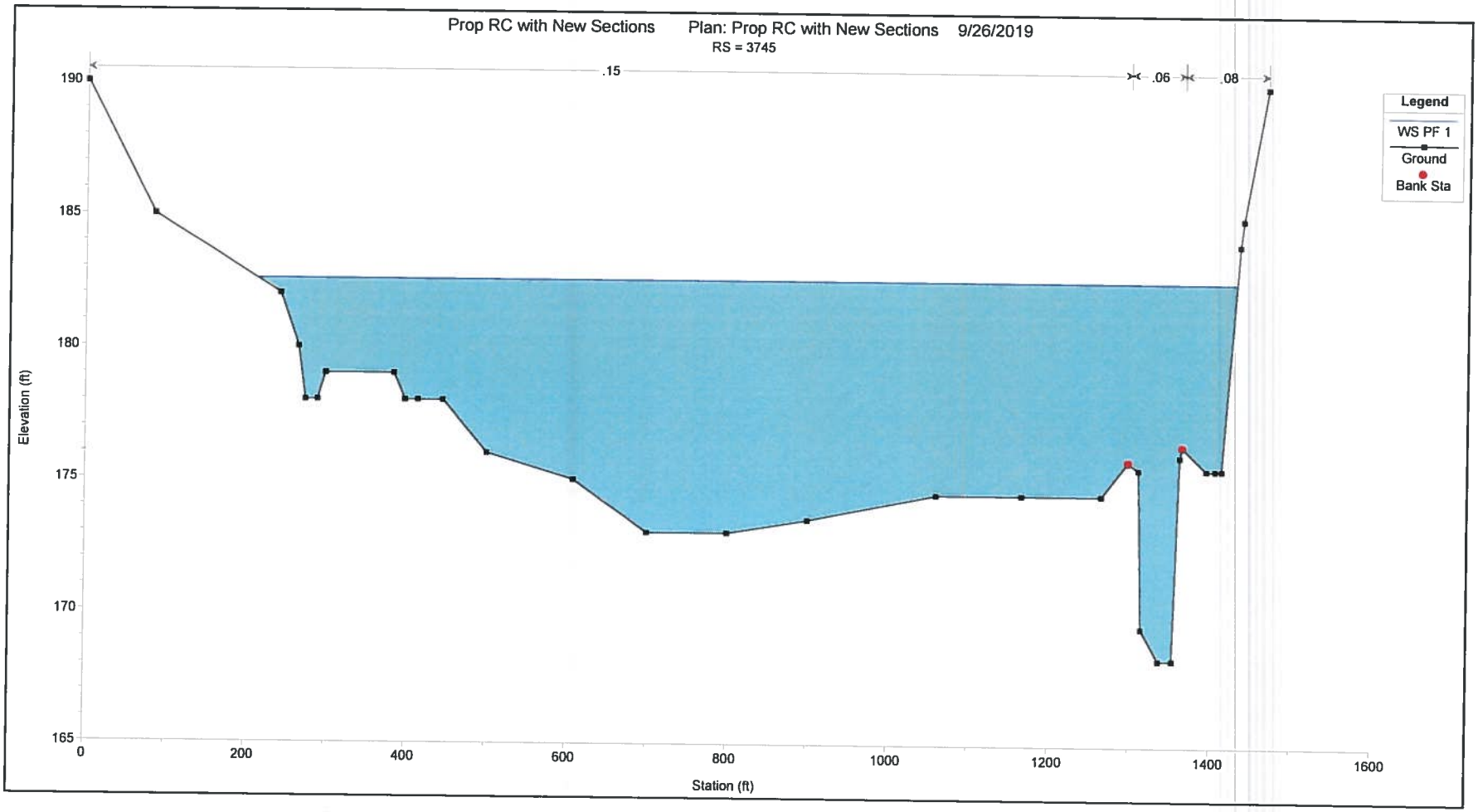

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 3645
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

