REVISED DRAINAGE REPORT
FOR
MADRID

MESA, ARIZONA

Prepared For:

SCHULER HOMES, INC.
7001 N. Scottsdale Rd. #2050
Scottsdale, AZ 85253

Prepared By:

JMI & ASSOCIATES, INC.
4151 NORTH MARSHALL WAY, SUITE 12
SCOTTSDALE, ARIZONA 85251
(480) 945-1400 FAX (480) 945-4229

Civil Engineering
Subdivisions Land Planning

JMI Job No. 00514
June 6, 2004

Registered Professional Engineer (Civil)
CERTIFICATE NO.
19246
MATTHEW C.
OLSEN
Date Signed 6/1/04
ARIZONA, U.S.A.

REVISED DRAINAGE REPORT
FOR DA-B and Wash 1 at MADRID

TABLE OF CONTENTS

SECTION		PAGE
1.0	INTRODUCTION	1
2.0	BACKGROUND	1
3.0	LOCATION	2
4.0	PROJECT DESCRIPTION	2
5.0	FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)	3
6.0	OFF-SITE DRAINAGE	3
7.0	ON-SITE DRAINAGE	4
8.0	CONCLUSIONS	8

APPENDIX

APPENDIX A	Figure 1 – Vicinity Map
APPENDIX B	Figure 2 – Soils Map
APPENDIX C	Figure 3 – FEMA FIRM
APPENDIX D	Figures 4, 4.1-4.4 – Existing Onsite/Offsite Drainage Maps
APPENDIX E	Rational Method Calculations
APPENDIX F	Pre-Development HEC-1
APPENDIX G	Figure 5 – Aerial HEC-RAS
APPENDIX H	Figure 6 – Topo HEC-RAS
APPENDIX I	Pre-Development HEC-RAS
APPENDIX J	Post-Development HEC-1
APPENDIX K	Figure 7 – On-Site Aerial, Proposed HEC-RAS
APPENDIX L	Figure 8 – On-Site Topography, Proposed HEC-RAS
APPENDIX M	Post-Development HEC-RAS
APPENDIX N	Culvert/Storm Drain Analysis
APPENDIX O	Retention Calculations

Revised Drainage Report
For DA-B and Wash 1 at
Madrid
Mesa, Arizona

1. INTRODUCTION

This report has been prepared to meet the requirements of the City of Mesa and Maricopa County. The Madrid development is a Planned Area Development. The purpose of this report is to revise the hydrologic and hydraulic analyses that have been performed for the Madrid subdivision. This study will supercede portions of the current in force studies at the site, namely, the "Amended Drainage Report" for Madrid Subdivision by D & M Engineering, the "Final Drainage Report for Wash 2 in Madrid" by JMI & Associates and the "Revised Drainage Study for DA-B and Wash 1-Detention Basin Only" by JMI & Associates.

2. BACKGROUND

D & M engineering performed most of the hydrologic an hydraulic design for Madrid. JMI was hired to complete the construction drawings for the box culvert based on the hydrologic and hydraulic information provided by the accepted D & M report. Additionally, JMI performed an analysis of a small wash crossing the south corner of Madrid and set the pads and finished floor elevations based on the D & M drainage report.

This report was initiated due to complaints that the drainage patterns set out in the D & M report were causing flow to be redirected along McDowell Road in a manner that is not consistent with historic drainage patterns. Upon performing an independent review of the hydrologic information, JMI, in conjunction with the Flood Control District of Maricopa County and the City of Mesa determined that the existing condition flow patterns are not consistent with historical drainage patterns.

In addition to this concern, it was discovered through a review of historic aerial and topographical data that the flow patterns within the Madrid site itself are not consistent with historic drainage patterns. Further, the re-evaluated drainage area proved to be larger than estimated in the D & M report.

Since the Madrid development has most of the infrastructure in place at the time of this design, the drainage report will address how to rectify the flow through the site taking into account these developments. This drainage report presents the proposed solution.

3. LOCATION

The Madrid development is located in Mesa, adjacent to and on the south of McDowell Road between Waterbury Road and 90th Street and extends to the south. It is found in a portion of the north half of Section 4, Township 1 North, Range 7 East, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, refer to Appendix A: Figure 1 – Vicinity Map. The area of interest leads from the Northeast corner of the site and continues southeast across McDowell road.

Raven Roost, a local knoll, is found to the north of McDowell Road and to the northeast of the Madrid project. Stone Mountain is located immediately to the north of McDowell Road and the project with Thunder Mountain being found further to the north within the Usery Mountain Recreation Area.

4. PROJECT DESCRIPTION

The area of concern at Madrid surrounds a natural wash that leads from the Box Culvert at McDowell Road in a southwesterly direction. The wash contains a sandy bottom and runs at about 2-3% through the development. Historic aerial photos show that the main branch of this wash originally exited the site adjacent to an area near Lot 41. The development has now moved the main discharge adjacent to Lot 85. The area discussed in this report currently consists of the full road network and all lots are graded with some model homes fully constructed.

The flows that run in the wash originate to the north in the Usery Mountains, refer to Appendix E: Figure 4 – Off-site Drainage Map. The Parcel is located in an alluvial fan out wash from the upstream mountainous area.

The site falls within the boundaries for the Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona, prepared by US Department of Agriculture, Soil Conservation Service, Map Number 50, issued April 1986, refer to Appendix B: Figure 2 – Soils Map. The Parcel is comprised of soil units 63, 98, 110, 113, and 115. Unit 63 is a Gran-Wickenburg-rock outcrop complex on 10 –65 percent slopes. The unit is comprised of about 30-percent Gran very gravelly sandy loam, 25-percent Wickenburg gravelly sandy loam, and 25-percent rock outcrop (Hydrologic Soil Group D).

Unit 98 is a Pinamt-Tremant complex found on 1-10 percent slopes. The Unit is comprised of about 45-percent Pinamt extremely gravelly sandy loam and 35-percent Tremant gravelly loam (Hydrologic Soil Group B).

Unit 110 is a Suncity-Cipriano complex found on 1 to 7 percent slopes. The Unit is comprised of 55-percent Suncity gravelly loam and 30-percent Cipriano very gravelly loam (Hydrologic Soil Group D).

Unit 113 is Tremant a gravelly loam and is found on fan terraces. About 45-percent of the soil is Tremant gravelly loam that is calcareous throughout, and 35-percent is Tremant gravelly loam that is noncalcareous in the upper 9-inches and is calcareous below (Hydrologic Soil Group B).

Unit 115 is Tremant-Antho complex found on 1 to 5 percent soils. The Unit is about 45-percent Tremant gravelly sandy loam on fan terraces and stream terraces and 35-percent Antho sandy loam on narrow flood plains (Hydrologic Soil Group B).

5. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

The site falls on FEMA Flood Insurance Rate Map (FIRM) Panel Number 04013C2210E of 4350 of Maricopa County, Arizona, revised: July 19, 2001. The site is located in an area classified as Zone B. This zone is described as areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less then one foot or where the contributing drainage area is less then one square mile; or areas protected by levees from the base flood, refer to Appendix C: Figure 3 - FEMA FIRM.

6. OFF-SITE DRAINAGE

Refer to Appendix D: Off-Site Drainage Maps and Appendix E: Pre-development HEC-1 for details. The HEC-1 model was performed in a method consistent with the previously accepted study by D & M using the drainage areas and time of concentrations calculated by JMI.

Offsite Drainage Area A

Offsite drainage area "A" (DA-A) was defined with 18-acres and contributes to concentrated flows impacting East McDowell Road where a 30" culvert exists. This drainage area was analyzed using the Rational Method, resulting in a 100-year peak discharge of 42 cfs.

Offsite Drainage Area B

Offsite drainage area "B" originates in the Usery Mountain area (see Fig. 4). Runoff generated by this area is conveyed to the south where it becomes concentrated between Raven Roost and Stone Mountain, impacting the north side of McDowell Road at CP-B. This drainage area was defined with an area of 540 acres and was evaluated using HEC-1 to define a discharge at East McDowell Road.

McDowell Road, Drainage Area 1

McDowell Road, adjacent to the north of the Madrid development, is a typical crowned roadway with vertical curb on both sides. This road was widened with the development of Madrid, therefore, a pavement transition occurs near the northeast corner of the site with a vertical curb terminus. Existing pavement drainage conveyed along the gutter exits the road where this curb ends, causing the scour of material at this location.

The contributing drainage area for pavement drainage at this location was defined as 0.87 acres with a corresponding 100-year peak discharge of 7 cfs (see Rational Method). A 4-ft by 5-ft rock rip-rap blanket will be provided where the existing vertical curb ends (see Channels). A "V" swale will be graded to provide positive drainage to the south.

7. ON-SITE DRAINAGE

Predevelopment

As previously discussed, this site is located in an alluvial fan. This landform typically consist of wide shallow channels. This landform generally is subject to the frequent erosion and sedimentation from the transition from the adjacent hillside landforms. The result is a channel that can be unstable and change flow directions with time.

The concept provided here is based on the pre-development survey performed under the direction of D&M Engineering. The on-site alluvial fan was assumed to be relatively stable when this survey was performed, Even assuming this stability, the shallow channels can spread flow in directions that are difficult to predict. The concept presented in this report is substantiated by historical aerial photography. This pre-development analysis is to establish a reasonable flow distribution at the boundary of the site.

For the purposes of this study, the drainage areas downstream of CP-B will not be considered. Drainage areas below CP-B are part of an alluvial fan that are below this point can be subjective and will not improve the validity of this study. Using the CP-B concentration point will yield lower, more stringent pre-development flows to conform to.

In order to determine how the flows originating at CP-B were distributed through the site, a HEC-RAS model was prepared based on the pre-construction topographic survey. The model used the full flow impacting the site and determined the split at natural junctions. These junction locations were iterated to determine where a clear split would occur. The flows from these junctions were calculated by HEC-RAS using its flow optimization function. The results are presented in appendices F through H.

Existing Design

The D & M report anticipated the study area needed to accommodate 516 cfs. As calculated in the pre-development HEC-1 model, there was 935 cfs arriving at CP-B with some minor onsite flows. Currently McDowell Road and the Wall surrounding Madrid will divert a significant amount of this flow east and west along McDowell. McDowell has a local high point at the culvert crossing so flow will likely affect both directions. These diversions along McDowell Road are not in accordance with the historic flow patterns established in the HEC-RAS pre-development model.

Proposed Design

To mitigate this discrepancy, a regional detention basin immediately downstream of CP-B is proposed north of McDowell on a portion of the site that is undeveloped. The basin will collect the full flow arriving at CP-B and discharge through the existing box culverts. The predevelopment flow was routed through the proposed structure and the flows arriving south of McDowell were reduced to 590 cfs. The detailed HEC-1 model is presented in Appendix I.

This 590 cfs was modeled through the site using a HEC-RAS model based on the current site conditions with some proposed improvements. The purpose of these modifications is to ensure the flow discharges in a manner consistent with modeled pre-development condition presented above.

The improvements consist of the installation of culverts under 88th Street and some incised channel improvements. The culverts will discharge into existing retention basin G. A channel will be incised into the opposite end of the retention basin as shown on the improvement plans. The channel will be constructed between lots 38 through 59 and extend to the historic discharge point South of Lot 41.

Other minor improvements were included to ensure the proper distribution of flow through safe, controlled flowpaths. The finish floors of affected properties were raised when the proposed conditions placed them within 1 foot of the adjacent water surface.

As in the predevelopment model, this wash has several splits. The HEC-RAS split flow optimization option was used to determine the flow splits between reaches and across the culvert. The full results of this analysis are presented in Appendices J through L. The results are summarized in the following table.

Table 1: Flow Comparison

Existing Conditions		Proposed Grading by JMI	
Location	Flow (cfs)	Location	Flow (cfs)
CP-B (Flow crossing McDowell Road)	935	CP-B (After Detention)	590
River 1, Reach 1, Station 82.150	300	River 3, Reach 1, Station 471.466	127
River 3, Reach 2, Station 100.706	55	River 2, Reach 1, Station 46.798	52
River 4, Reach 2, Station 181.389	332	River1, Reach 3, Station 63.423	206
River 5, Reach 1, Station 222.208	246	River 4, Reach 1, Station 58.395	206

Existing Retention Requirements and Modifications

As part of the proposed grading modifications, existing retention basin "G" will lose some of its existing capacity. As summarized in Table 2, the retention volume in basin "G" will be reduced from 0.92 ac-ft to 0.14 ac-ft due to construction of the new diversion channel. Per the D&M report, a required retention volume of 1.15 ac-ft for Sub-Area 3 was distributed among basins B, C & G. The total provided retention volume provided by basins B, C & G will be reduced to 0.86 ac-feet. An additional 0.68 ac-ft of retention volume will be provided with the construction of the new detention basin north of McDowell Road to compensate for this loss. This new basin will provide 4-inches of depth below the invert of the box culvert for sedimentation and retention considerations. Refer to Table 2 below for a summary of this revised retention balance.

Table 2: Retention Balance (Basins B, C, G and Detention/Retention Basin)

Basin I.D.	Volume Required per D&M Report (ac-ft)	Existing Volume Provided (ac-ft)	Volume Provided after JMI Grading (ac-ft)
B	1.15	0.28	0.28
C		0.44	0.44
G		0.92	0.14
Deten/Reten Basin	N/A	N/A	0.68
Totals:	1.15	1.64	1.54

Retention basin "E" currently accepts onsite-generated runoff from sub-basin 2. With construction of the new channel north of lots 38-41, runoff from sub-basin 2 will be intercepted by this channel and diverted away from basin "E". Per the HEC-RAS post-grading model, basin "E" serves as an overbank retention basin for the main wash during the 100-year storm. However, for lesser storms, a new 12-inch culvert has been provided, adjacent to the northwest corner of lot 84, to convey low-flows from the new channel into existing retention basin "E" for storm events less than the 100-year storm.

Discharges without Retention

With the new channel design proposed by JMI, some onsite-generated runoff will be conveyed to an offsite location with no retention. These onsite drainage areas are identified per the D&M drainage report dated 10/15/99 as being sub-basins 2 and a portion of 3. This channel will also convey a portion of the discharge within the main wash, being 127 cfs. Per the HEC-RAS existing model, the historic 100-year peak discharge exiting the site at this location was estimated at 300 cfs. It is concluded that the historic discharge will not be exceeded with the proposed diversion of flows. A summary of these results are provided in Table 3 below:

Table 3: Summary of 100-yr Peak Discharges Exiting Site by New Channel

Sub-basin I.D. per D&M Report	Area (acres)	Rational Coefficient "C"	Q100 (cfs)
SUB 2	8.08	0.55	40
½ of SUB 3	4.48	0.55	22
Total On-Site Contribution (Time of Conc. = 5-10 min)			62
Offsite Post-Development Contribution (Time of Conc. = 4.6hrs)			127
Pre-Madrid Development or Historical Discharge			300

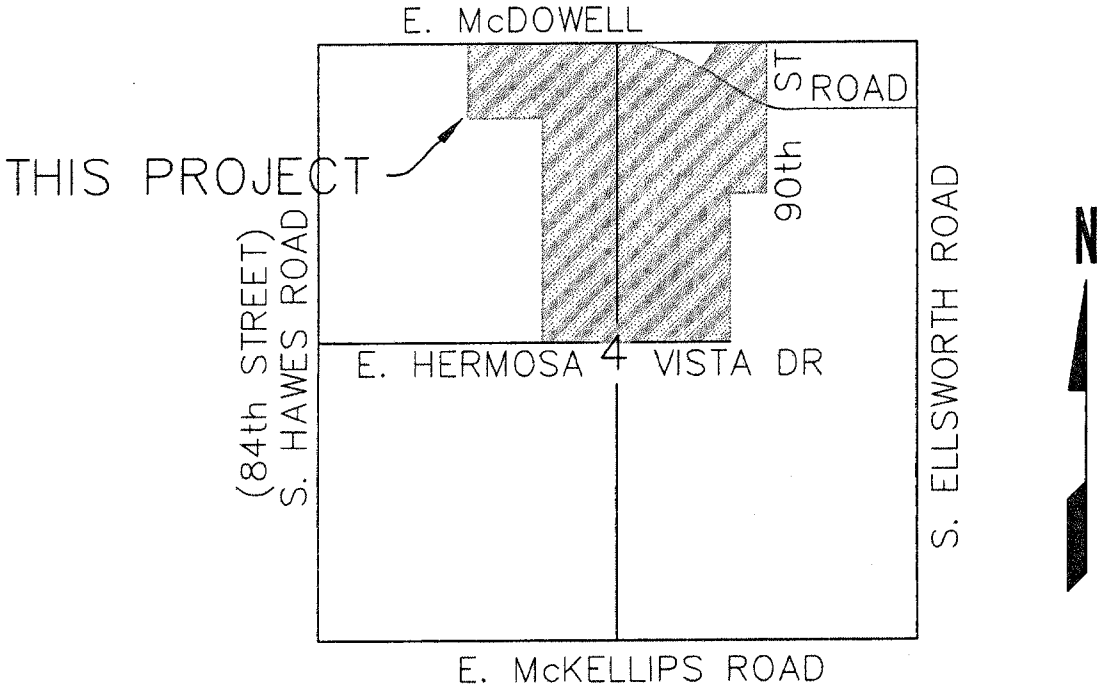
8. CONCLUSIONS

This drainage report demonstrates that the proposed concept for the redesign of Wash 1 will safely convey the 100-year storm to the downstream natural washes, and safely release it in a manner consistent with historic drainage patterns.

Outflow from the site will be released at a safe rate and finished floors adjacent to this wash will be set at least one foot above the calculated 100-year high water surface elevation.

APPENDIX A

Figure 1 – Vicinity Map



VICINITY MAP

N.T.S.