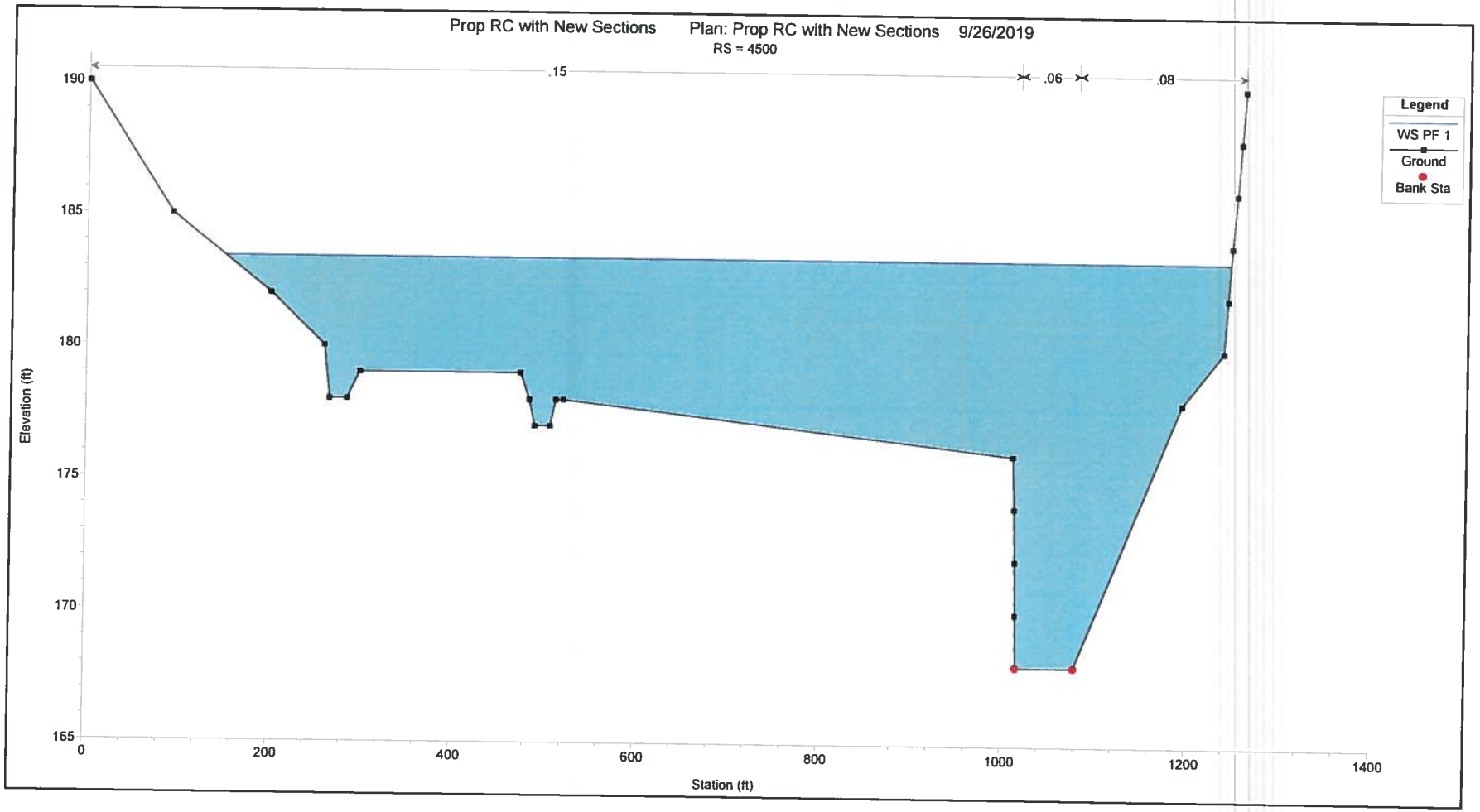

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 3687
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

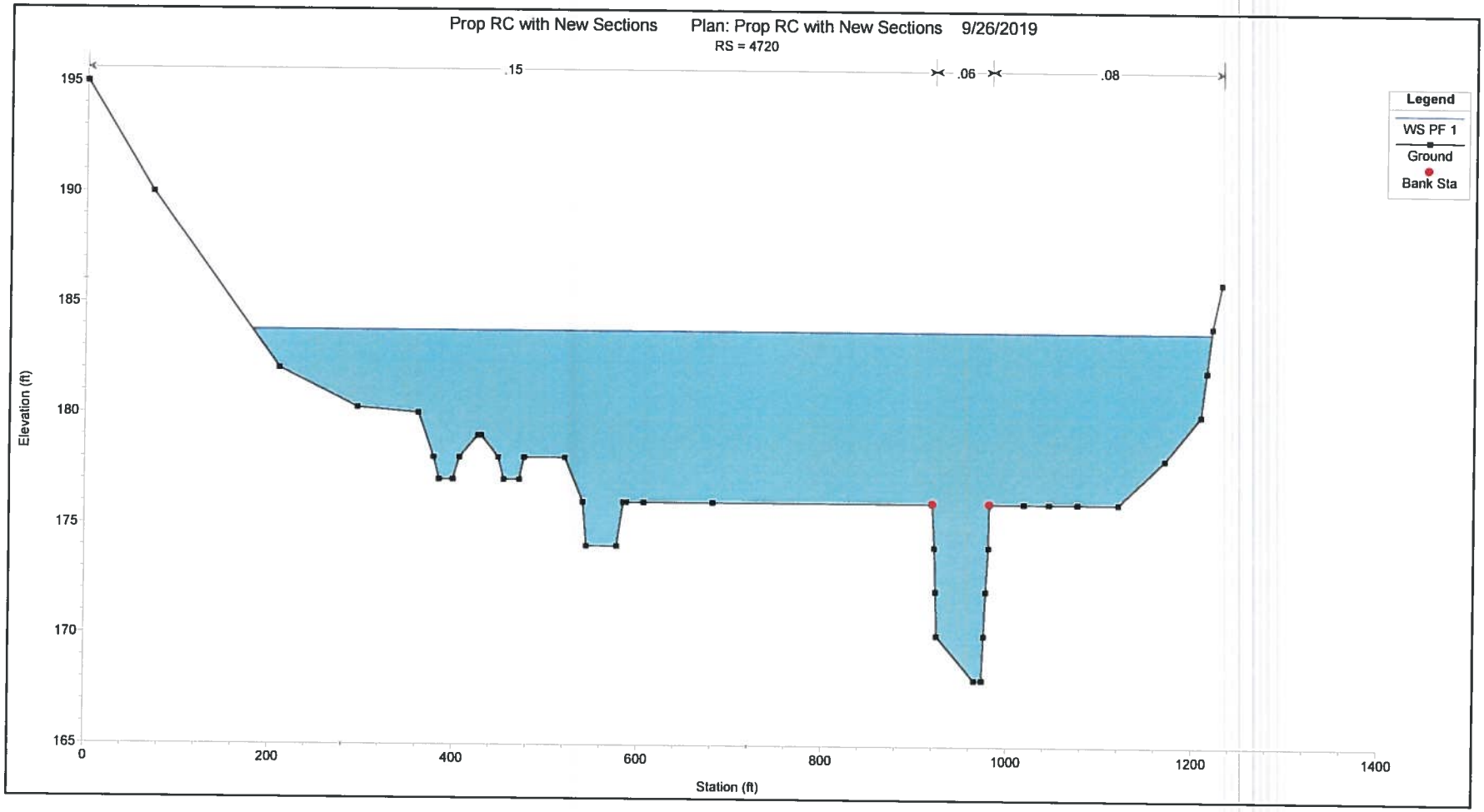

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 3688 BR
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

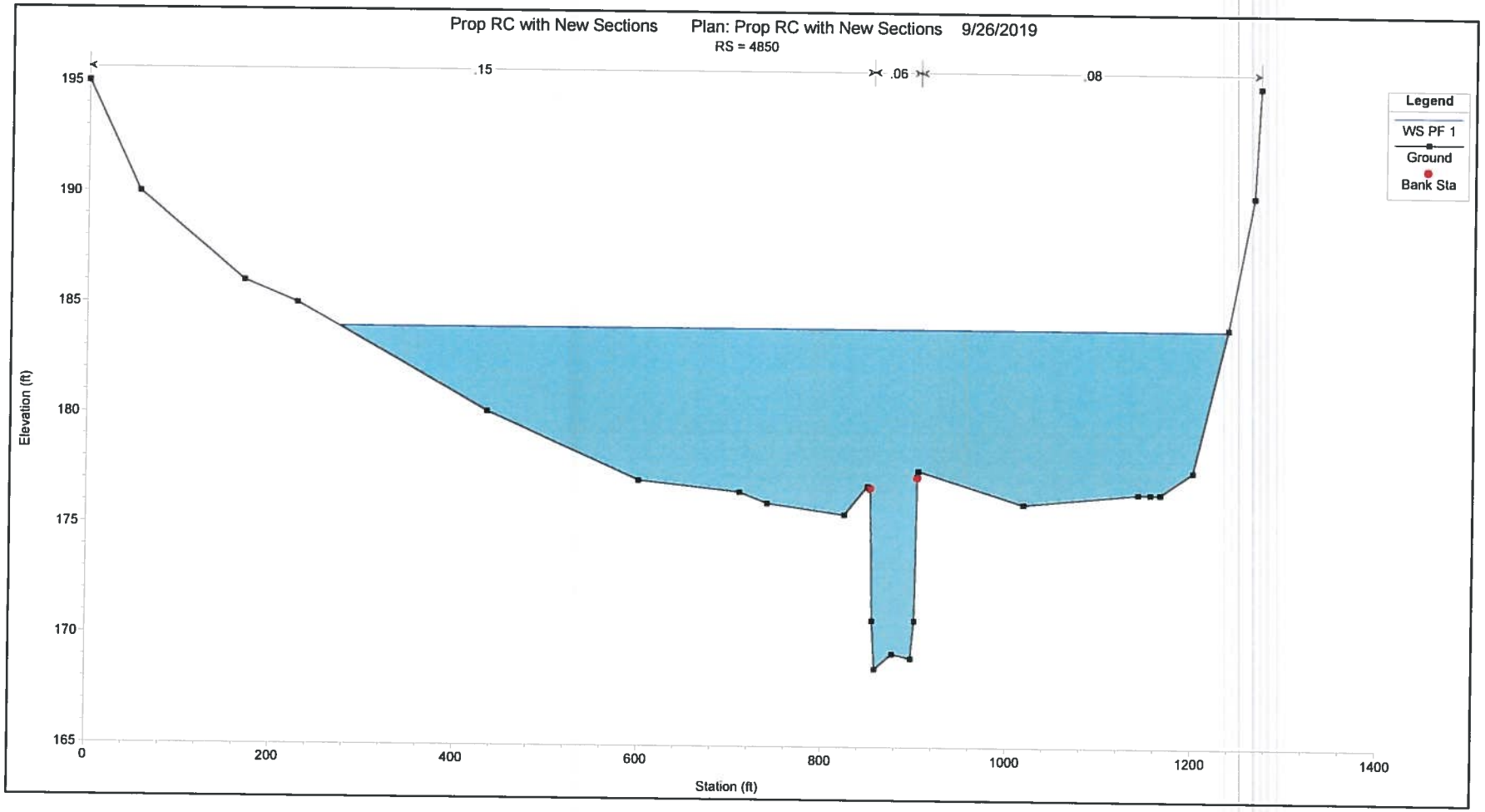

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 3688 BR
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