DSN: DSG	CKD: MO	DATE: 06/06/04	HORIZ: 1"=1'	VERT: NA

JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

XREF: none

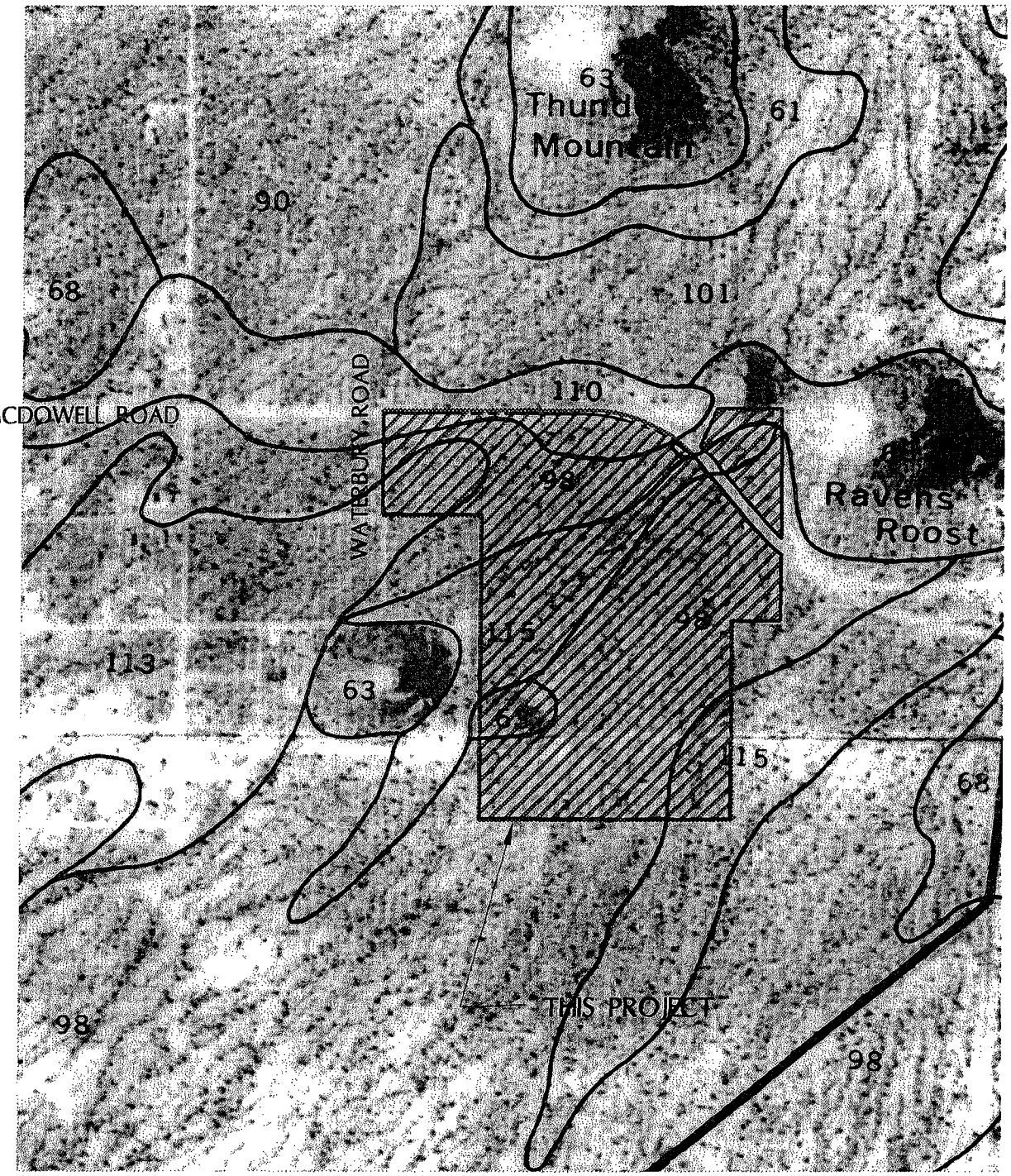
FIGURE 1:
VICINITY MAP
MADRID

JOB# 00514.00

1 OF 1

APPENDIX B

Figure 2 – Soils Map



DSN: DSG	CKD:	DATE: 09/24/02	HORIZ:NTS	VERT: N/A

JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

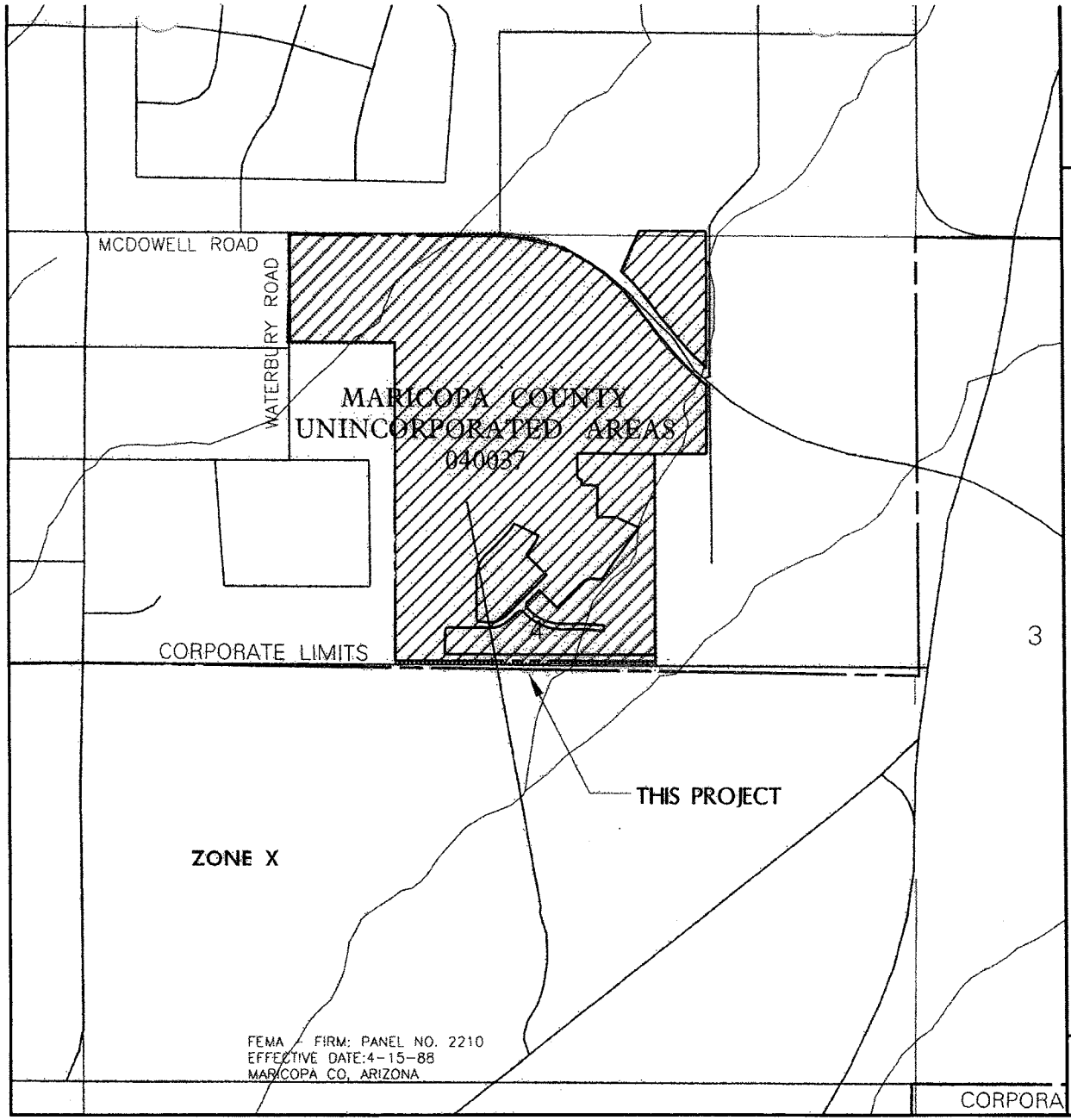
FIGURE 2 - SOILS MAP
MADRID
MESA, AZ

JOB# 000514.00

1 OF 1

P:\MMWEST\madrid\HYD\ROVFP_FIG2-MAD.DWG, 9/25/2002 4:12:27 AM, trels, 1:1000

APPENDIX C
Figure 3 – FEMA FIRM



APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2210 OF 4350

NUMBER PANEL SUFFIX

040037 2210 E

MAP NUMBER
04013C2210 E

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

DSN: DSG
CKD:
DATE: 09/24/02
HORIZ: 1"=1000'
VERT:

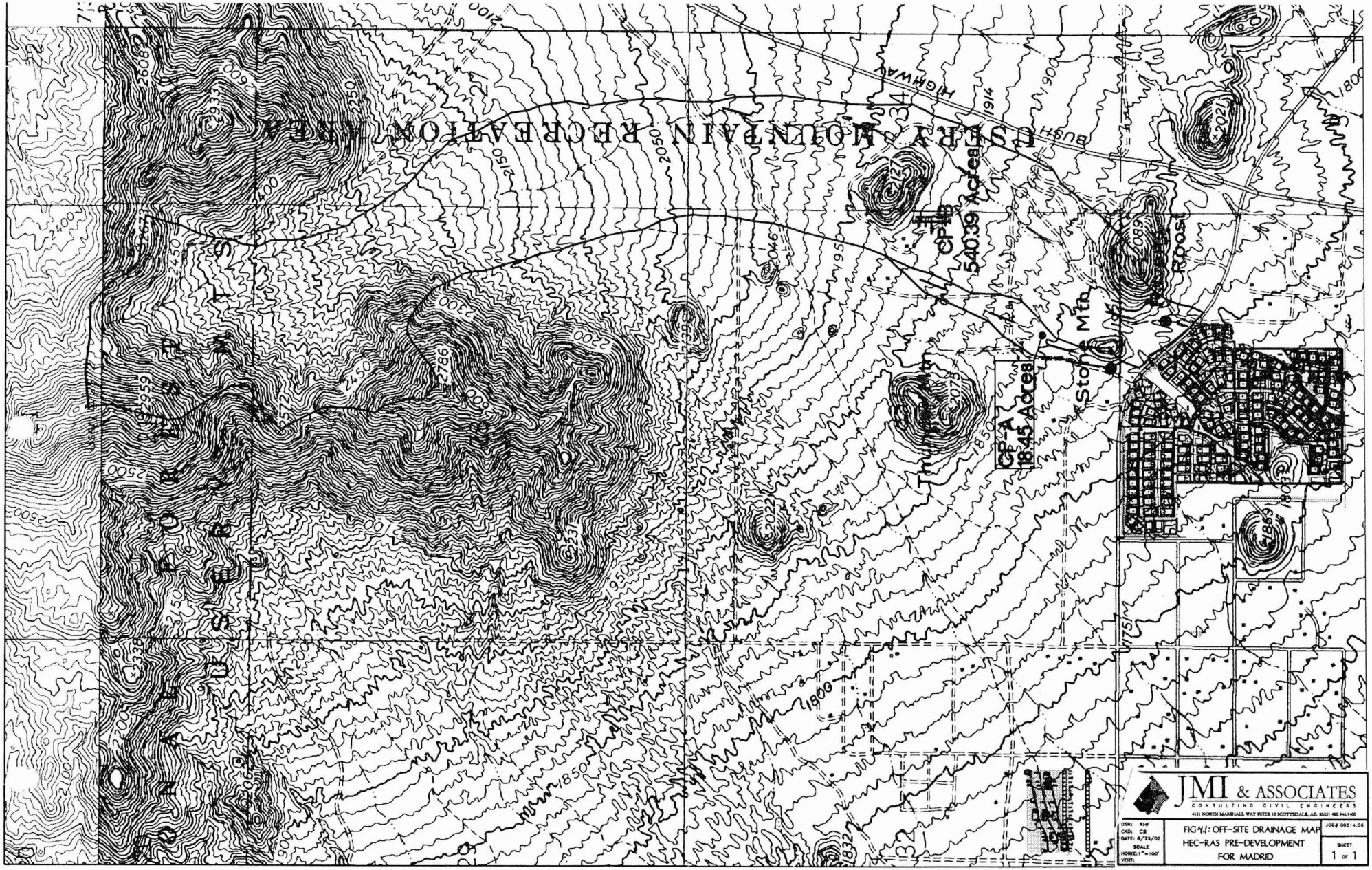
FEMA FIRM - FIGURE 3
MADRID, MARICOPA COUNTY, AZ

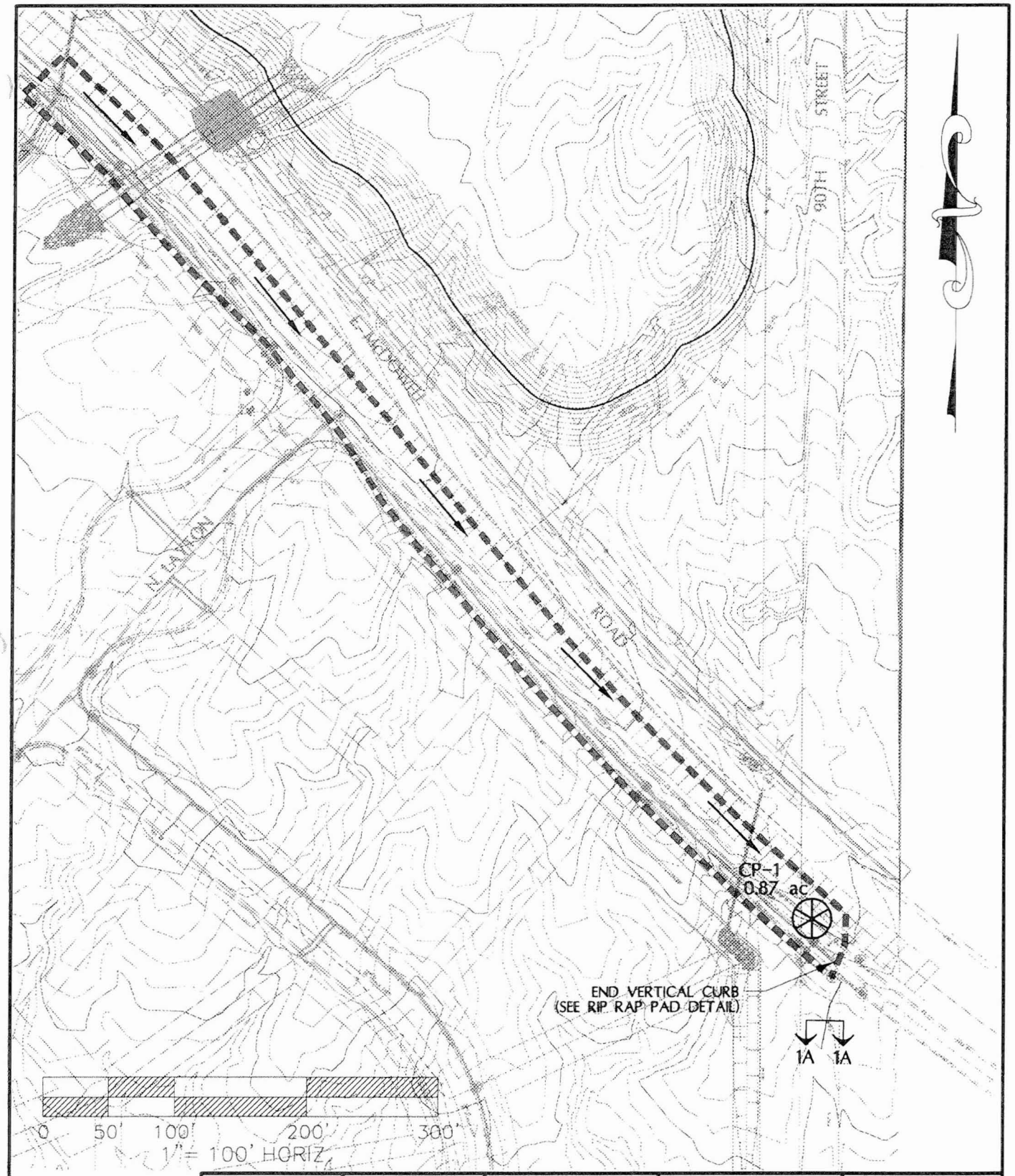
JOB# 00514.06

1 OF 1

APPENDIX D

Figures 4, 4.1-4.4 – Existing Onsite/Offsite Drainage Maps


USERY MOUNTAIN RECREATION AREA
BUSH HIGHWAY
CP-B
540.39 Acres
CP-A
18.45 Acres
Stone Mtn
Roost
Thunder Mtn
Superstition Mtns
Goldfield Mtns
JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4631 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480 945-1400
DSN: RHF
CKD: CB
DATE: 8/23/02
SCALE
HORIZ: 1" = 100'
VERT:
FIG 4.1: OFF-SITE DRAINAGE MAP
HEC-RAS PRE-DEVELOPMENT
FOR MADRID
JOB # 00514.06
SHEET
1 of 1



DSN: LAR	CKD: MCO	DATE: 3/11/04	HORIZ:1"=100'	VERT: N/A

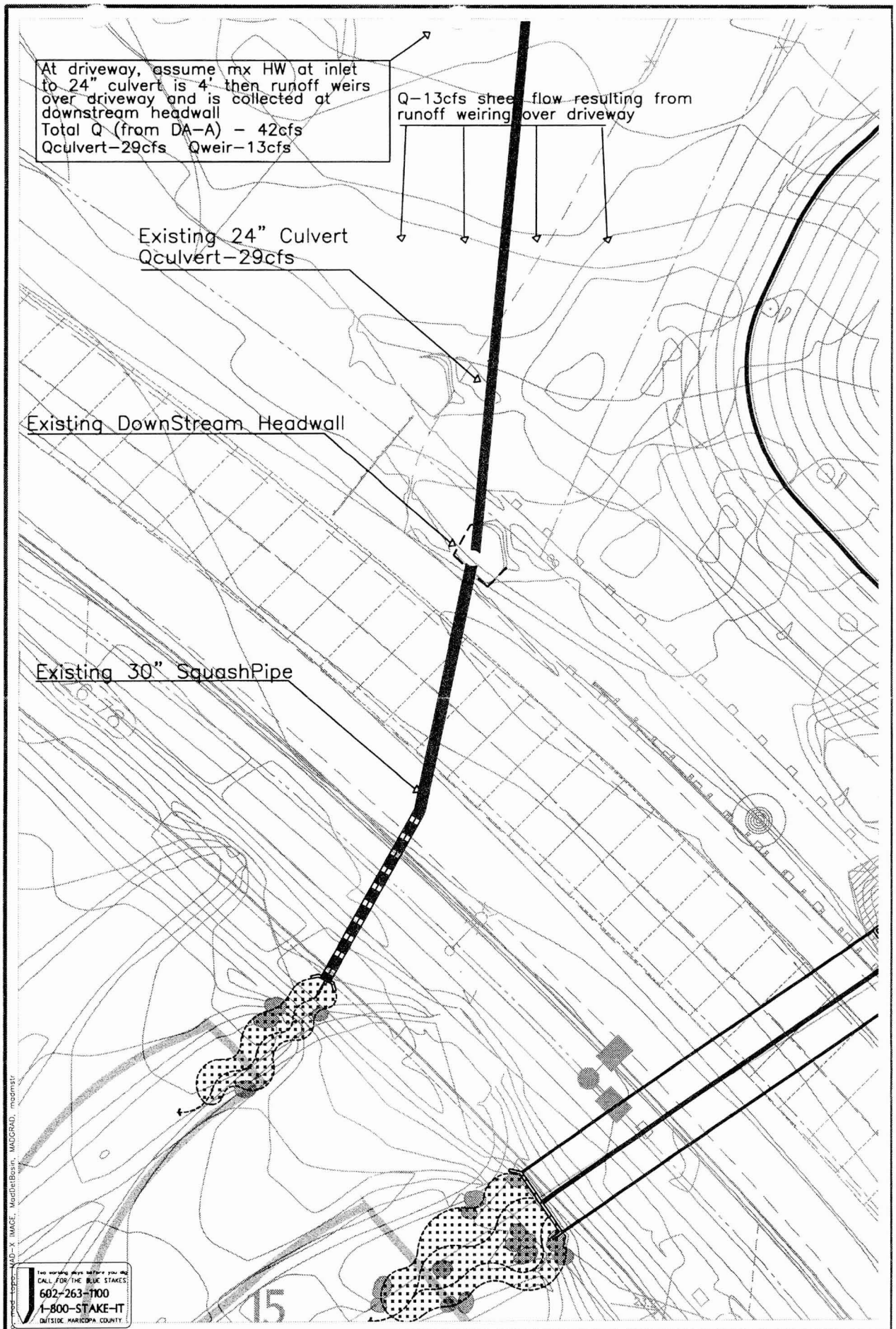
JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

FIG.4.2: OFFSITE DRAINAGE IMPROVEMENTS FOR MCDOWELL ROAD

JOB# 00514.00

1 OF 1

P:\MMWEST\madrid\HYDRO\MAD-McDowellHydro.dwg, 3/11/2004 2:48:41 PM, lromero, 1:100, Copyright © 2004, JMI & Associates, inc.



XREF: mad-FC1.dwg, mad-topo, NAD-X IMAGE, MadDetBasin, MADGRAD, madmstr

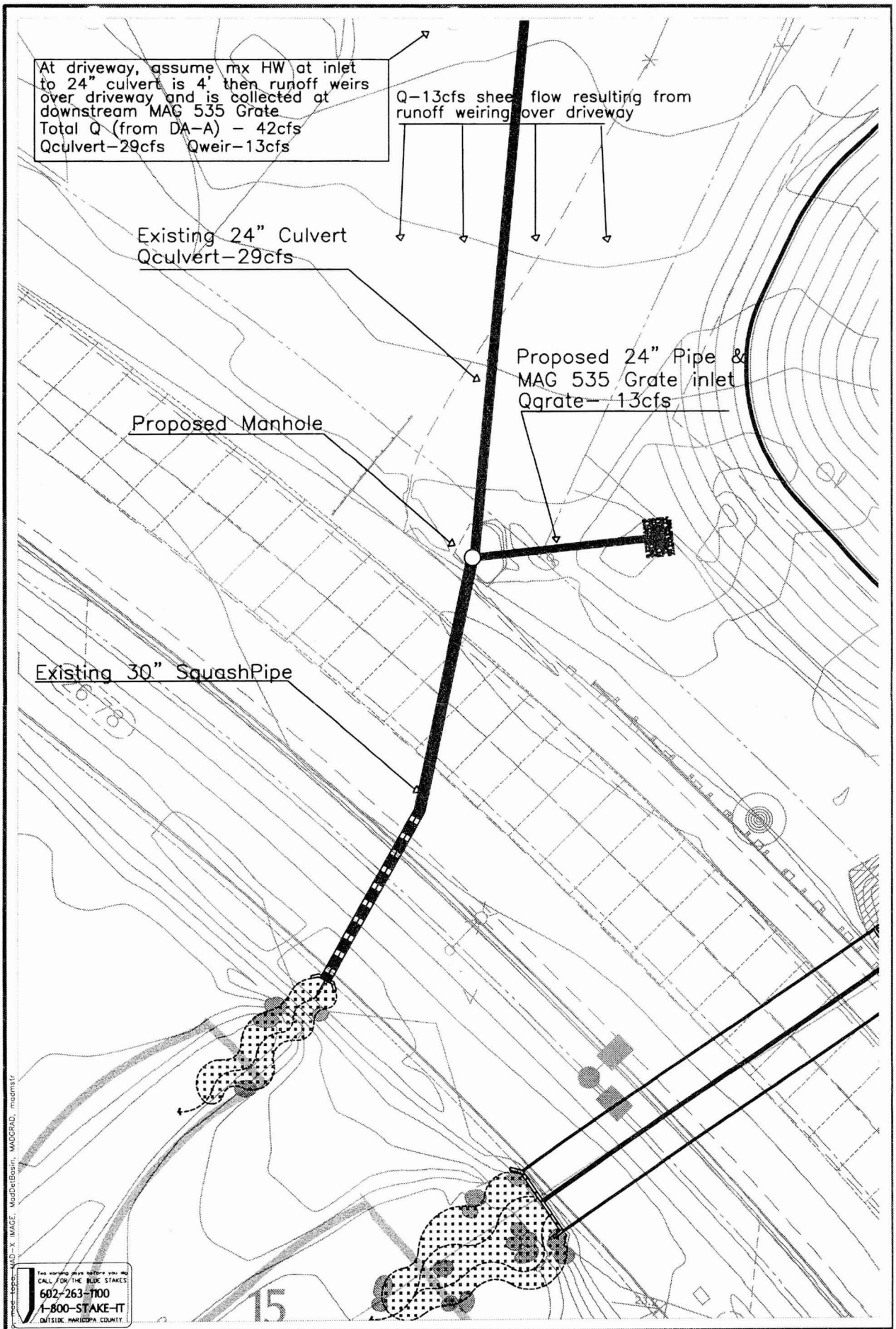
JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

DSN: TJD
CKD: MCO
DATE: 12/10/03
HORIZ: 1"=20'
VERT:

FIG. 4.3: EXISTING OFFSITE STORM DRAIN EXHIBIT MADRID

JOB# 00514.00

1 OF 1



JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

DSN: TJD
CKD: MCO
DATE: 12/10/03
HORIZ: 1"=20'
VERT:

FIG. 4.4: PROPOSED OFFSITE STORM DRAIN EXHIBIT MADRID

JOB# 00514.00

1 OF 1

APPENDIX E
Rational Method Calculations

HYDROLOGIC DESIGN DATA RECORD
RATIONAL METHOD

LOCATION DATA

PROJECT: Madrid CONCENTRATION POINT: CP-1 (McDowell Road)

LOCATION: STATION:

PROJECT NO.:

NAME OF STREAM/WATERSHED:

DESIGN DATA

DESIGN FREQUENCY:		2	5	10	25	50	100	YEARS
DRAINAGE AREA:	A1							ACRES
	A2							ACRES
	A3							ACRES
	TOTAL (A)						0.87	ACRES
DRAINAGE LENGTH:							890	FEET
ELEVATION:								
TOP OF DRAINAGE AREA:							1827.0	FEET
AT STRUCTURE:							1818.0	FEET
DRAINAGE AREA SLOPE:							1.01	PERCENT

DESIGN COMPUTATIONS

TIME OF CONCENTRATION:	T_c	10.09	8.77	8.25	7.55	7.12	6.81	MINUTES
RAINFALL INTENSITY (I):	I	2.89	4.21	4.94	6.16	7.24	8.09	INCHES/HOUR
RUNOFF COEFFICIENT (C):	C1	0.76	0.76	0.76	0.84	0.91	0.95	
	C2							
	C3							
WEIGHTED RUNOFF COEFFICIENT (C_W):	C_W	0.76	0.76	0.76	0.84	0.91	0.95	
PEAK DISCHARGE $Q_P = C_W I A$:	Q	2	3	3	4	6	7	CFS

COMPUTED BY: LAR DATE: 3/11/2004, 8:08:44 AM

CHECKED BY: DATE:

*SEE FIG 4.1: OFFSITE DRAINAGE MAP

HYDROLOGIC DESIGN DATA RECORD
RATIONAL METHOD

LOCATION DATA

PROJECT: Madrid
CONCENTRATION POINT: A
LOCATION:
STATION:
PROJECT NO.:
NAME OF STREAM/WATERSHED: OFFSITE WATERSHED DA-A, SAME FOR PRE & POST DEVELOPMENT

DESIGN DATA

DESIGN FREQUENCY:		2	5	10	25	50	100	YEARS
DRAINAGE AREA:	A1							ACRES
	A2							ACRES
	A3							ACRES
	TOTAL (A)						18.45	ACRES
DRAINAGE LENGTH:							3130	FEET
ELEVATION:								
TOP OF DRAINAGE AREA:							1930.0	FEET
AT STRUCTURE:							1830.0	FEET
DRAINAGE AREA SLOPE:							3.19	PERCENT

DESIGN COMPUTATIONS

TIME OF CONCENTRATION:	T_c	36.63	31.30	29.19	26.66	24.62	23.47	MINUTES
RAINFALL INTENSITY (I):	I	1.40	2.12	2.55	3.23	3.99	4.53	INCHES/HOUR
RUNOFF COEFFICIENT (C):	C1	0.40	0.40	0.40	0.44	0.48	0.50	
	C2							
	C3							
WEIGHTED RUNOFF COEFFICIENT (C_W):	C_W	0.40	0.40	0.40	0.44	0.48	0.50	
PEAK DISCHARGE $Q_P = C_W I A$:	Q	10	16	19	26	35	42	CFS

COMPUTED BY: TJD
DATE: 12/10/2003, 12:28:42 PM
CHECKED BY:
DATE:

APPENDIX F
Pre-Development HEC-1

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*             JUN   1998            *
*           VERSION 4.1             *
*                                   *
*  RUN DATE   20SEP02  TIME  08:54:59 *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 756-1104           *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID   JMI & ASSOCIATES
  2           ID   4151 N. MARSHALL WAY, SUITE 12
  3           ID   SCOTTSDALE, AZ 85251
  4           ID   480-945-1400
  5           ID
  6           ID   MADRID
  7           ID   MESA, ARIZONA
  8           ID   MODEL PREPARED BY DSG
  9           ID   FILE: G:\MMWEST\MADRID\HYDRO\FLOW CORRECTION\MAD_FC_PRE.DAT
 10           ID
 11           ID   THIS MODEL WAS PREPARED USING THE DDMSW SOFTWARE FROM THE FLOOD CONTROL
 12           ID   DISTRICT OF MARICOPA COUNTY.
 13           ID
 14           ID   D AND M WAS THE ORIGINAL CONSULTING ENGINEER FOR MADRID.  BASED ON THAT MODEL
 15           ID   JMI&ASSOC COMPLETED A DRAINAGE REPORT FOR THIS PROJECT IN AUGUST 2000.
 16           ID   FLEET-FISHER ENGINEERING IS WORKING ON A CUSTOM HOME LOT TO THE EAST OF MADRI
 17           ID   AND HAS DISPUTED THE ANALYSIS PRESENTED IN THE AUGUST 2000 DRAINAGE REPORT.
 18           ID
 19           ID   UPON REVIEW OF THE USGS TOPOGRAPHICAL MAP AN AERIALS, DRAINAGE AREA B FROM TH
 20           ID   AUGUST 2000 REPORT WAS REVISED. THIS MODEL ADDRESSES ONLY SUB-BASIN DA-B AND
 21           ID   CALCULATED THE DRAINAGE AREA AND SOILS AREAS BASED UPON THE REVISED BASIN BOU
 22           ID
 23           ID   THE ORIGINAL STORM DESCRIBED IN THE D AND M REPORT AND THE AUGUST 2000 JMI RE
 24           ID   APPEAR TO BE VALID AND ARE USED IN THIS MODEL UNMODIFIED.
 25           ID
 26           ID   Project ID: MADRID - 100 Year
 27           ID
 28           IT       5                    300
 29           IO       1

 30           KK
 31           KM   SUB-BASIN DA-B
 32           KM   6-HOUR RAINFALL, PATTERN NO. 1.31 WAS USED TO FIND TC & R FOR THIS BASIN
 33           KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .989
 34           KM     L = 2.69  Kb = .044  Adj. Slope =  258.0
 35           BA    .044
 36           IN      15
 37           KM   RAINFALL DEPTH OF 3.00 WAS SPATIALLY REDUCED AS SHOWN BY THE PB RECORD
 38           PB   2.967
 39           KM   THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 1.31
 40           PC    .000    .008    .016    .025    .033    .041    .050    .058    .066    .075
 41           PC    .087    .099    .119    .146    .227    .400    .791    .880    .922    .946
 42           PC    .958    .969    .981    .990   1.000
 43           LG    .350    .360   5.000    .280   7.000
 44           UC    .471    .389
 45           UA      0       3       5       8      12      20      43      75      90      96
 46           UA     100
 47           ZZ
```

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*             JUN   1998            *
*           VERSION 4.1             *
*                                   *
*  RUN DATE   20SEP02  TIME  08:54:59 *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 756-1104           *
*                                   *
*************************************
```

```
                    JMI & ASSOCIATES
                    4151 N. MARSHALL WAY, SUITE 12
                    SCOTTSDALE, AZ 85251
                    480-945-1400

                    MADRID
                    MESA, ARIZONA
                    MODEL PREPARED BY DSG
                    FILE: G:\MMWEST\MADRID\HYDRO\FLOW CORRECTION\MAD_FC_PRE.DAT

                    THIS MODEL WAS PREPARED USING THE DEMSW SOFTWARE FROM THE FLOOD CONTROL
                    DISTRICT OF MARICOPA COUNTY.

                    D AND M WAS THE ORIGINAL CONSULTING ENGINEER FOR MADRID.  BASED ON THAT MODEL
                    JMI&ASSOC COMPLETED A DRAINAGE REPORT FOR THIS PROJECT IN AUGUST 2000.
                    FLEET-FISHER ENGINEERING IS WORKING ON A CUSTOM HOME LOT TO THE EAST OF MADRI
                    AND HAS DISPUTED THE ANALYSIS PRESENTED IN THE AUGUST 2000 DRAINAGE REPORT.

                    UPON REVIEW OF THE USGS TOPOGRAPHICAL MAP AN AERIALS, DRAINAGE AREA B FROM TH
                    AUGUST 2000 REPORT WAS REVISED. THIS MODEL ADDRESSES ONLY SUB-BASIN DA-B AND
                    CALCULATED THE DRAINAGE AREA AND SOILS AREAS BASED UPON THE REVISED BASIN BOU

                    THE ORIGINAL STORM DESCRIBED IN THE D AND M REPORT AND THE AUGUST 2000 JMI RE
                    APPEAR TO BE VALID AND ARE USED IN THIS MODEL UNMODIFIED.

                    Project ID: MADRID - 100 Year

 29 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2    0  ENDING DATE
                     NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            *************
            *           *
 30 KK      *           *
            *           *
            *************
                    SUB-BASIN DA-B
                    6-HOUR RAINFALL, PATTERN NO. 1.31 WAS USED TO FIND TC & B FOR THIS BASIN
                    THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .989
                      L = 2.69  Kb = .044  Adj. Slope =  258.0
                    RAINFALL DEPTH OF 3.00 WAS SPATIALLY REDUCED AS SHOWN BY THE PB RECORD
                    THE FOLLOWING PC RECORD USED A 6-HOUR STORM WITH A PATTERN No. OF 1.31

 36 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE      1    0  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 35 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .84  SUBBASIN AREA

                PRECIPITATION DATA

 39 PB                STORM        2.97  BASIN TOTAL PRECIPITATION

 39 PI            INCREMENTAL PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
```

.03	.03	.06	.06	.06	.13	.13	.13	.03	.03
.03	.01	.01	.01	.01	.01	.01	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00								

43 LG GREEN AND AMPT LOSS RATE

STRTL	.35	STARTING LOSS
DTH	.36	MOISTURE DEFICIT
PSIF	5.00	WETTING FRONT SUCTION
XKSAT	.29	HYDRAULIC CONDUCTIVITY
RTIMP	7.00	PERCENT IMPERVIOUS AREA

44 UC CLARK UNITGRAPH

TC	.47	TIME OF CONCENTRATION
R	.39	STORAGE COEFFICIENT

45 UA ACCUMULATED-AREA VS. TIME, 11 ORDINATES

.0	3.0	5.0	8.0	12.0	20.0	43.0	75.0	90.0	96.0
100.0									

***

UNIT HYDROGRAPH PARAMETERS

CLARK TC= .47 HR, R= .39 HR

SNYDER TP= .41 HR, CP= .69

UNIT HYDROGRAPH
29 END-OF-PERIOD ORDINATES

29.	87.	213.	589.	905.	881.	741.	598.	482.	389.
314.	253.	204.	165.	133.	107.	86.	70.	56.	45.
37.	29.	24.	19.	15.	12.	10.	8.	7.	

HYDROGRAPH AT STATION

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.01	.01	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.01	.01	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.01	.01	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.01	.01	.00	1.	1		1250	155	.00	.00	.00	0.
1		0025	6	.01	.01	.00	1.	1		1255	156	.00	.00	.00	0.
1		0030	7	.01	.01	.00	1.	1		1300	157	.00	.00	.00	0.
1		0035	8	.01	.01	.00	2.	1		1305	158	.00	.00	.00	0.
1		0040	9	.01	.01	.00	2.	1		1310	159	.00	.00	.00	0.
1		0045	10	.01	.01	.00	3.	1		1315	160	.00	.00	.00	0.
1		0050	11	.01	.01	.00	3.	1		1320	161	.00	.00	.00	0.
1		0055	12	.01	.01	.00	3.	1		1325	162	.00	.00	.00	0.
1		0100	13	.01	.01	.00	3.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	3.	1		1335	164	.00	.00	.00	0.
1		0110	15	.01	.01	.00	3.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	3.	1		1345	166	.00	.00	.00	0.
1		0120	17	.01	.01	.00	3.	1		1350	167	.00	.00	.00	0.
1		0125	18	.01	.01	.00	4.	1		1355	168	.00	.00	.00	0.
1		0130	19	.01	.01	.00	4.	1		1400	169	.00	.00	.00	0.
1		0135	20	.01	.01	.00	4.	1		1405	170	.00	.00	.00	0.
1		0140	21	.01	.01	.00	4.	1		1410	171	.00	.00	.00	0.
1		0145	22	.01	.01	.00	4.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.01	.00	4.	1		1420	173	.00	.00	.00	0.
1		0155	24	.01	.01	.00	4.	1		1425	174	.00	.00	.00	0.
1		0200	25	.01	.01	.00	4.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	4.	1		1435	176	.00	.00	.00	0.
1		0210	27	.01	.01	.00	4.	1		1440	177	.00	.00	.00	0.
1		0215	28	.01	.01	.00	4.	1		1445	178	.00	.00	.00	0.
1		0220	29	.01	.01	.00	4.	1		1450	179	.00	.00	.00	0.
1		0225	30	.01	.01	.00	4.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.01	.00	4.	1		1500	181	.00	.00	.00	0.
1		0235	32	.01	.01	.00	4.	1		1505	182	.00	.00	.00	0.
1		0240	33	.01	.01	.00	4.	1		1510	183	.00	.00	.00	0.
1		0245	34	.01	.01	.00	5.	1		1515	184	.00	.00	.00	0.
1		0250	35	.02	.02	.00	5.	1		1520	185	.00	.00	.00	0.
1		0255	36	.02	.02	.00	5.	1		1525	186	.00	.00	.00	0.
1		0300	37	.02	.02	.00	5.	1		1530	187	.00	.00	.00	0.
1		0305	38	.03	.02	.00	6.	1		1535	188	.00	.00	.00	0.
1		0310	39	.03	.02	.00	6.	1		1540	189	.00	.00	.00	0.
1		0315	40	.03	.02	.00	7.	1		1545	190	.00	.00	.00	0.
1		0320	41	.08	.07	.01	8.	1		1550	191	.00	.00	.00	0.
1		0325	42	.08	.07	.01	9.	1		1555	192	.00	.00	.00	0.
1		0330	43	.08	.07	.01	10.	1		1600	193	.00	.00	.00	0.
1		0335	44	.17	.12	.05	14.	1		1605	194	.00	.00	.00	0.
1		0340	45	.17	.10	.07	23.	1		1610	195	.00	.00	.00	0.
1		0345	46	.17	.09	.09	38.	1		1615	196	.00	.00	.00	0.
1		0350	47	.39	.08	.31	79.	1		1620	197	.00	.00	.00	0.
1		0355	48	.39	.07	.31	157.	1		1625	198	.00	.00	.00	0.
1		0400	49	.39	.07	.32	274.	1		1630	199	.00	.00	.00	0.
1		0405	50	.10	.06	.03	465.	1		1635	200	.00	.00	.00	0.
1		0410	51	.10	.06	.03	703.	1		1640	201	.00	.00	.00	0.
1		0415	52	.10	.06	.04	892.	1		1645	202	.00	.00	.00	0.
1		0420	53	.03	.03	.00	935.	1		1650	203	.00	.00	.00	0.
1		0425	54	.03	.03	.00	845.	1		1655	204	.00	.00	.00	0.
1		0430	55	.03	.03	.00	728.	1		1700	205	.00	.00	.00	0.