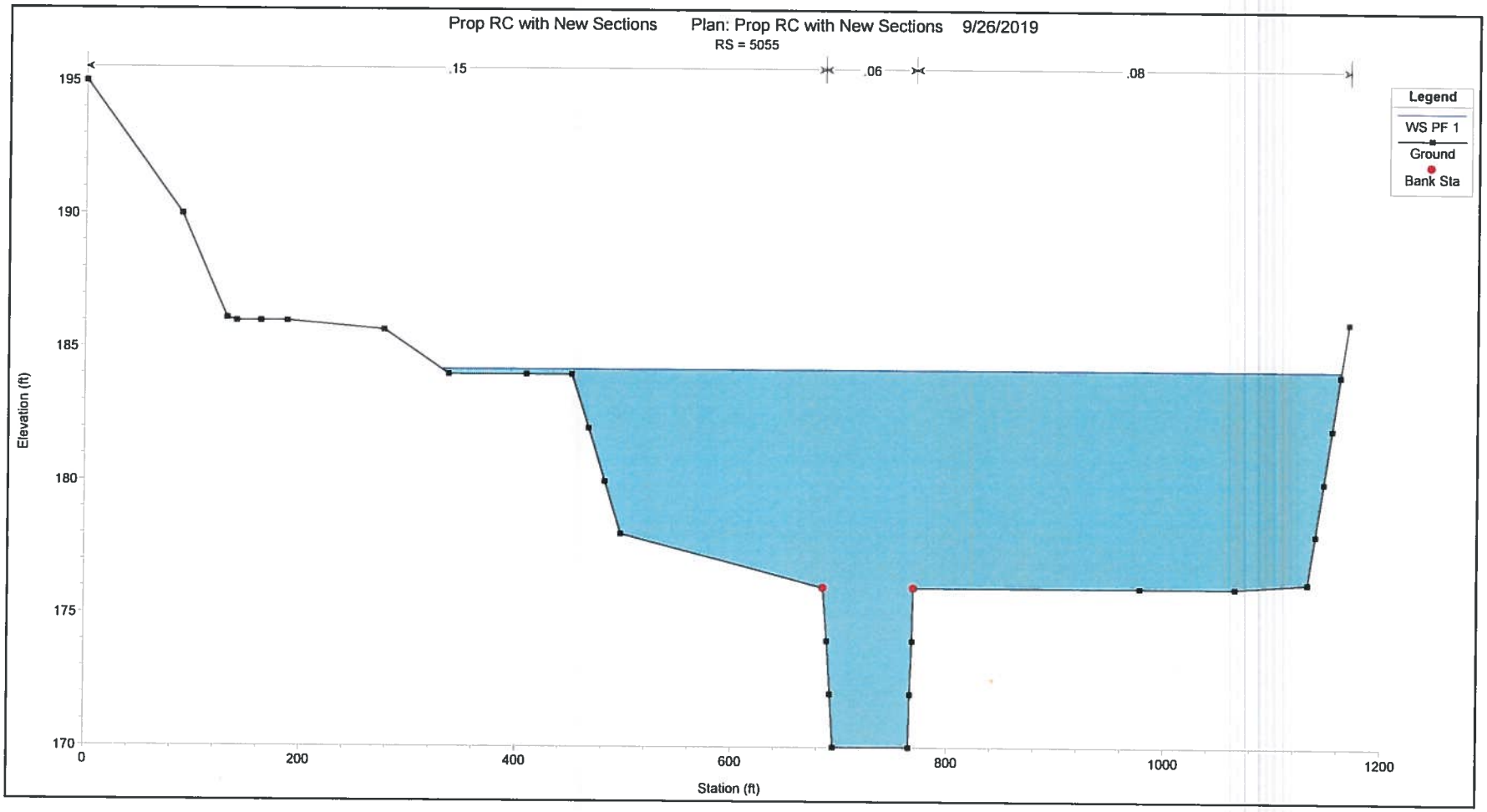

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 3702
.15
.06
.08
Legend
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

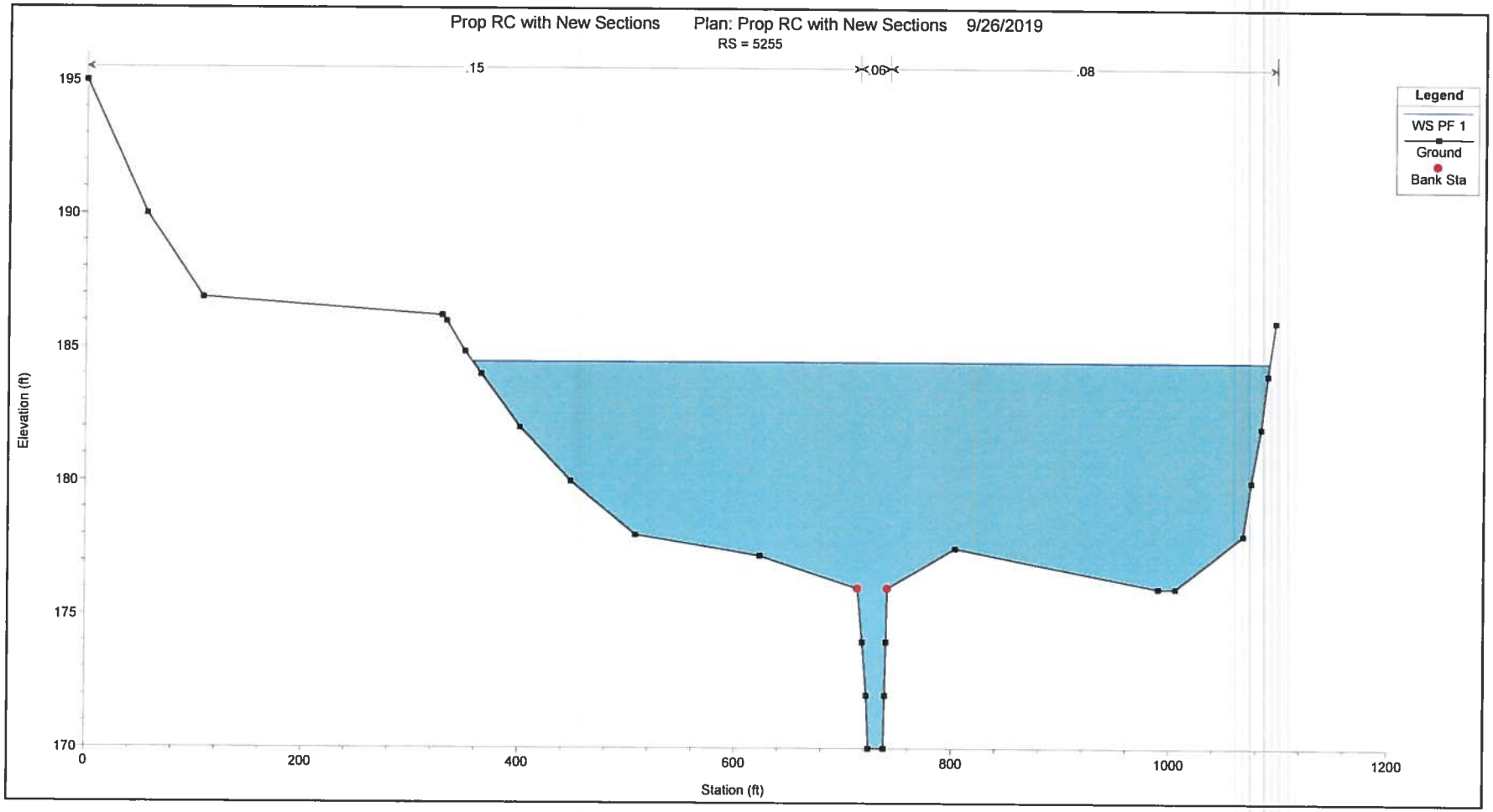

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 3745
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