1	0435	56	.02	.02	.00	611.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.02	.02	.00	502.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.02	.02	.00	408.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.01	.01	.00	332.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.01	.01	.00	270.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.01	.01	.00	220.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.01	.00	179.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.01	.00	145.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.01	.00	118.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.01	.01	.00	96.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.01	.00	79.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.01	.01	.00	64.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.01	.01	.00	53.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.01	.01	.00	44.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.01	.00	36.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.01	.01	.00	30.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.01	.01	.00	25.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.01	.01	.00	21.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	17.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	14.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	11.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	7.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	4.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	3.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	2.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	2.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	1.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	1.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	1.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	1.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	1.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

```
*******************************************************************************************************************

   TOTAL RAINFALL =    2.97, TOTAL LOSS =    1.64, TOTAL EXCESS =    1.32

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.92-HR
+  (CFS)       (HR)
                          (CFS)
+   935.       4.33                119.         30.          29.          29.
                        (INCHES)   1.315        1.318        1.318        1.318
                        (AC-FT)     59.          59.          59.          59.

                       CUMULATIVE AREA =     .94 SQ MI

1
                                          RUNOFF SUMMARY
                                     FLOW IN CUBIC FEET PER SECOND
                                   TIME IN HOURS,  AREA IN SQUARE MILES

                                   PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
       OPERATION        STATION    FLOW    PEAK                                          AREA      STAGE     MAX STAGE
+                                                       6-HOUR      24-HOUR      72-HOUR
       HYDROGRAPH AT
+                                   935.    4.33         119.         30.          29.       .94

*** NORMAL END OF HEC-1 ***
```

APPENDIX G

Figure 5 – Aerial HEC-RAS

APPENDIX H

Figure 6 – Topo HEC-RAS

APPENIDX K

Figure 7 – On-Site Aerial, Proposed HEC-RAS

APPENDIX L

Figure 8 – On-Site Topography, Proposed HEC-RAS

APPENDIX M
Post-Development HEC-RAS

HEC-RAS Plan: Plan 16 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	2049.398	PF 1	590.00	1820.00	1821.81	1821.81	1822.45	0.012200	6.40	92.19	71.82	1.00
1	1993.112	PF 1	590.00	1819.00	1820.47	1820.76	1821.43	0.026717	7.88	74.91	77.55	1.41
1	1915.218	PF 1	590.00	1817.59	1819.42	1819.43	1819.85	0.014112	5.25	112.38	133.07	1.01
1	1870.342	PF 1	590.00	1816.00	1818.25	1818.46	1818.94	0.029254	6.64	88.81	127.46	1.40
1	1788.860	PF 1	590.00	1815.00	1816.55	1816.60	1817.08	0.016969	6.00	101.77	119.60	1.11
1	1737.598	PF 1	590.00	1813.98	1815.63	1815.74	1816.09	0.022617	5.39	109.51	177.47	1.21
1	1722.778	PF 1	590.00	1813.29	1815.11	1815.31	1815.70	0.025815	6.20	95.24	138.24	1.32
1	1694.520	PF 1	590.00	1813.00	1814.26	1814.43	1814.80	0.039294	5.90	99.95	213.87	1.52
1	1623.853	PF 1	590.00	1811.98	1813.21	1813.21	1813.54	0.014729	4.57	128.97	194.12	0.99
1	1601.345	PF 1	590.00	1811.00	1812.54	1812.60	1813.07	0.028647	5.83	101.17	174.23	1.35
1	1534.173	PF 1	590.00	1810.00	1811.04	1811.05	1811.47	0.019480	5.29	111.44	165.92	1.14
1	1476.548	PF 1	590.00	1808.09	1809.55	1809.70	1810.04	0.032184	5.63	104.86	208.01	1.40
2	1403.497	PF 1	537.80	1807.15	1807.95	1808.34	1809.89	0.180081	11.17	48.14	124.09	3.16
2	1381.105	PF 1	537.80	1806.50	1807.28	1807.43	1808.04	0.034762	7.00	76.85	116.44	1.52
2	1329.952	PF 1	537.80	1805.64	1806.48	1806.75	1807.35	0.049570	7.48	71.86	128.47	1.76
2	1296.727	PF 1	537.80	1804.21	1805.22	1805.41	1805.87	0.037228	6.50	82.77	147.43	1.53
2	1288.146	PF 1	537.80	1803.84	1804.45	1804.72	1806.19	0.029715	10.60	50.74	103.74	2.67
2	1287		Lat Struct									
2	1240.243	PF 1	537.80	1803.08	1803.81	1804.39	1806.13	0.034999	12.23	43.97	81.94	2.94
2	1217.202	PF 1	537.80	1801.00	1801.92	1802.70	1804.83	0.093714	13.69	39.29	45.52	2.60
2	1216		Lat Struct									
2	1156.333	PF 1	537.80	1799.00	1800.34	1801.49	1804.68	0.096872	16.72	32.16	28.03	2.75
2	1127.157	PF 1	537.80	1798.00	1799.66	1800.48	1802.29	0.045970	13.01	41.33	29.93	1.95
2	1121.867	PF 1	537.80	1796.00	1800.27	1798.04	1800.34	0.000406	2.02	266.78	91.91	0.21
2	1118.328	PF 1	537.80	1792.00	1800.29	1795.86	1800.33	0.000174	1.51	355.13	97.10	0.14
2	1101.519	PF 1	415.99	1796.00	1800.23	1798.29	1800.31	0.000716	2.21	187.93	85.99	0.26
2	1091.588	PF 1	414.63	1797.50	1800.15	1799.03	1800.27	0.001747	2.90	148.40	99.10	0.40
2	1053.249	PF 1	411.90	1797.00	1799.39	1799.39	1799.84	0.013748	5.39	76.41	84.82	1.00
2	986.395	PF 1	411.90	1796.20	1797.98	1798.08	1798.69	0.020931	6.77	60.83	64.92	1.23
2	956.934	PF 1	411.90	1795.70	1797.01	1797.26	1797.76	0.052393	6.96	59.15	122.49	1.77
2	926.956	PF 1	411.90	1795.00	1796.15	1796.27	1796.70	0.023025	5.96	69.06	97.27	1.25
2	844.723	PF 1	411.90	1791.22	1793.52	1793.79	1794.42	0.032918	7.61	54.12	68.95	1.51
2	796.317	PF 1	411.90	1788.49	1789.66	1790.22	1791.71	0.102049	11.49	35.85	57.80	2.57
2	727.000	PF 1	411.90	1787.57	1789.86	1789.86	1790.26	0.014208	5.04	81.69	103.27	1.00
2	664.485	PF 1	411.90	1785.00	1789.01	1789.23	1789.94	0.210906	7.78	52.97	263.51	3.06
2	627.831	PF 1	411.90	1787.00	1788.44	1788.44	1788.77	0.014908	4.59	89.75	135.54	0.99
2	545.792	PF 1	411.90	1784.53	1785.40	1785.70	1786.34	0.077747	7.74	53.21	126.69	2.10
2	407.760	PF 1	411.90	1781.11	1783.24	1783.24	1783.73	0.012789	5.65	72.89	71.61	0.99
3	297.219	PF 1	205.93	1779.00	1779.72	1780.01	1783.42	0.331077	15.42	13.36	33.53	4.30

HEC-RAS Plan: Plan 16 Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
3	223.538	PF 1	205.93	1774.30	1777.43	1777.41	1777.44	0.000039	0.56	366.10	149.22	0.06
3	159.912	PF 1	205.93	1774.00	1777.24	1777.24	1777.41	0.019419	3.28	62.78	190.81	1.01
3	63.423	PF 1	205.93	1773.73	1775.59	1775.46	1775.94	0.010007	4.73	43.55	46.43	0.86

HEC-RAS Plan: Plan 16 River: 2 Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	2015.976	PF 1	52.20	1807.70	1807.96	1808.18	1809.90	0.342327	11.17	4.68	19.51	4.02
1	1989.881	PF 1	52.20	1807.20	1807.89	1807.90	1808.21	0.017277	4.58	11.40	19.16	1.05
1	1924.050	PF 1	52.20	1805.00	1805.95	1806.11	1806.42	0.048147	5.50	9.49	26.15	1.61
1	1901.470	PF 1	52.20	1805.00	1805.24	1805.28	1805.39	0.035067	3.10	17.07	97.34	1.24
1	1895.003	PF 1	52.20	1804.93	1805.21	1805.22	1805.30	0.006230	2.37	22.00	131.55	1.02
1	1857.578	PF 1	52.20	1803.77	1804.36	1804.49	1804.82	0.031763	5.46	9.56	55.46	2.32
1	1841.608	PF 1	52.20	1803.00	1803.69	1803.84	1804.17	0.054878	5.59	9.34	27.86	1.70
1	1809.517	PF 1	52.20	1802.82	1803.27	1803.27	1803.40	0.019422	2.92	17.86	64.82	0.98
1	1755.845	PF 1	52.20	1801.34	1801.89	1801.94	1802.11	0.030749	3.73	14.00	49.76	1.24
1	1705.806	PF 1	52.20	1798.58	1799.51	1799.30	1799.59	0.004429	2.29	22.79	39.14	0.53
1	1697		Culvert									
1	1607.299	PF 1	52.20	1796.00	1796.85	1796.64	1796.98	0.005806	2.90	17.99	26.56	0.62
1	1578.228	PF 1	52.20	1795.81	1796.50	1796.50	1796.71	0.017043	3.64	14.33	33.83	0.99
1	1548.181	PF 1	52.20	1795.00	1795.57	1795.68	1795.98	0.033747	5.18	10.08	23.41	1.39
1	1466.715	PF 1	52.20	1793.00	1793.61	1793.63	1793.87	0.019826	4.08	12.78	28.46	1.07
1	1450.807	PF 1	52.20	1792.39	1793.03	1793.15	1793.43	0.037307	5.08	10.27	26.51	1.44
1	1415.489	PF 1	52.20	1791.00	1791.83	1791.95	1792.29	0.027844	5.41	9.65	18.10	1.30
1	1353.982	PF 1	52.20	1790.00	1790.62	1790.62	1790.82	0.018700	3.66	14.27	35.90	1.02
1	1316.490	PF 1	52.20	1789.00	1789.58	1789.67	1789.94	0.030045	4.81	10.85	25.80	1.31
1	1299.640	PF 1	52.20	1788.00	1788.37	1788.60	1789.10	0.086585	6.85	7.62	23.57	2.12
1	1289		Culvert									
1	1199.017	PF 1	52.20	1785.00	1786.22	1785.73	1786.31	0.002496	2.51	20.84	19.95	0.43
1	1182.818	PF 1	52.20	1785.00	1785.84	1785.84	1786.21	0.015239	4.84	10.78	14.98	1.01
1	1127.400	PF 1	52.20	1784.00	1785.03	1785.03	1785.31	0.016191	4.22	12.36	22.43	1.00
1	1070.657	PF 1	52.20	1783.00	1783.40	1783.53	1783.83	0.047348	5.28	9.89	28.83	1.59
1	1023.228	PF 1	52.20	1782.00	1782.27	1782.45	1782.90	0.104983	6.38	8.18	32.58	2.24
1	924.013	PF 1	52.20	1779.65	1780.01	1780.01	1780.01	0.000080	0.08	112.48	139.30	0.05
1	779.309	PF 1	52.20	1770.00	1774.29	1774.15	1774.29	0.000001	0.09	610.59	166.69	0.01
1	693.224	PF 1	52.20	1769.00	1774.20	1774.19	1774.28	0.020741	2.37	22.07	114.71	0.95
1	596.519	PF 1	52.20	1771.11	1772.21	1772.21	1772.47	0.016901	4.09	12.75	25.03	1.01
1	515.146	PF 1	52.20	1767.00	1768.02	1768.38	1769.34	0.138950	9.19	5.68	15.95	2.72
1	483.738	PF 1	52.20	1766.89	1767.61	1767.67	1767.97	0.023292	4.85	10.76	20.73	1.19
1	393.191	PF 1	52.20	1763.99	1764.48	1764.63	1764.96	0.050805	5.54	9.42	26.83	1.65
1	351.122	PF 1	52.20	1762.90	1763.46	1763.47	1763.68	0.018225	3.79	13.78	32.25	1.02
1	275.012	PF 1	52.20	1760.62	1761.09	1761.21	1761.49	0.050575	5.10	10.24	33.03	1.61
1	250.910	PF 1	52.20	1760.00	1760.50	1760.51	1760.74	0.019354	3.95	13.22	30.41	1.05
1	183.334	PF 1	52.20	1758.26	1758.74	1758.82	1759.06	0.032811	4.55	11.48	31.76	1.33
1	152.363	PF 1	52.20	1757.00	1757.61	1757.72	1757.95	0.039165	4.67	11.18	33.96	1.43

HEC-RAS Plan: Plan 16 River: 2 Reach: 1 Profile: PF 1 (Continued)

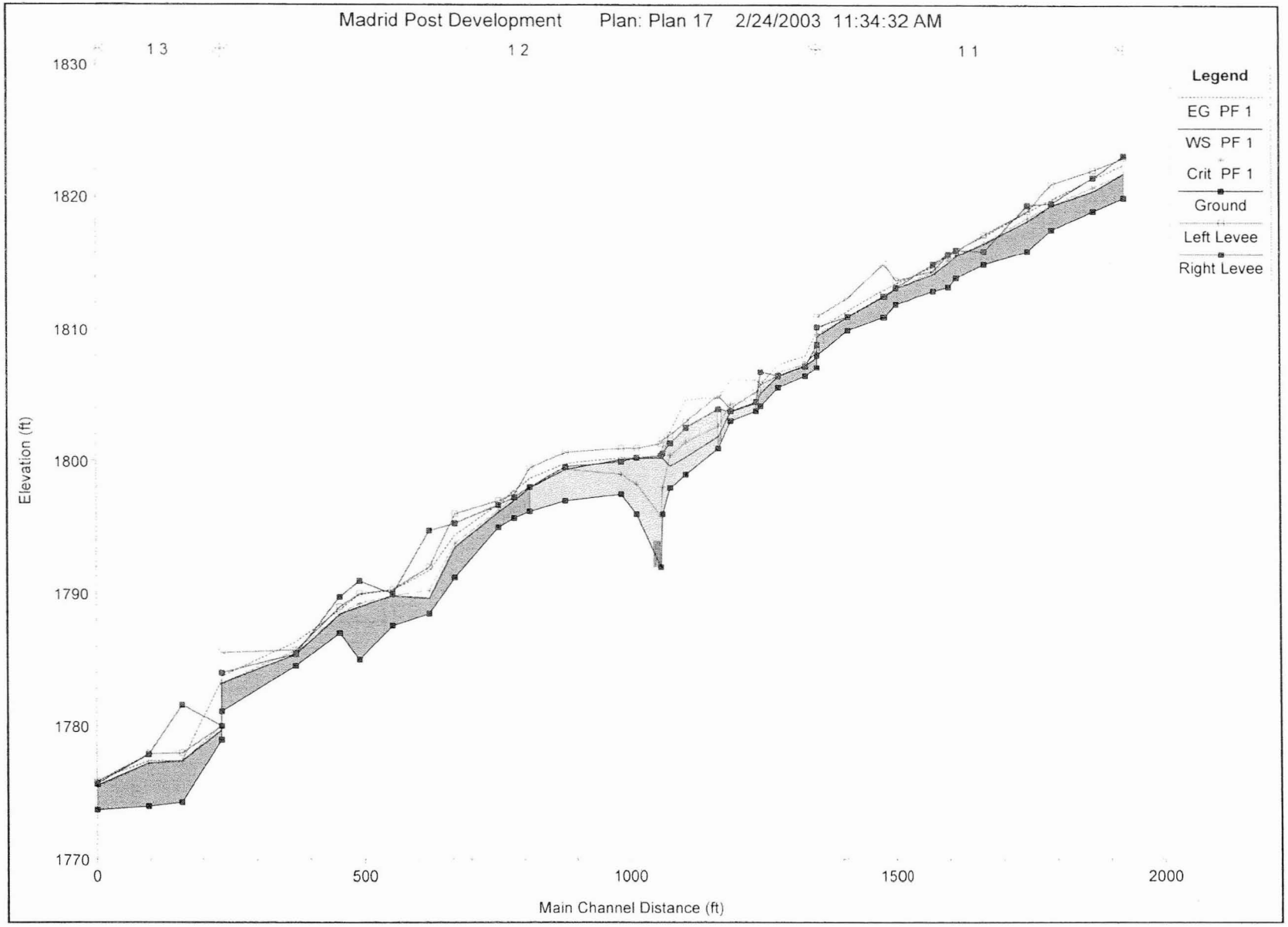
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	82.485	PF 1	52.20	1755.72	1756.26	1756.26	1756.41	0.020234	3.10	16.86	57.80	1.01
1	46.798	PF 1	52.20	1754.67	1755.11	1755.18	1755.34	0.047673	3.87	13.48	62.83	1.47

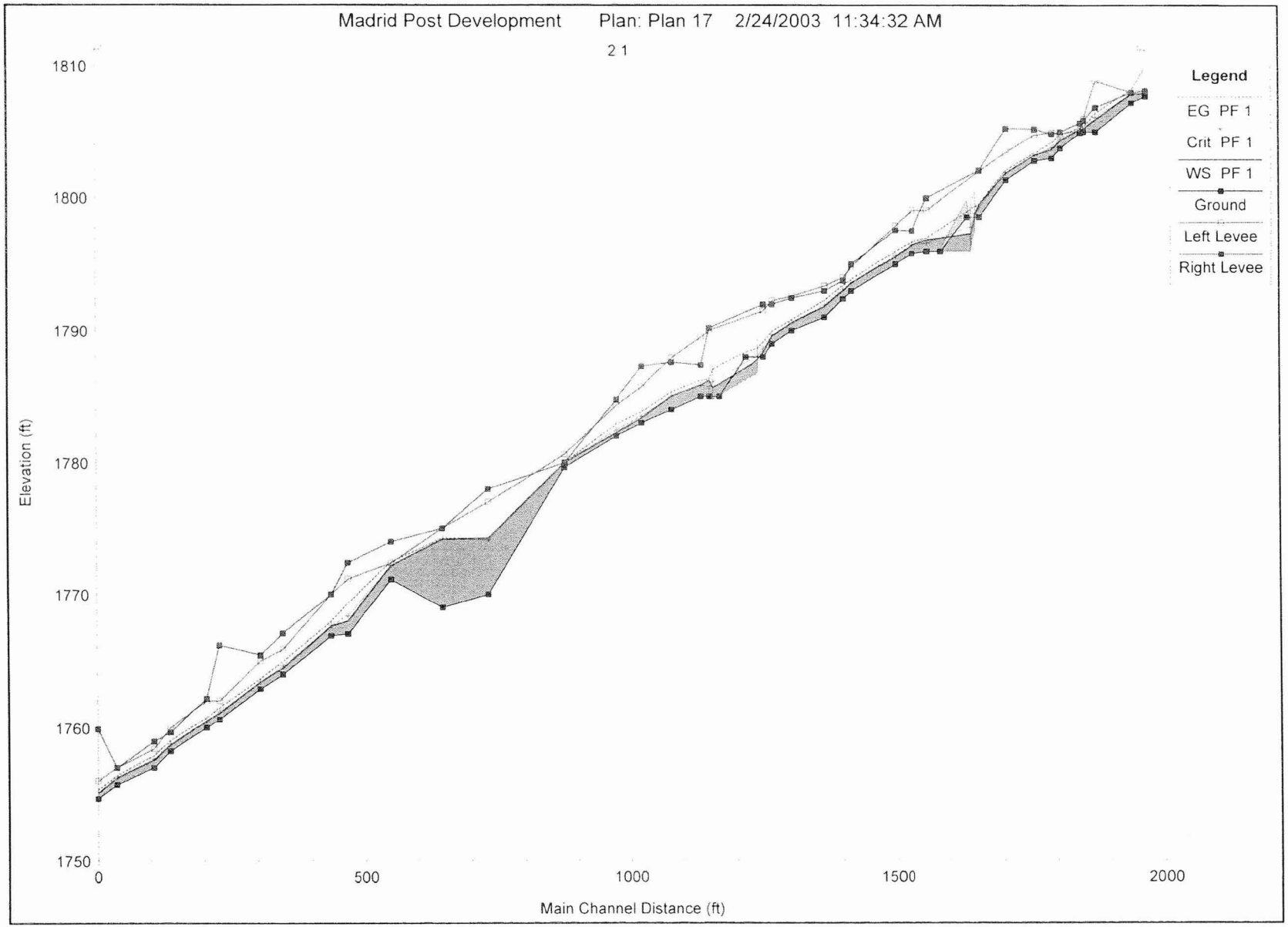
HEC-RAS Plan: Plan 16 River: 3 Reach: 1 Profile: PF 1

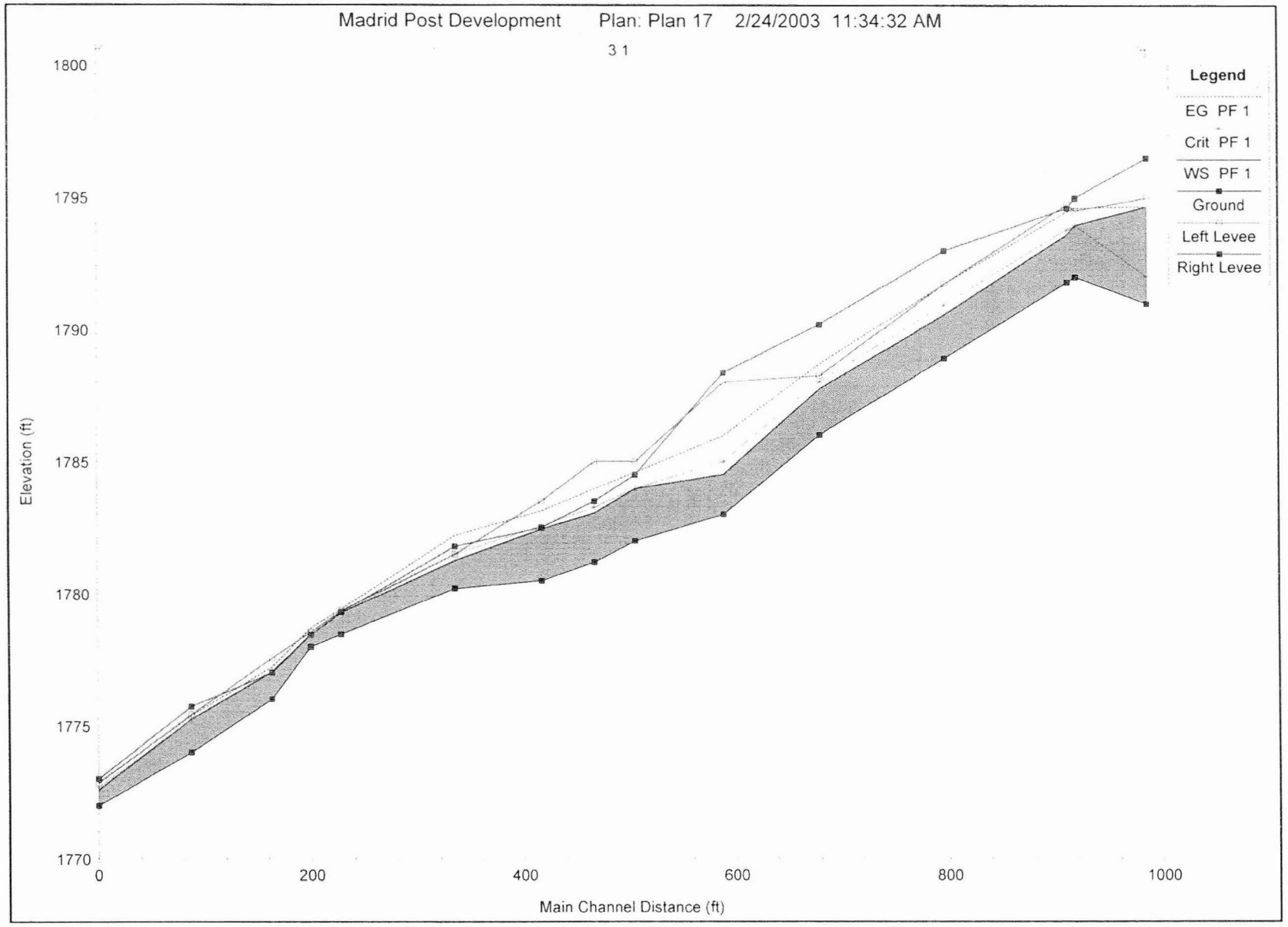
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	1125.331	PF 1	1.00	1791.00	1794.69	1792.03	1794.69	0.000000	0.00	594.25	184.43	0.00
1	1058.995	PF 1	126.90	1792.00	1793.99	1793.99	1794.63	0.013282	6.42	19.75	15.90	1.02
1	1051.387	PF 1	126.90	1791.81	1793.62	1793.81	1794.48	0.019659	7.42	17.09	14.87	1.22
1	936.023	PF 1	126.90	1788.93	1790.58	1790.94	1791.72	0.028963	8.57	14.81	13.92	1.46
1	819.468	PF 1	126.90	1786.01	1787.77	1788.02	1788.71	0.022371	7.79	16.29	14.55	1.30
1	728.193	PF 1	126.90	1783.00	1784.53	1785.00	1785.98	0.039976	9.65	13.15	13.18	1.70
1	644.92	PF 1	126.90	1782.00	1783.98	1783.98	1784.59	0.012886	6.29	20.16	16.40	1.00
1	606.323	PF 1	126.90	1781.20	1783.05	1783.26	1783.96	0.020097	7.65	16.60	13.94	1.23
1	556.14	PF 1	126.90	1780.50	1782.45	1782.55	1783.13	0.014335	6.61	19.21	15.70	1.05
1	471.466	PF 1	126.90	1780.20	1781.27	1781.50	1782.20	0.077271	7.74	16.39	38.62	2.09
1	364.861	PF 1	126.90	1778.45	1779.27	1779.27	1779.42	0.019780	3.09	41.12	139.40	1.00
1	336.632	PF 1	126.90	1777.97	1778.44	1778.45	1778.69	0.034442	4.06	31.29	106.80	1.32
1	300.264	PF 1	126.90	1776.00	1777.03	1777.08	1777.22	0.046071	3.50	37.17	205.17	1.42
1	224.213	PF 1	126.90	1774.00	1775.25	1775.25	1775.39	0.020608	2.93	43.37	164.14	1.00
1	136.862	PF 1	126.90	1772.00	1772.61	1772.69	1772.88	0.041687	4.21	30.12	111.96	1.43

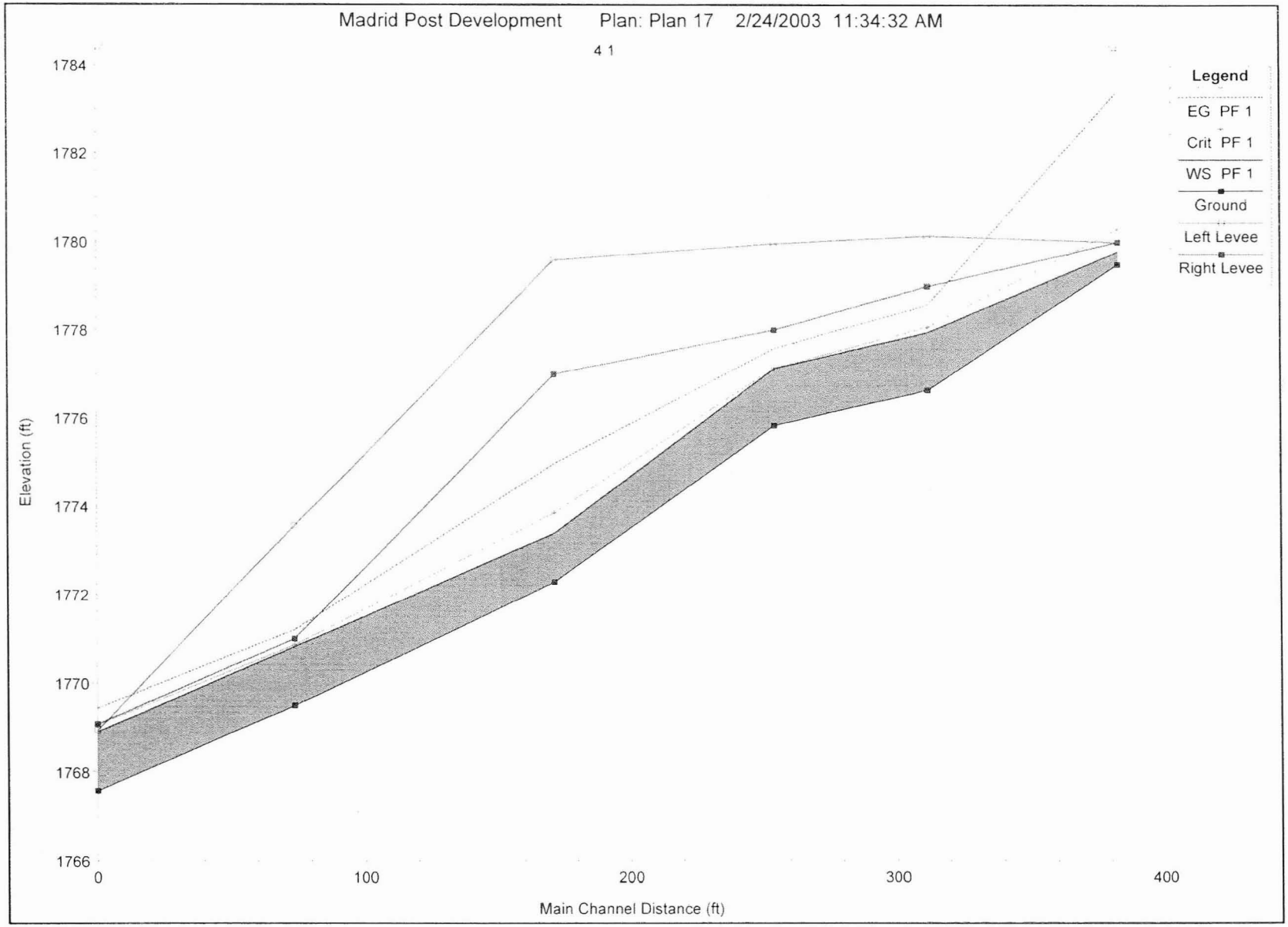
HEC-RAS Plan: Plan 16 River: 4 Reach: 1 Profile: PF 1

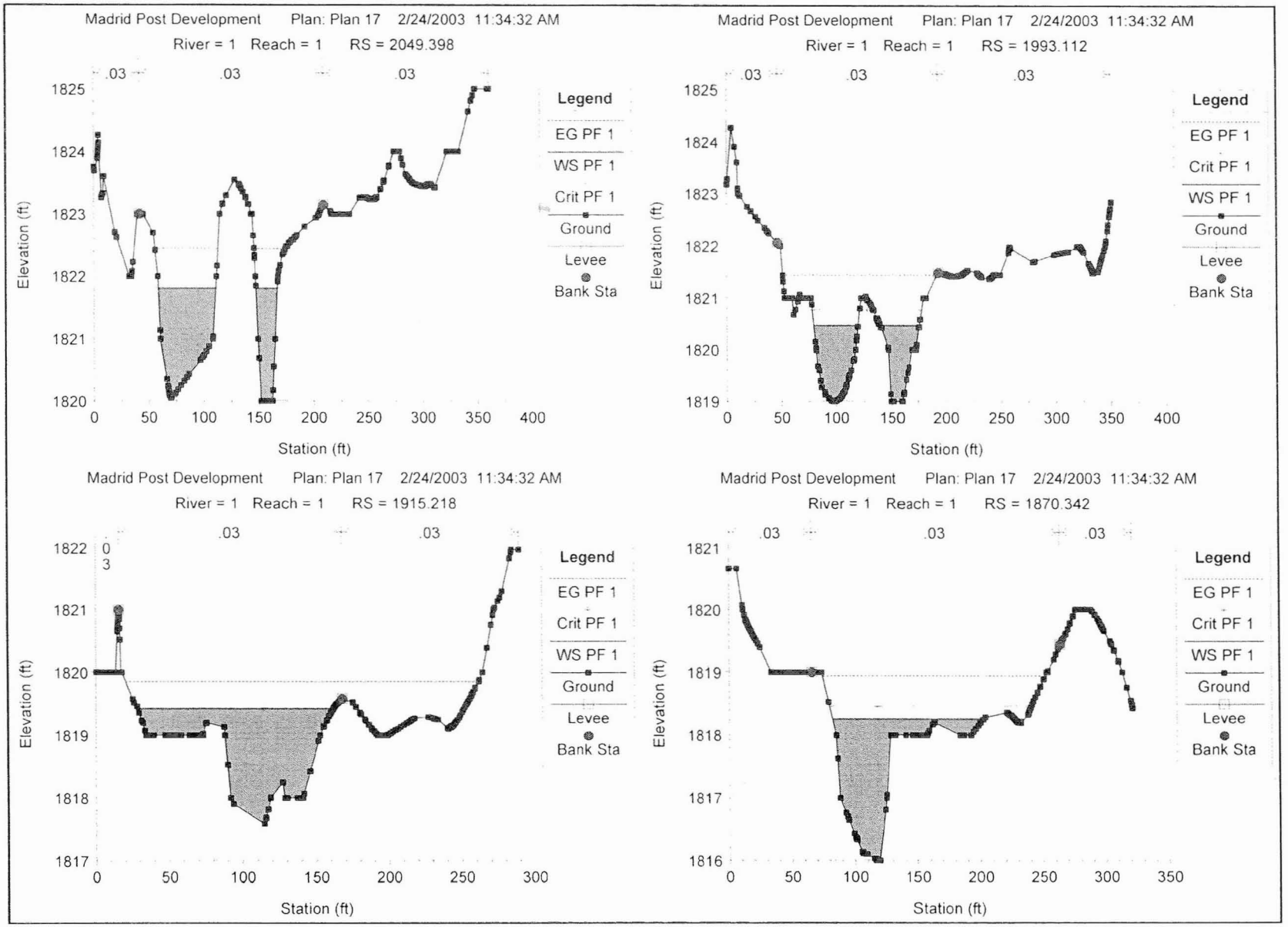
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	441.375	PF 1	205.97	1779.50	1779.79	1780.29	1783.42	0.575936	15.29	13.48	51.95	5.29
1	370.522	PF 1	205.97	1776.64	1777.96	1778.07	1778.57	0.019519	6.30	32.70	37.19	1.18
1	313.035	PF 1	205.97	1775.84	1777.13	1777.14	1777.58	0.013992	5.38	38.30	42.88	1.00
1	229.830	PF 1	205.97	1772.28	1773.40	1773.85	1774.98	0.103644	10.09	20.42	40.48	2.50
1	132.433	PF 1	205.97	1769.50	1770.83	1770.87	1771.21	0.017430	4.93	41.79	63.77	1.07
1	58.395	PF 1	205.97	1767.58	1768.91	1769.06	1769.44	0.034243	5.86	35.16	68.61	1.44

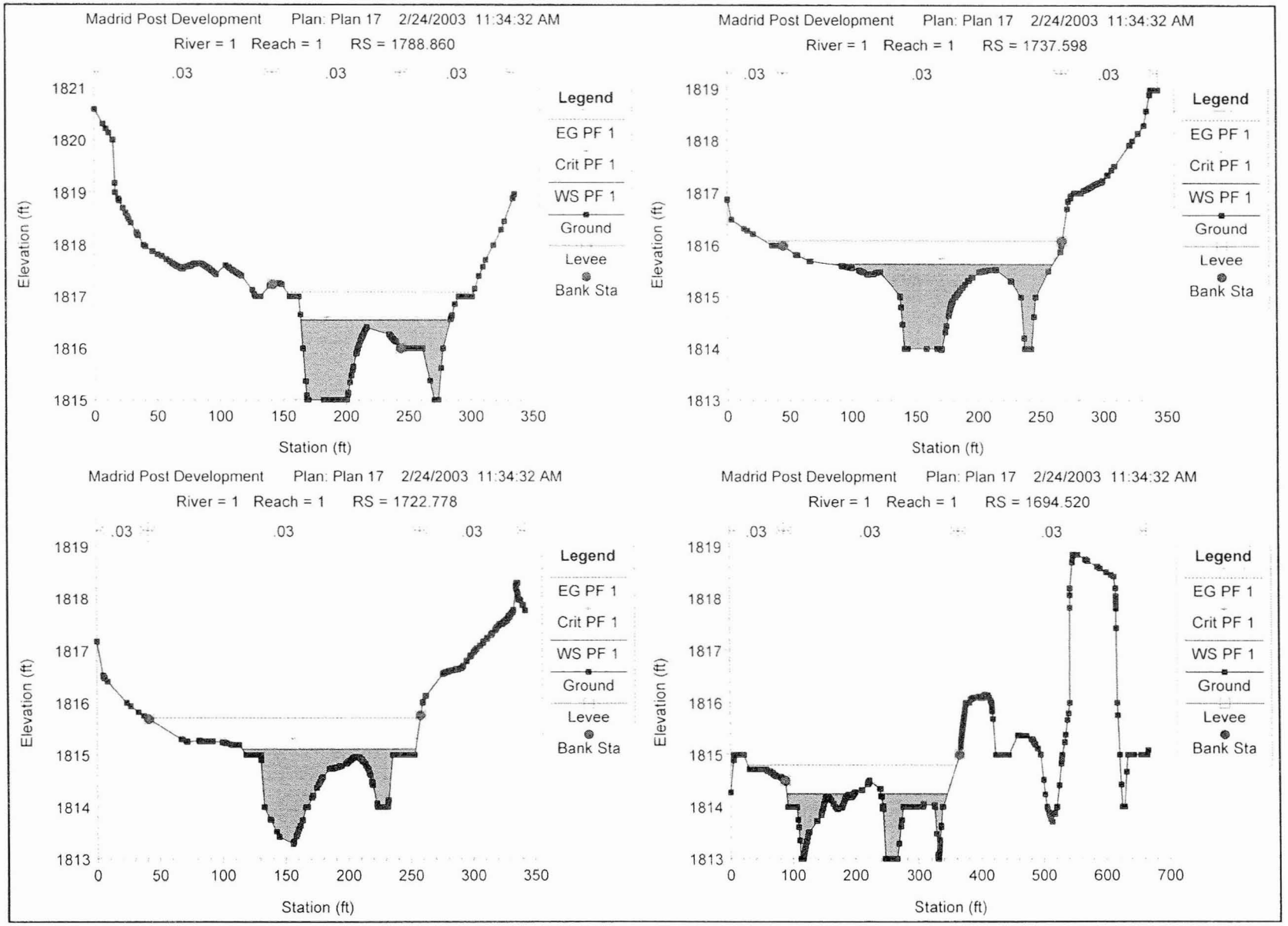

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
1 3
1 2
1 1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Left Levee
Right Levee
Elevation (ft)
1830
1820
1810
1800
1790
1780
1770
0
500
1000
1500
2000
Main Channel Distance (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
2 1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Left Levee
Right Levee
Elevation (ft)
1810
1800
1790
1780
1770
1760
1750
0
500
1000
1500
2000
Main Channel Distance (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
3 1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Left Levee
Right Levee
Elevation (ft)
1800
1795
1790
1785
1780
1775
1770
0
200
400
600
800
1000
Main Channel Distance (ft)