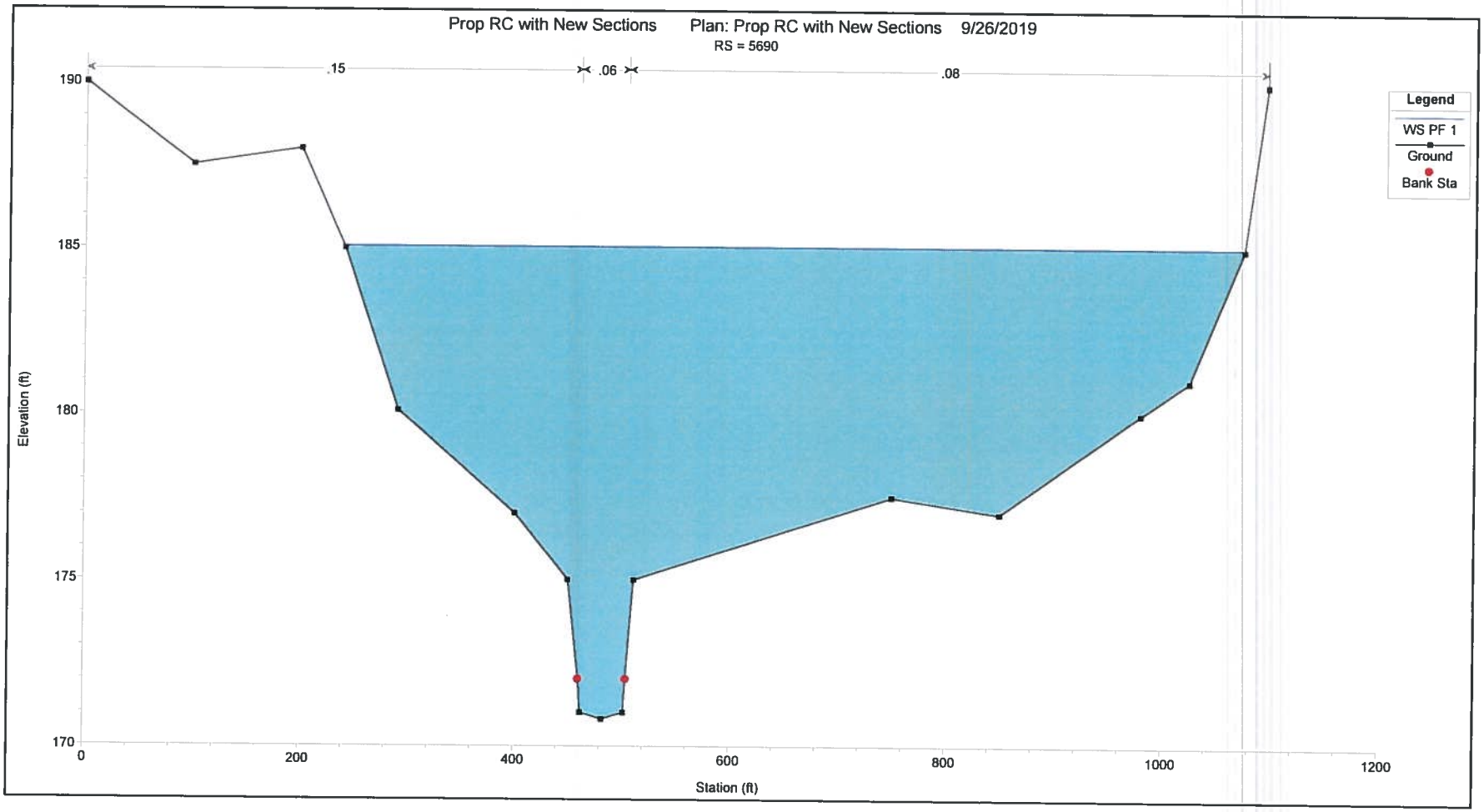

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 4500
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)

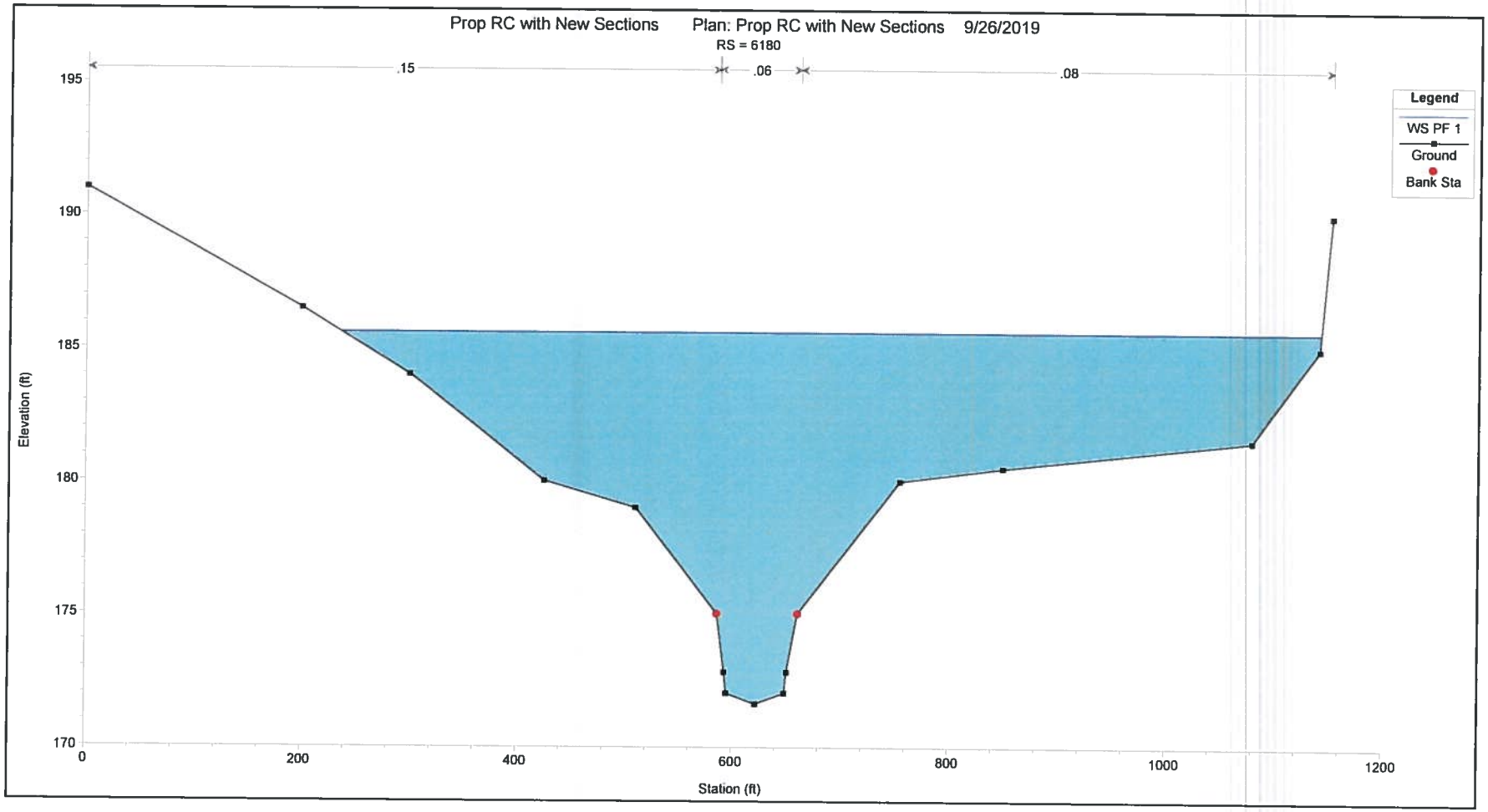

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 4720
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)


Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 4850
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
165
0
200
400
600
800
1000
1200
1400
Station (ft)


Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 5055
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)

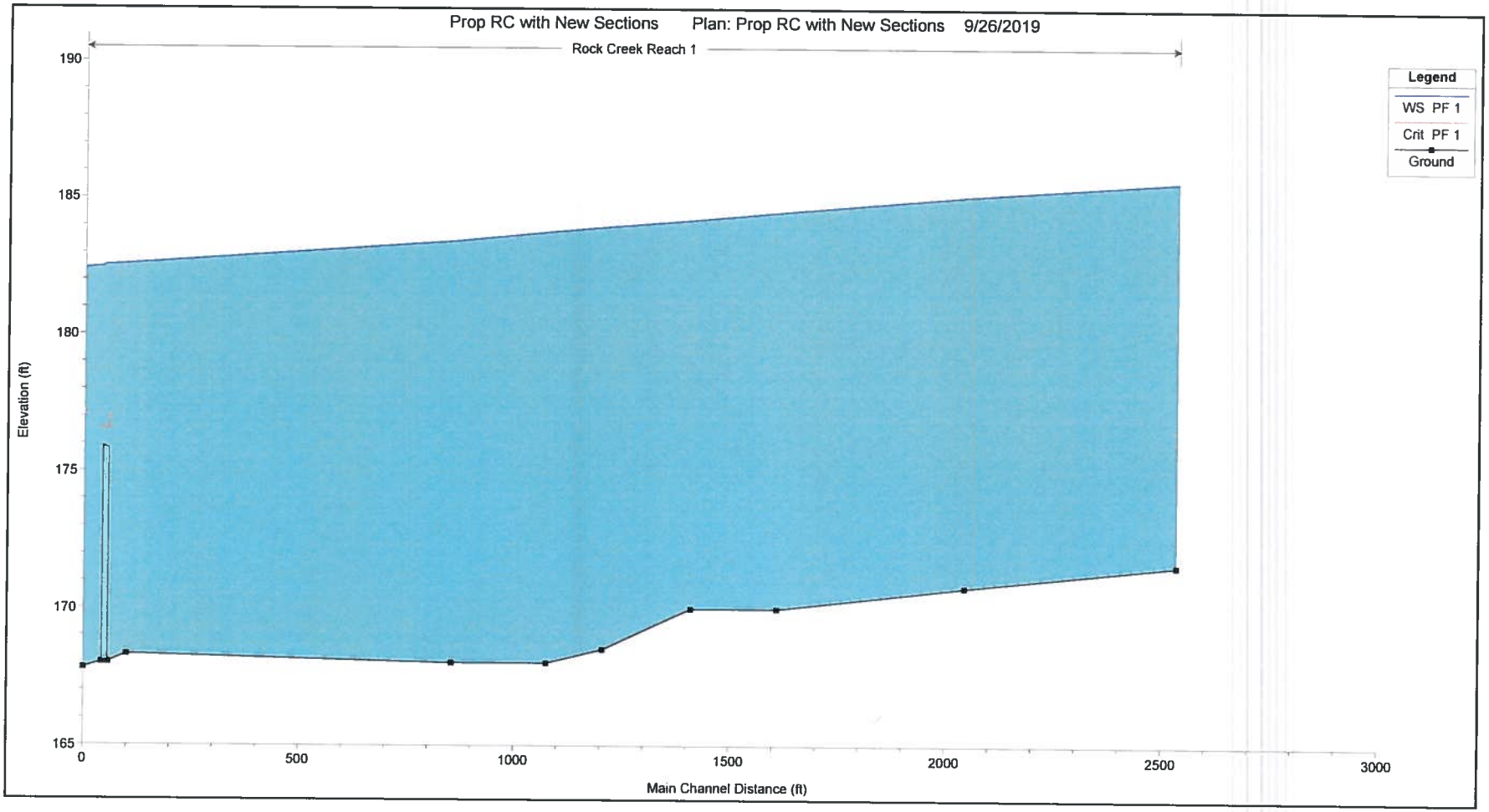

Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 5255
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)


Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 5690
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)


Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
RS = 6180
.15
.06
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
195
190
185
180
175
170
0
200
400
600
800
1000
1200
Station (ft)