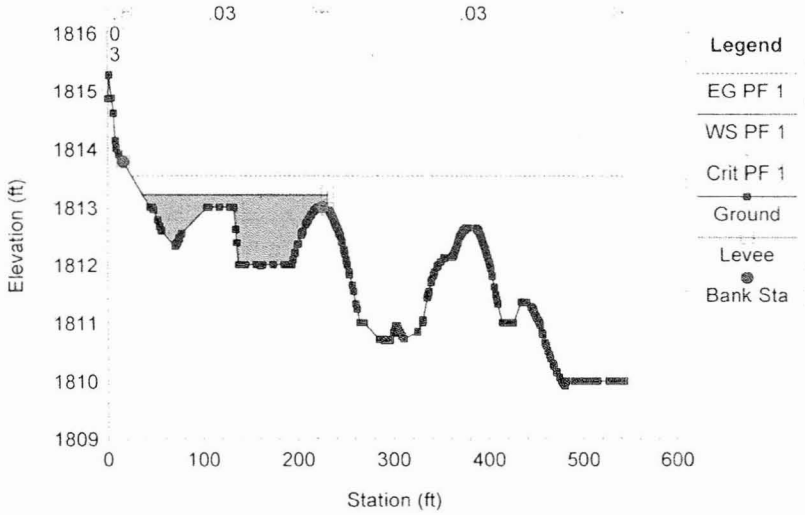

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
4 1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Left Levee
Right Levee
Elevation (ft)
1784
1782
1780
1778
1776
1774
1772
1770
1768
1766
0
100
200
300
400
Main Channel Distance (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 2049.398
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1993.112
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1915.218
.03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1870.342
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1788.860
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1737.598
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1722.778
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 1694.520
.03 .03 .03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta

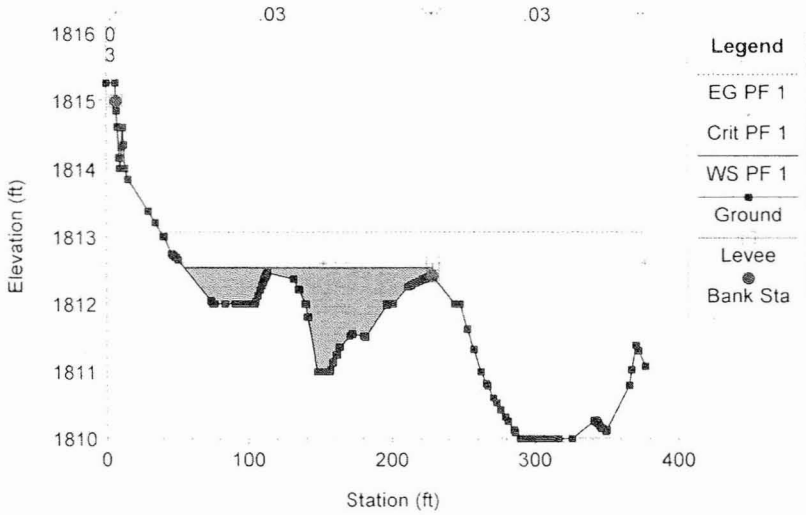
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 1 RS = 1623.853 Levee raised above existing ground since overflow will be minima



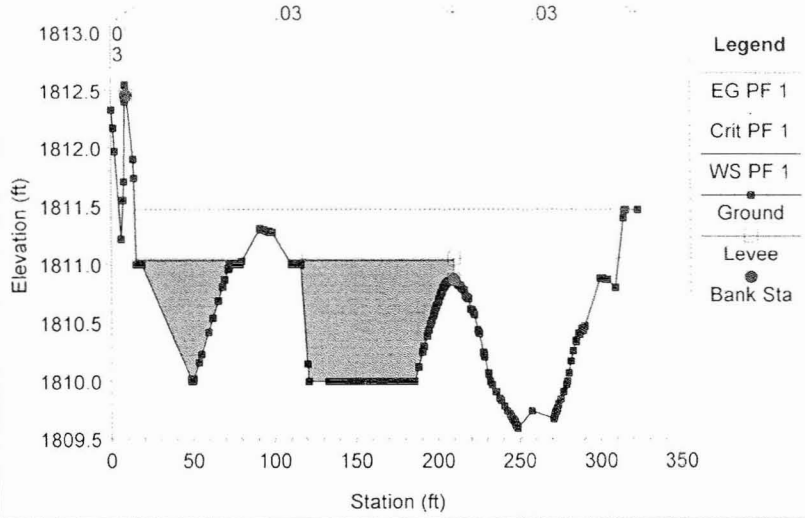
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 1 RS = 1601.345 Levee raised above existing ground since overflow will be minima



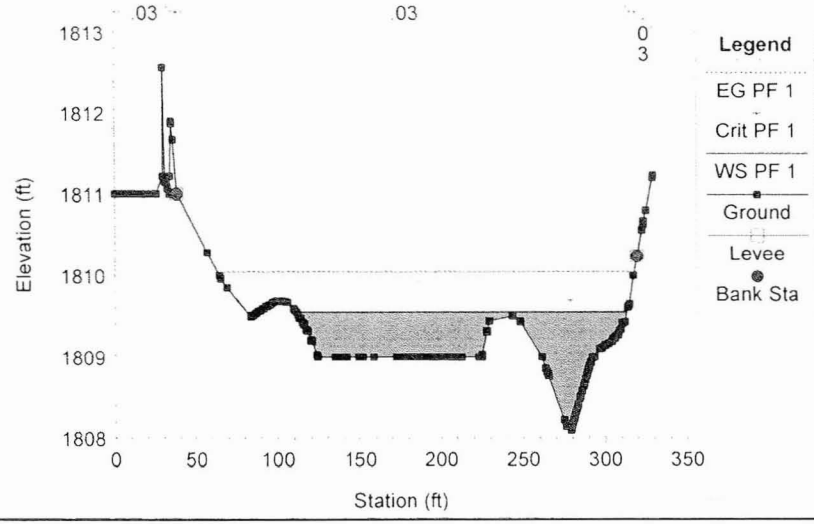
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 1 RS = 1534.173 Levee raised above existing ground since overflow will be minima



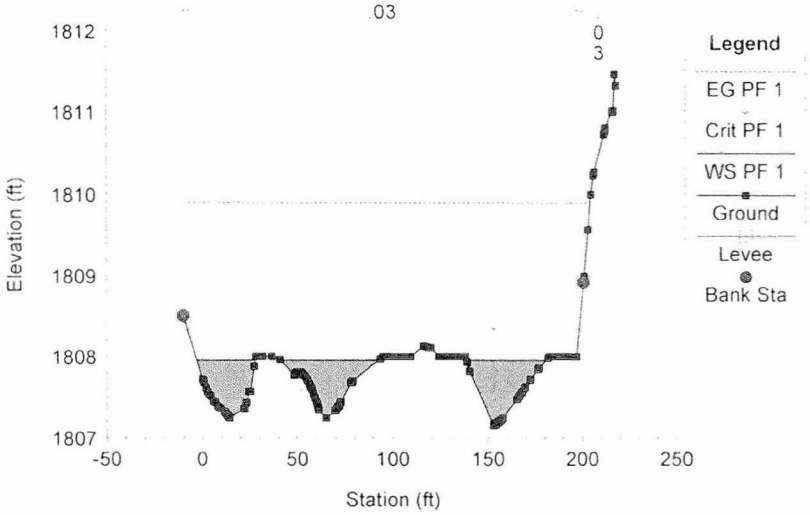
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 1 RS = 1476.548



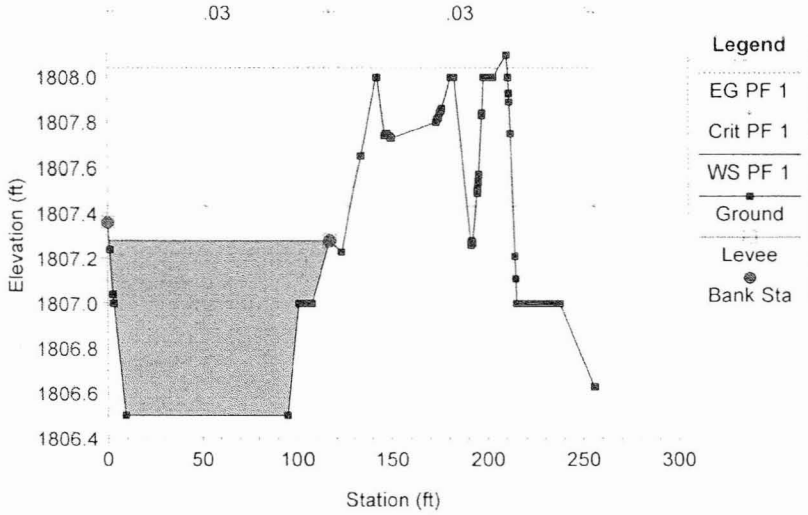
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1403.497 Extrapolated to -10 station to contain full flow



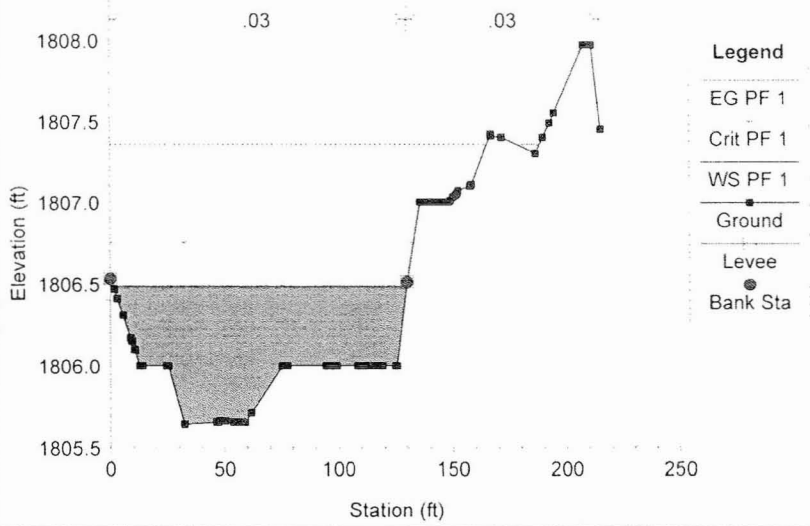
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1381.105 Lowered 0.5 btwn sta 10 and 100 to prevent overspill into adjace



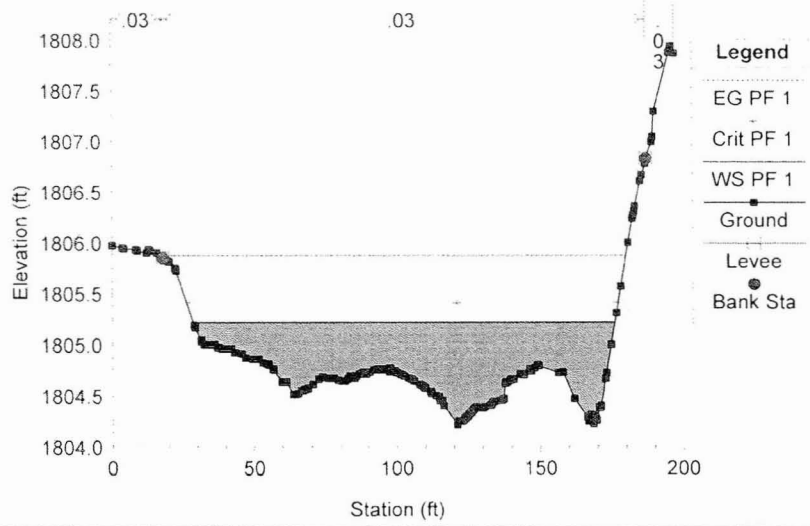
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

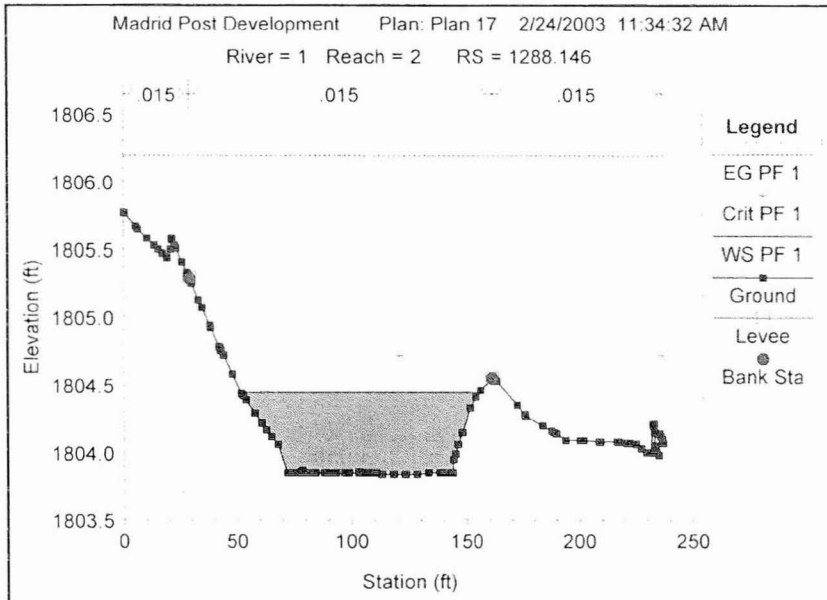
River = 1 Reach = 2 RS = 1329.952

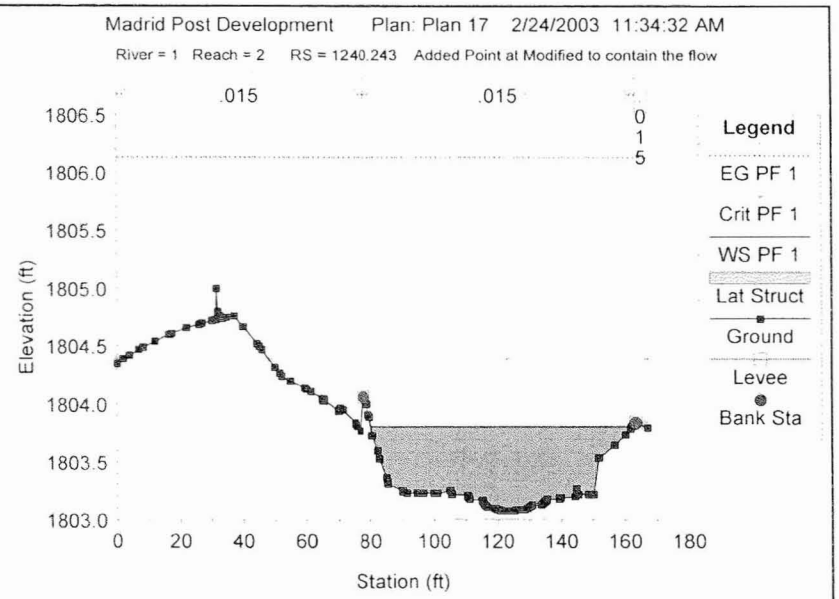


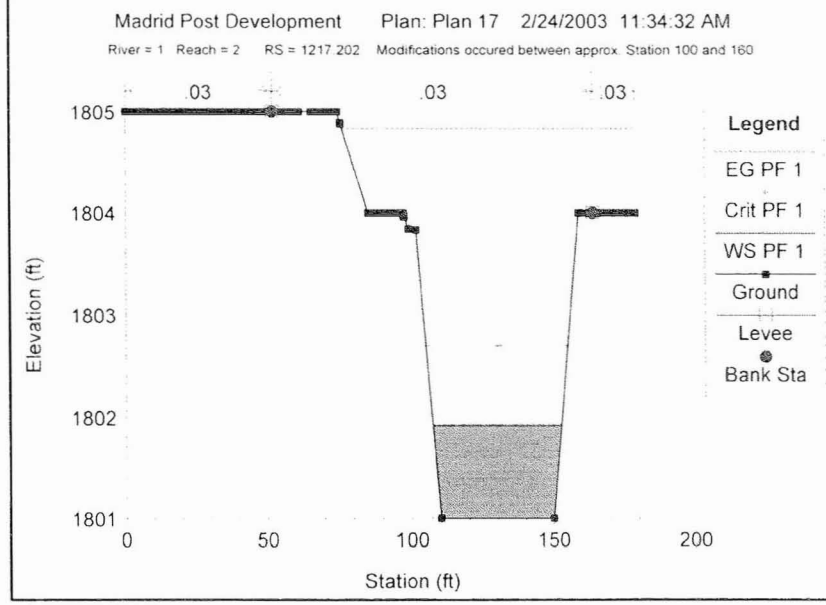
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

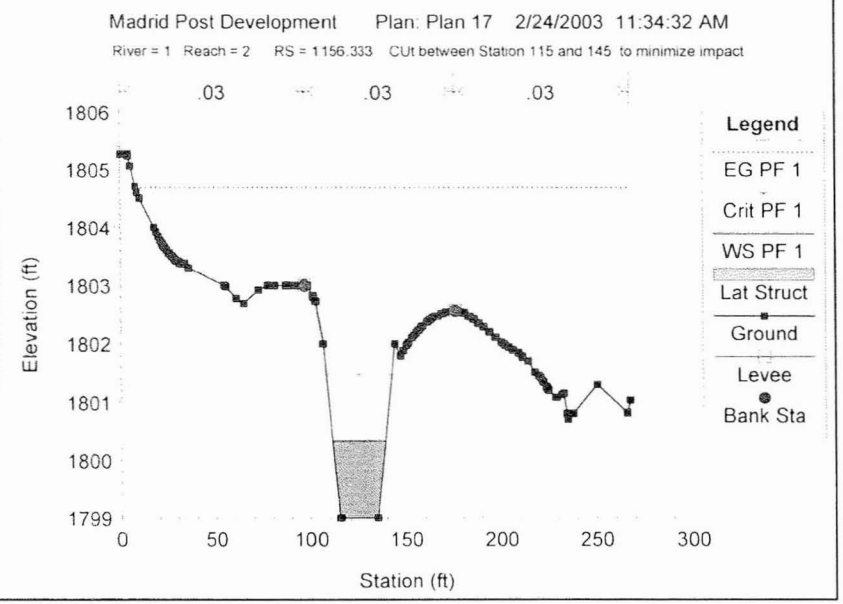
River = 1 Reach = 2 RS = 1296.727




Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 1288.146
.015
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

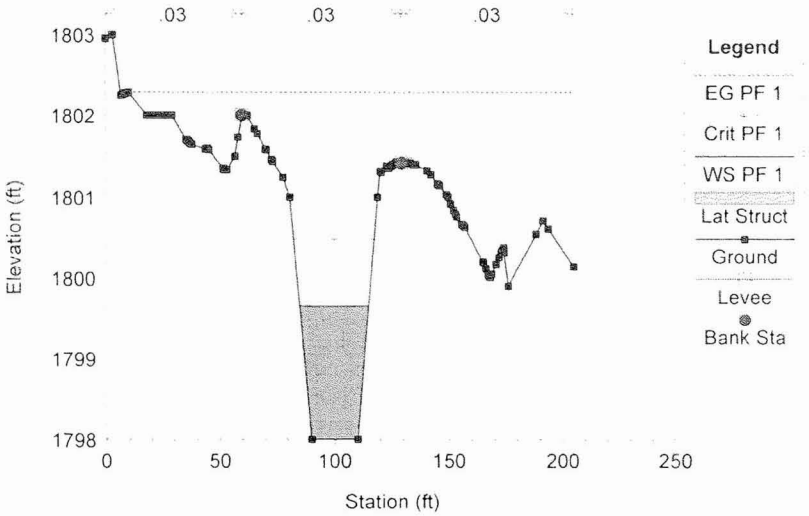

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 1240.243 Added Point at Modified to contain the flow
.015
.015
0
1
5
Legend
EG PF 1
Crit PF 1
WS PF 1
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 1217.202 Modifications occured between approx. Station 100 and 160
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 1156.333 CUt between Station 115 and 145 to minimize impact
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

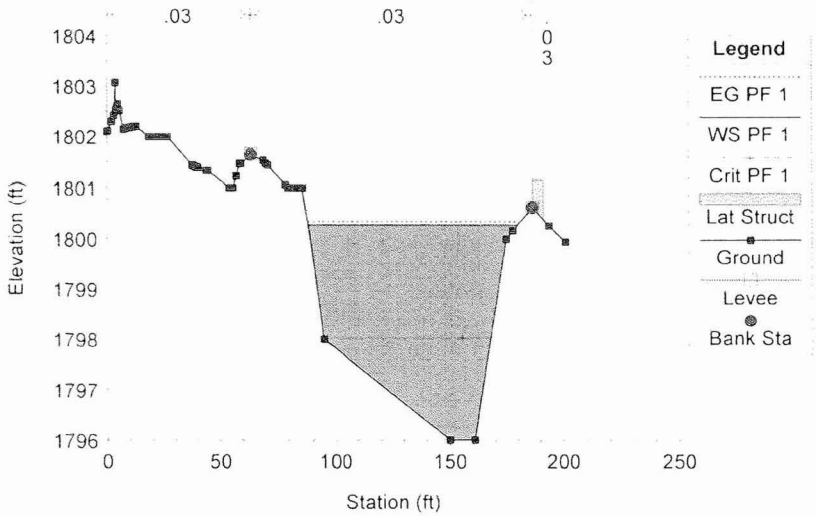
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1127.157 DEEPENED between Sta 80 & 120 ro prevent overflow onto road



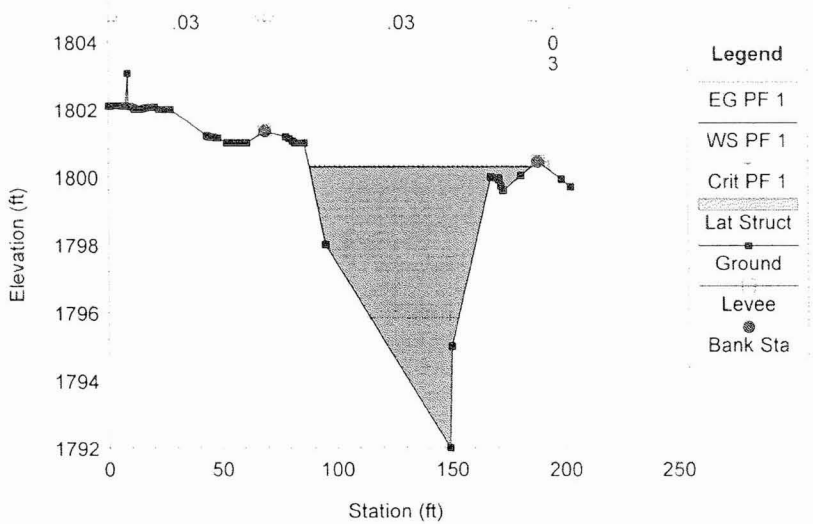
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1121.867 Deppened to prevent overflow on road btwn sta 90 and 150



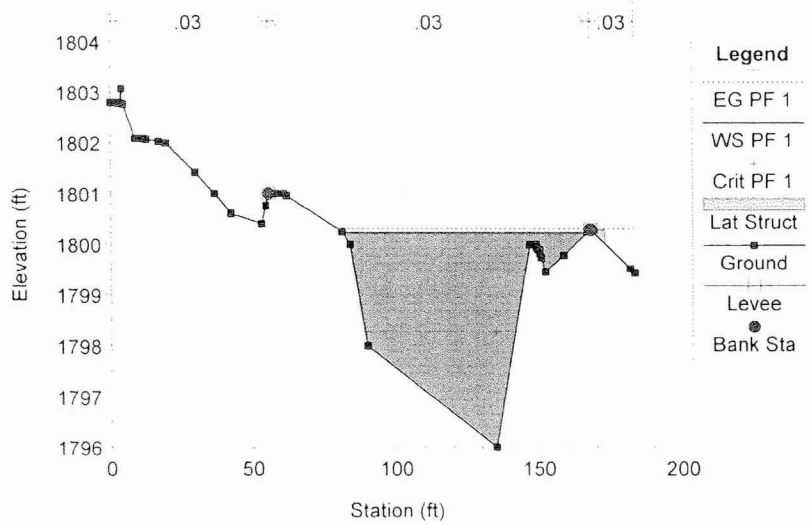
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1118.328 Section at Culvert. Cut Channel from Station 90 to 165



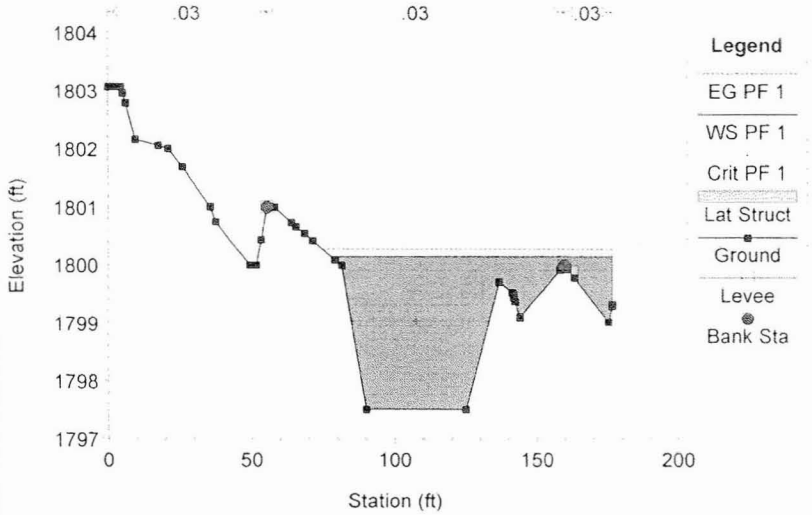
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1101.519 Modified from sta 90 to station 145



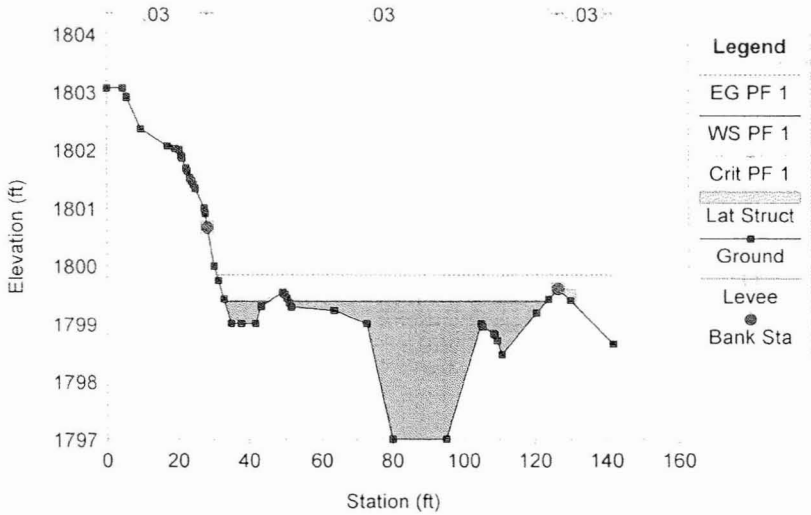
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1091.588 Modified frrom 80 to 135



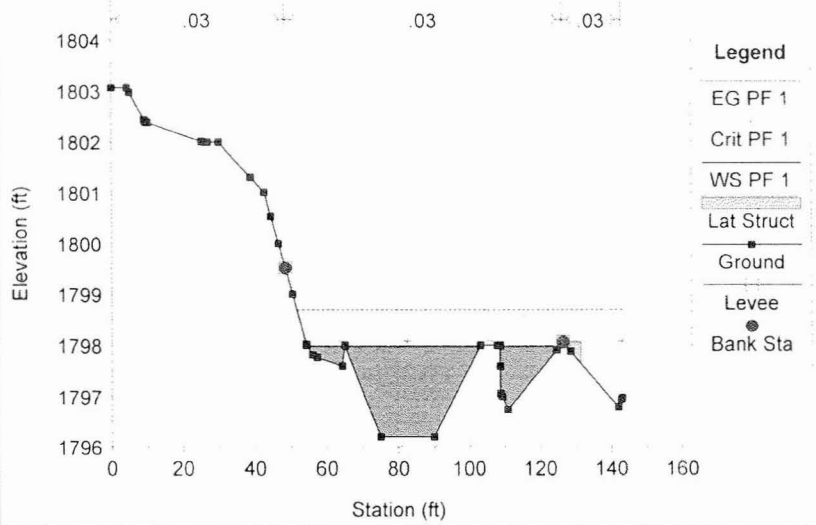
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 1 Reach = 2 RS = 1053.249 Modified from station 75 to 105 to contain flow



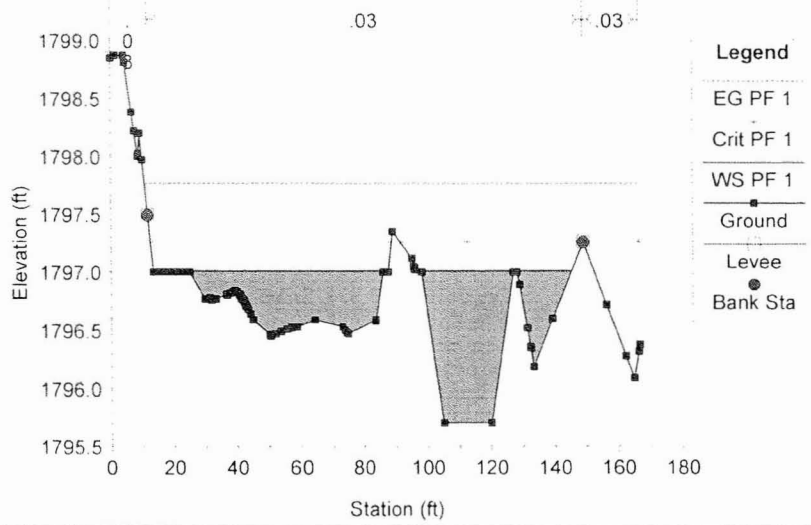
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

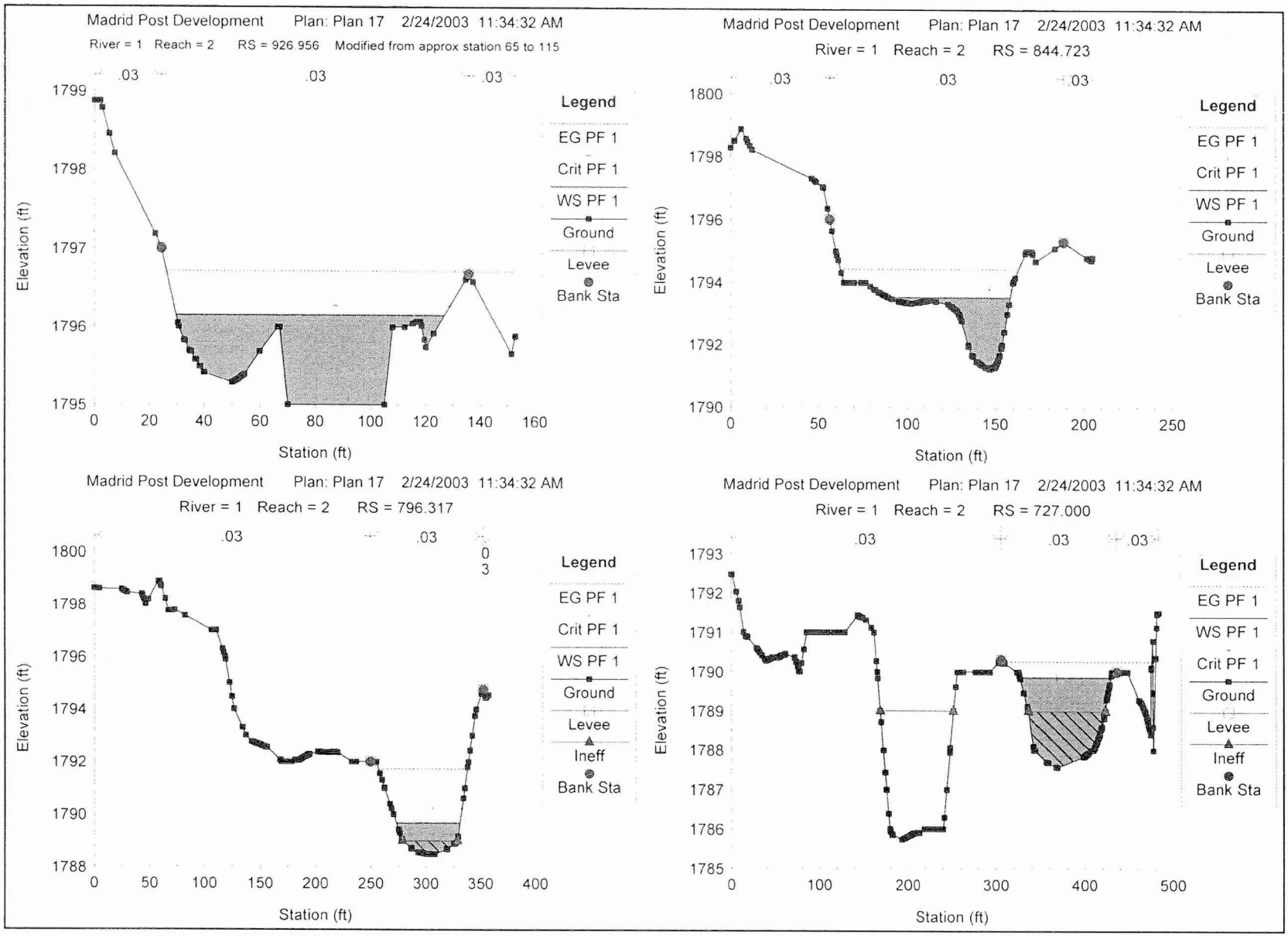
River = 1 Reach = 2 RS = 986.395 Deepened frorm approx 65 to 100