HEC-RAS Plan: PropRCwithNew River: Rock Creek Reach: Reach 1 Profile: PF 1

Reach	River Sta	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	Headloss	LOB Elev	ROB Elev
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)
Reach 1	3645	14000.00	167.80	182.42	177.12	182.49	0.001047	4.12	9765.92	1359.61	0.20		175.80	175.40
Reach 1	3687	14000.00	168.00	182.47		182.54	0.001042	3.88	9822.44	1330.34	0.18	0.05	177.90	177.90
Reach 1	3688	Bridge												
Reach 1	3702	14000.00	168.00	182.53	176.98	182.60	0.001016	3.85	9902.81	1330.94	0.18	0.03	177.90	177.90
Reach 1	3745	14000.00	168.30	182.57		182.66	0.001209	4.15	8951.33	1219.37	0.21	0.05	175.80	176.40
Reach 1	4500	14000.00	168.00	183.40		183.61	0.001255	5.43	6990.47	1096.27	0.24	0.96	168.00	168.00
Reach 1	4720	14000.00	168.00	183.75		183.91	0.001369	5.02	7057.05	1039.54	0.23	0.30	176.00	176.00
Reach 1	4850	14000.00	168.50	183.94		184.11	0.001626	5.26	6175.55	964.68	0.24	0.20	176.70	177.20
Reach 1	5055	14000.00	170.00	184.19		184.36	0.001095	4.51	5766.19	833.19	0.21	0.25	176.00	176.00
Reach 1	5255	14000.00	170.00	184.48		184.68	0.002311	5.78	5006.43	735.17	0.28	0.32	176.00	176.00
Reach 1	5690	14000.00	170.80	185.06		185.19	0.001094	4.75	6153.51	835.09	0.22	0.51	172.00	172.00
Reach 1	6180	14000.00	171.60	185.60		185.88	0.001901	6.01	5144.62	907.35	0.29	0.69	175.00	175.00


Prop RC with New Sections
Plan: Prop RC with New Sections 9/26/2019
Rock Creek Reach 1
Legend
WS PF 1
Crit PF 1
Ground
Elevation (ft)
190
185
180
175
170
165
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
AUTHORIZATION TO PROCEED

AUTHORIZATION NUMBER: 202060059/20-NT-3009

EFFECTIVE DATE: January 28, 2020

EXPIRATION DATE: January 28, 2025

AUTHORIZED PERSON: Maryland National Capital Park & Planning Commission
(MNCPPC)
9500 Brunett Ave
Silver Spring, Maryland 20901
Attn:Erin McArdle

IN ACCORDANCE WITH ENVIRONMENT ARTICLE §5-503(a) AND §5-906(b), ANNOTATED CODE OF MARYLAND (2007 REPLACEMENT VOLUME), COMAR 26.17.04 AND 26.23.01, AND 26.08.02 AND THE ATTACHED CONDITIONS OF AUTHORIZATIONS, Maryland National Capital Park & Planning Commission (MNCPPC) ("AUTHORIZED PERSON"), IS HEREBY AUTHORIZED BY THE WATER AND SCIENCE ADMINISTRATION ("ADMINISTRATION") TO CONDUCT A REGULATED ACTIVITY IN A NONTIDAL WETLAND, BUFFER, OR EXPANDED BUFFER, AND/OR TO CHANGE THE COURSE, CURRENT OR CROSS-SECTION OF WATERS OF THE STATE, IN ACCORDANCE WITH THE ATTACHED PLANS APPROVED BY THE ADMINISTRATION ON January 28, 2020 ("APPROVED PLAN") AND PREPARED BY GLW AND INCORPORATED HEREIN, AS DESCRIBED BELOW:

The project involves the construction of a nonhabitable covered pavilion style horse riding arena and minor grading within the 100-year nontidal floodplain of Rock Creek. The project will result in permanent impact to 1,000 square feet and temporary impact to 57,000 square feet of 100-year nontidal floodplain of Rock Creek. The project location is 8200 Meadowbrook Lane, Chevy Chase in Montgomery County.

MD Grid Coordinates 146805 x 394761

Denise M. Keehner
Program Manager
Wetlands and Waterways Program

Attachments: Conditions of Authorization & BMPs
Approved Plans

cc: WSA Compliance Division w/ file
Katrina Weineg, Meadowbrook Foundation, Inc.

1. **Validity:** Authorization is valid only for use by Authorized Person. Authorization may be transferred only with prior written approval of the Administration. In the event of transfer, transferee agrees to comply with all terms and conditions of Authorization.
2. **Initiation of Work, Modifications and Extension of Term**: Authorized Person shall initiate authorized activities with two (2) years of the Effective Date of this Authorization or the Authorization shall expire. Authorized Person may submit written requests to the Administration for (a) extension of the period for initiation of work, (b) modification of Authorization, including the Approved Plan, or, (c) not later than 45 days prior to Expiration Date, an extension of the term. Requests for modification shall be in accordance with applicable regulations and shall state reasons for changes, and shall indicate the impacts on nontidal wetlands, streams, and the floodplain, as applicable. The Administration may grant a request at its sole discretion.
3. **Responsibility and Compliance**: Authorized Person is fully responsible for all work performed and activities authorized by this Authorization shall be performed in compliance with this Authorization and Approved Plan. Authorized Person agrees that a copy of the Authorization and Approved Plan shall be kept at the construction site and provided to its employees, agents and contractors. A person (including Authorized Person, its employees, agents or contractors) who violates or fails to comply with the terms and conditions of this Authorization, Approved Plan or an administrative order may be subject to penalties in accordance with §5-514 and §5-911, Department of the Environment Article, Annotated Code of Maryland (2007 Replacement Volume).
4. **Failure to Comply**: If Authorized Person, its employees, agents or contractors fail to comply with this Authorization or Approved Plan, the Administration may, in its discretion, issue an administrative order requiring Authorized Person, its employees, agents and contractors to cease and desist any activities which violate this Authorization, or the Administration may take any other enforcement action available to it by law, including filing civil or criminal charges.
5. **Suspension or Revocation**: Authorization may be suspended or revoked by the Administration, after notice of opportunity for a hearing, if Authorized Person: (a) submits false or inaccurate information in Permit application or subsequently required submittals; (b) deviates from the Approved Plan, specifications, terms and conditions; (c) violates, or is about to violate terms and conditions of this Authorization; (d) violates, or is about to violate, any regulation promulgated pursuant to Title 5, Department of the Environment Article, Annotated Code of Maryland as amended; (e) fails to allow authorized representatives of the Administration to enter the site of authorized activities at any reasonable time to conduct inspections and evaluations; (f) fails to comply with the requirements of an administrative action or order issued by the Administration; or (g) does not have vested rights under this Authorization and new information, changes in site conditions, or amended regulatory requirements necessitate revocation or suspension.
6. **Other Approvals**: Authorization does not authorize any injury to private property, any invasion of rights, or any infringement of federal, State or local laws or regulations, nor does it obviate the need to obtain required authorizations or approvals from other State, federal or local agencies as required by law.
7. **Site Access:** Authorized Person shall allow authorized representatives of the Administration access to the site of authorized activities during normal business hours to conduct inspections and evaluations necessary to assure compliance with this Authorization. Authorized Person shall provide necessary assistance to effectively and safely conduct such inspections and evaluations.
8. **Inspection Notification:** Authorized Person shall notify the Administration's Compliance Program at least five (5) days before starting authorized activities and five (5) days after completion. For Allegany, Garrett, and Washington counties, Authorized Person shall call 301-689-1480. For Carroll, Frederick, Howard, Montgomery, and Prince George's counties, Authorized Person shall call 301-665-2850. For Baltimore City, Anne Arundel, Baltimore, Harford, Calvert, Charles, and St. Mary's, Authorized Person shall call 410-537-3510. For Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico and Worcester, Authorized Person shall call 410-901-4020. If Authorization is for a project that is part of a mining site, please contact the Land and Materials Administration's Mining Program at 410-537-3557 at least five (5) days before starting authorized activities and five (5) days after completion.
9. **Sediment Control:** Authorized Person shall obtain approval from the Montgomery Soil Conservation District for a grading and sediment control plan specifying soil erosion control measures. The approved grading and sediment control plan shall be included in the Approved Plan, and shall be available at the construction site.

10. **Best Management Practices During Construction:** Authorized Person, its employees, agents and contractors shall conduct authorized activities in a manner consistent with the Best Management Practices specified by the Administration.
11. **Disposal of Excess:** Unless otherwise shown on the Approved Plan, all excess fill, spoil material, debris, and construction material shall be disposed of outside of nontidal wetlands, nontidal wetlands buffers, and the 100-year floodplain, and in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands.
12. **Temporary Staging Areas:** Temporary construction trailers or structures, staging areas and stockpiles shall not be located within nontidal wetlands, nontidal wetlands buffers, or the 100-year floodplain unless specifically included on the Approved Plan.
13. **Temporary Stream Access Crossings:** Temporary stream access crossings shall not be constructed or utilized unless shown on the Approved Plan. If temporary stream access crossings are determined necessary prior to initiation of work or at any time during construction, Authorized Person, its employees, agents or contractors shall submit a written request to the Administration and secure the necessary permits or approvals for such crossings before installation of the crossings. Temporary stream access crossings shall be removed and the disturbance stabilized prior to completion of authorized activity or within one (1) year of installation.
14. **Discharge:** Runoff or accumulated water containing sediment or other suspended materials shall not be discharged into waters of the State unless treated by an approved sediment control device or structure.
15. **Instream Construction Prohibition:**
☒ No instream construction is to occur under this Authorization;
☐ To protect important aquatic species, motor driven construction equipment shall not be allowed within stream channels unless on authorized ford crossings. Activities within stream channels are prohibited as determined by the classification of the stream (COMAR 26.08.02.08): Rock Creek is a Use I waterway; in-stream work may not be conducted from March 1 through June 15 inclusive, of any year.
16. **Instream Blasting:** Authorized Person shall obtain prior written approval from the Administration before blasting or using explosives in the stream channel.
17. **Minimum Disturbance:** Any disturbance of stream banks, channel bottom, wetlands, and wetlands buffer authorized by this Authorization or Approved Plan shall be the minimum necessary to conduct permitted activities. All disturbed areas shall be stabilized vegetatively no later than seven (7) days after construction is completed or in accordance with the approved grading or sediment and erosion control plan.
18. **Restoration of Construction Site:** Authorized Person shall restore the construction site upon completion of authorized activities. Undercutting, meandering or degradation of the stream banks or channel bottom, any deposition of sediment or other materials, and any alteration of wetland vegetation, soils, or hydrology, resulting directly or indirectly from construction or authorized activities, shall be corrected by Authorized Person as directed by the Administration.

FEDERALLY MANDATED STATE AUTHORIZATIONS

In accordance with the requirements of Section 401 of the Federal Clean Water Act, Water Quality Certification is hereby issued for any discharges to Waters of the U.S. authorized herein, subject to the conditions of this Authorization. In addition, as applicable, this Authorization constitutes the State's concurrence with the Applicant's certification that the activities authorized herein are consistent with the Maryland Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. Activities in the following counties are not subject to the Maryland Coastal Zone Management requirement: Allegany, Carroll, Frederick, Garrett, Howard, Montgomery, and Washington.

U.S. ARMY CORPS OF ENGINEERS AUTHORIZATION

The U.S. Army Corps of Engineers does not regulate the 100-year nontidal flooodplain. So, no corps authorization is required.

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1) No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2) Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3) Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
4) Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5) Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6) Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7) All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Uniola sp.), and/or Rye (Secale cereale). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. Kentucky 31 fescue shall not be utilized in wetland or buffer areas. The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8) After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9) To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:

   Use I waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
   Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year.
   Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.

10) Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11) Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.