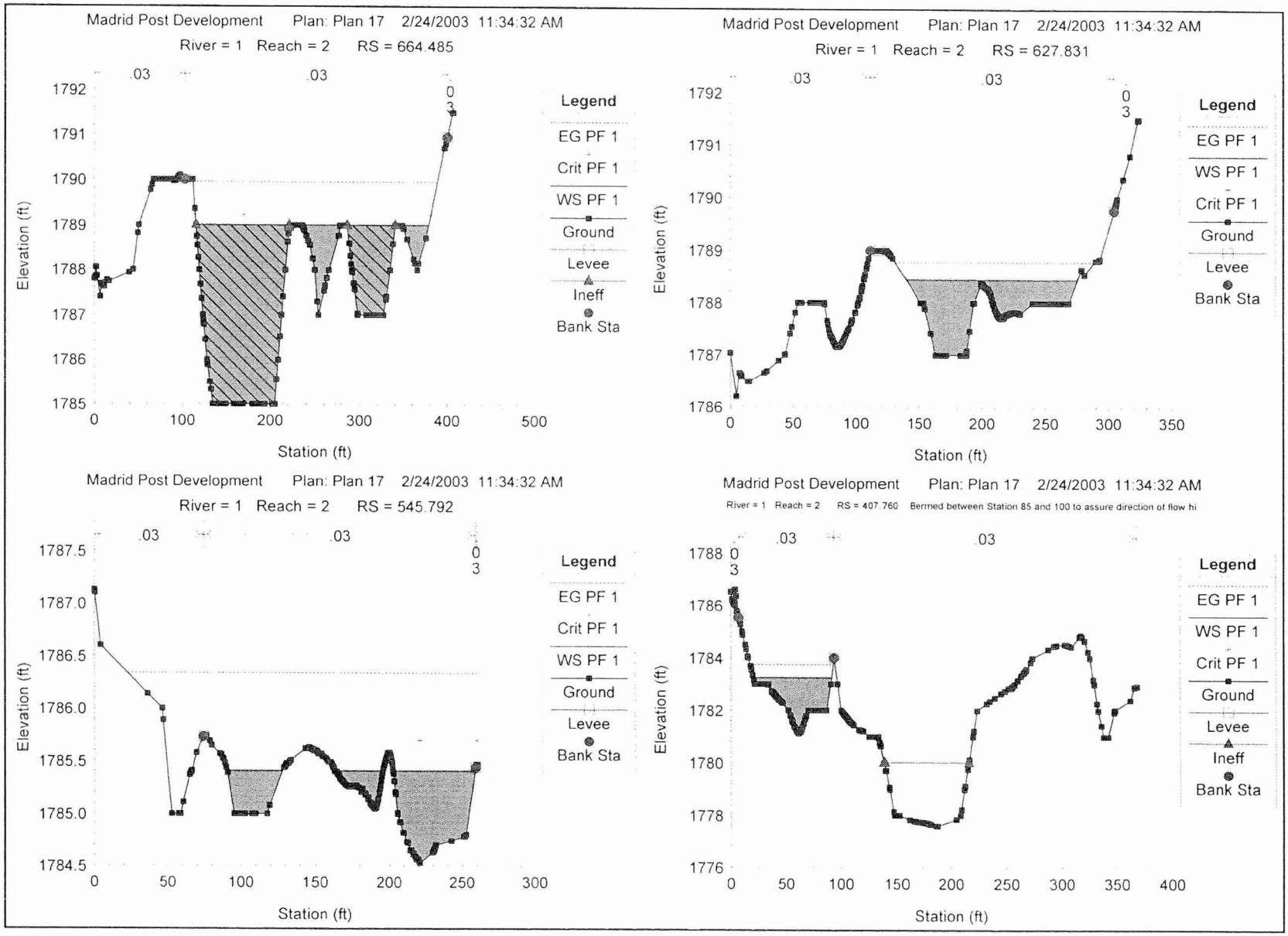


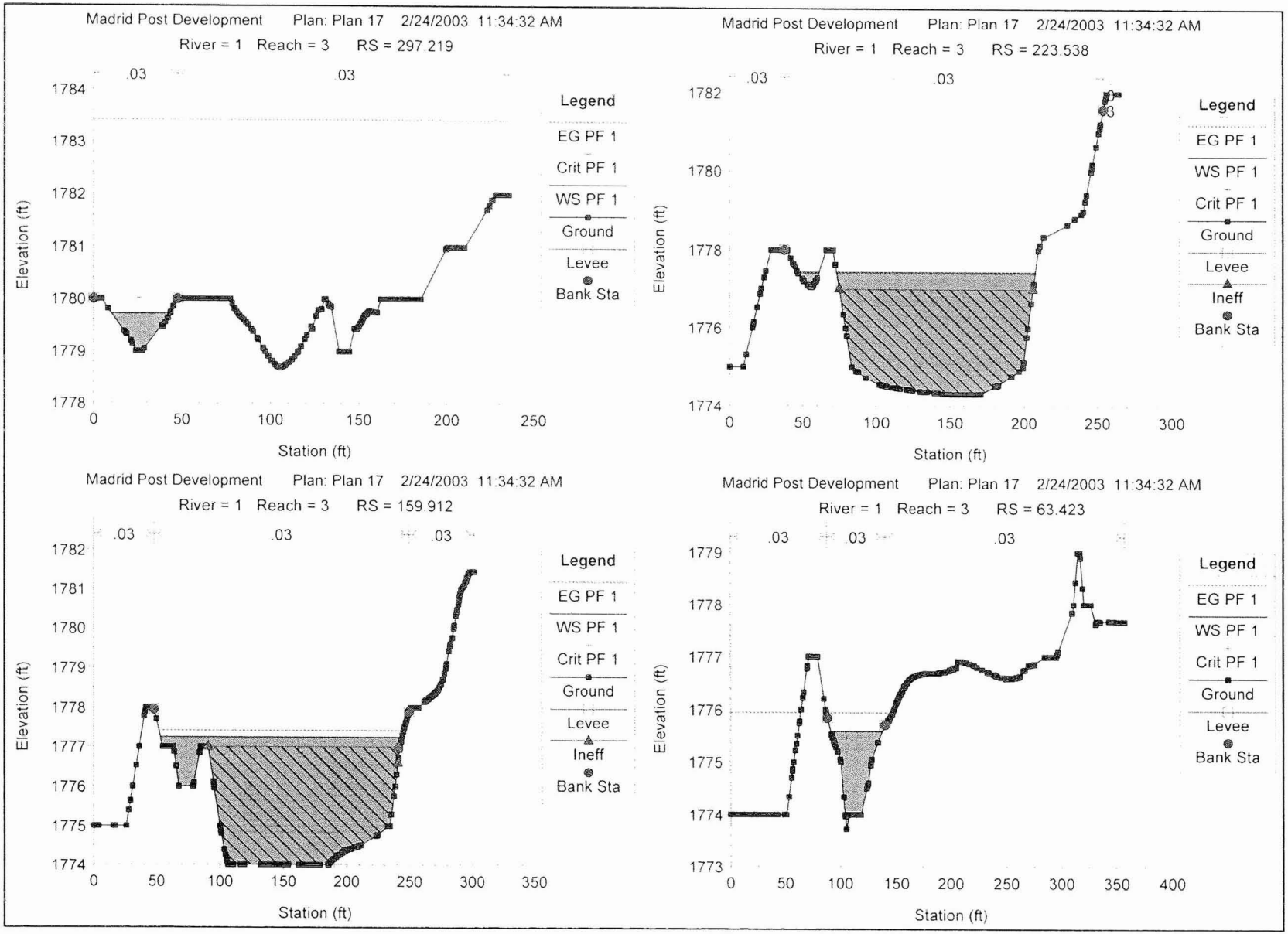
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

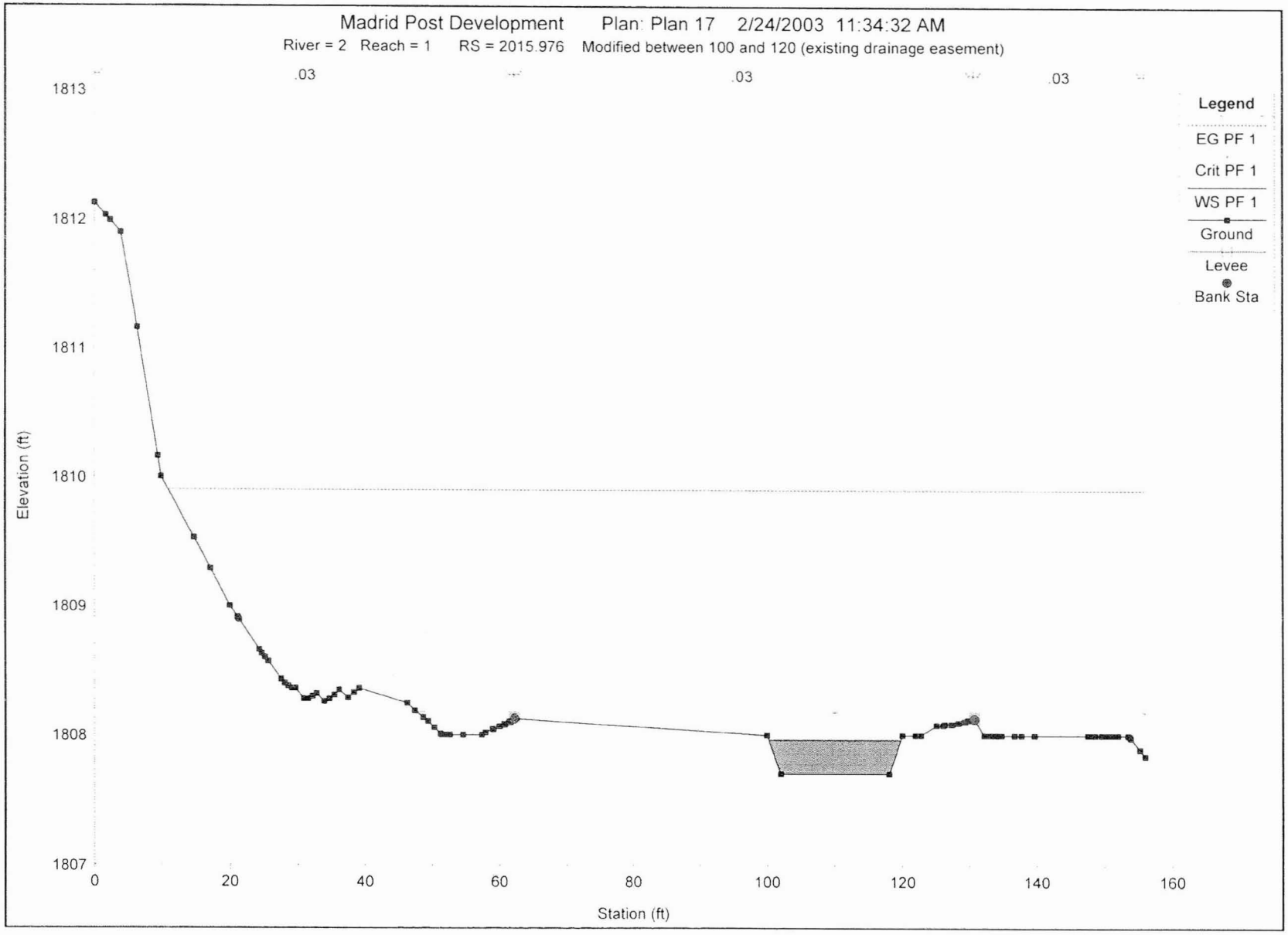
River = 1 Reach = 2 RS = 956.934 Deepened from approx station 100 to 130

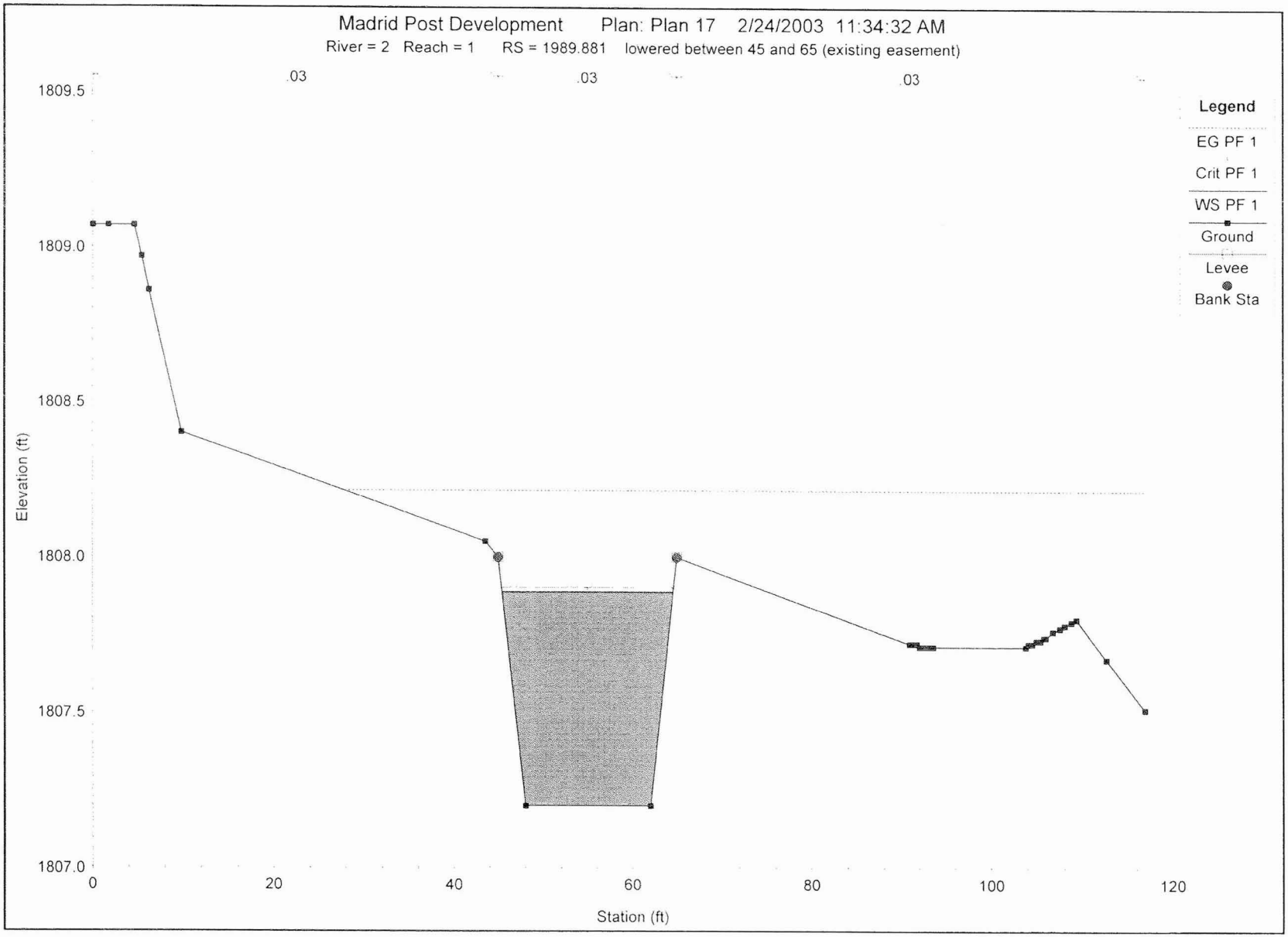


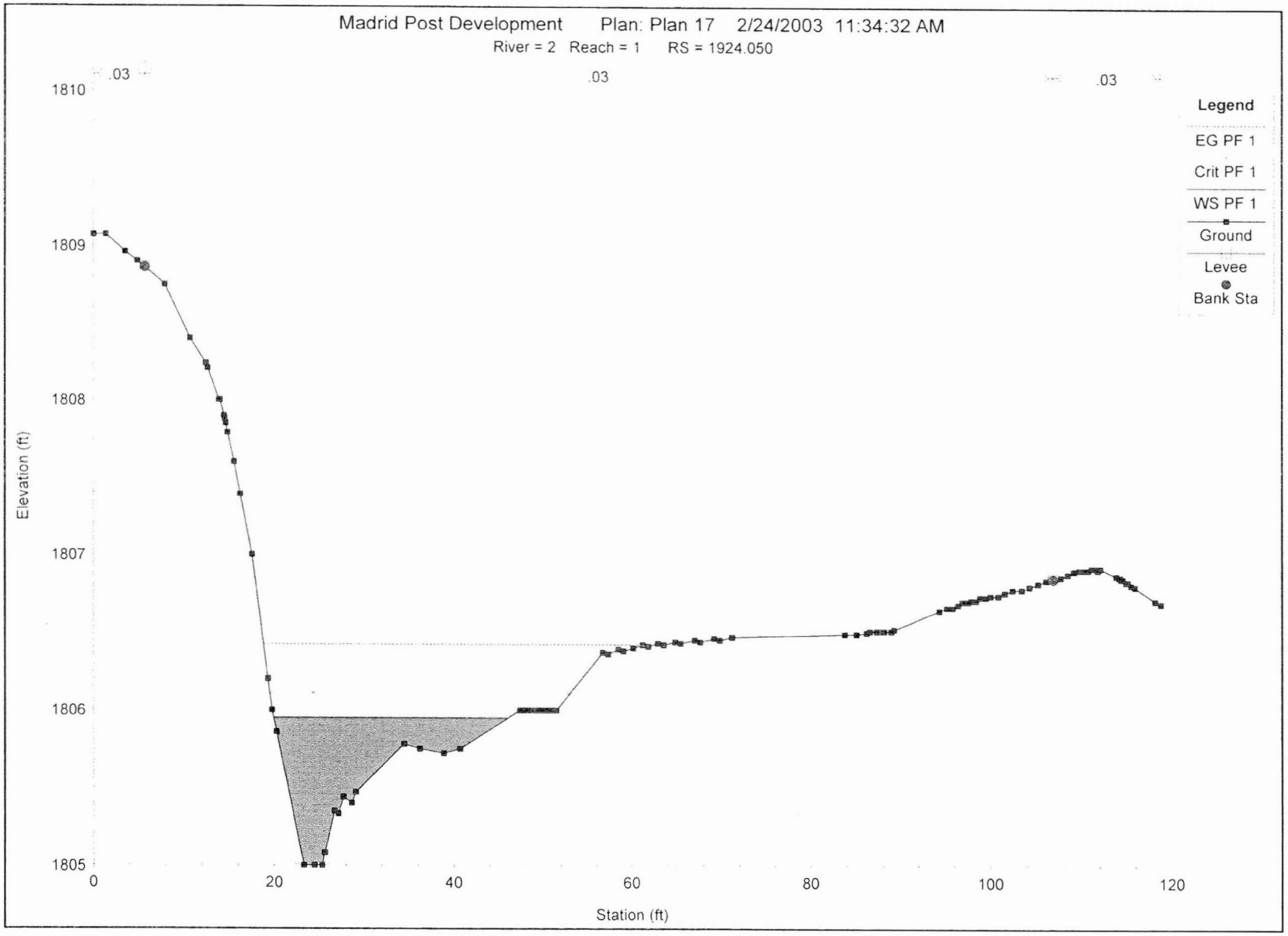

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 926.956 Modified from approx station 65 to 115
.03 .03 .03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 844.723
.03 .03 .03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 796.317
.03 .03 .03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 727.000
.03 .03 .03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

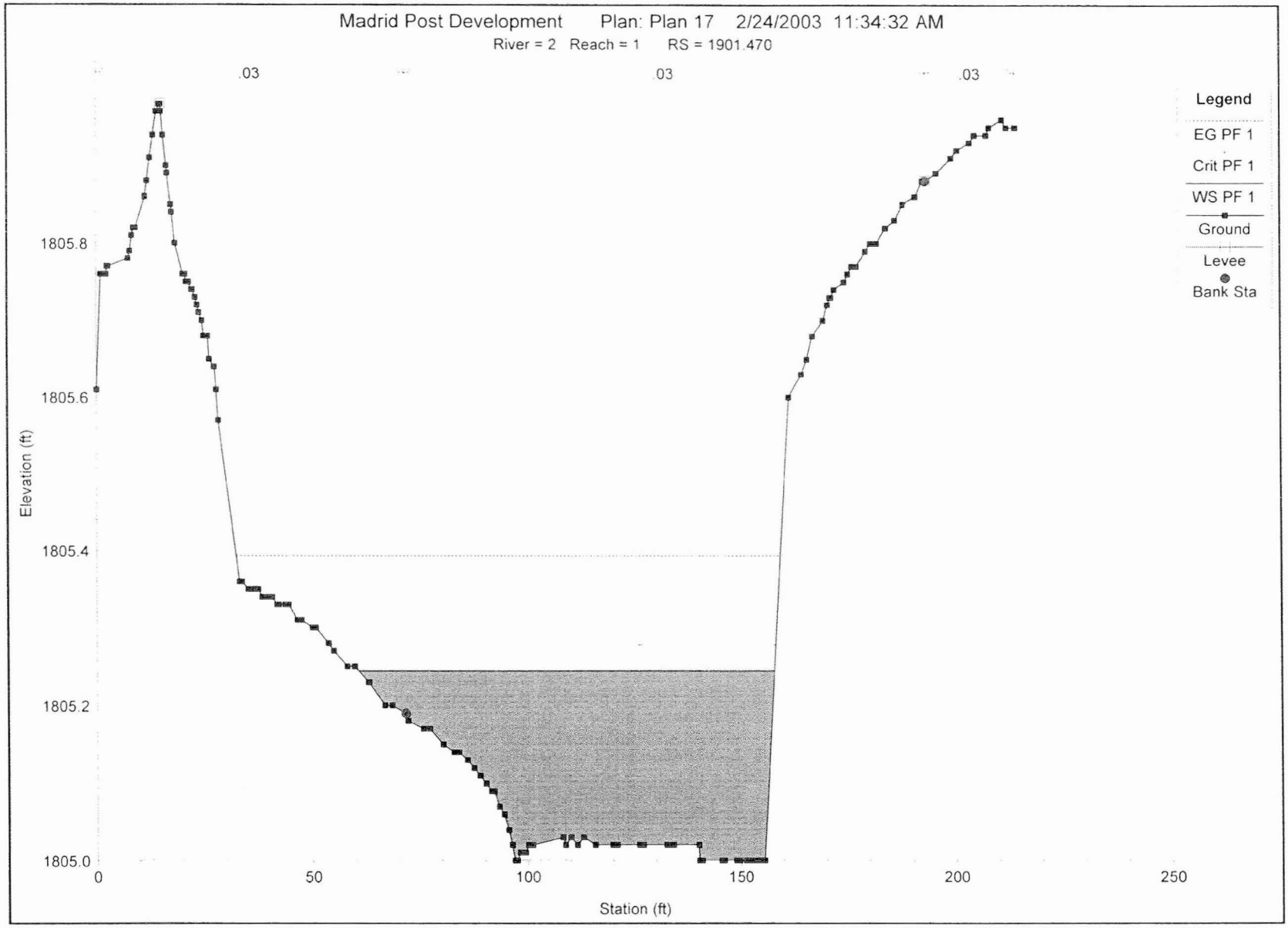

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 664.485
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Ineff
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 627.831
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 545.792
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 2 RS = 407.760 Bermed between Station 85 and 100 to assure direction of flow hi
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta

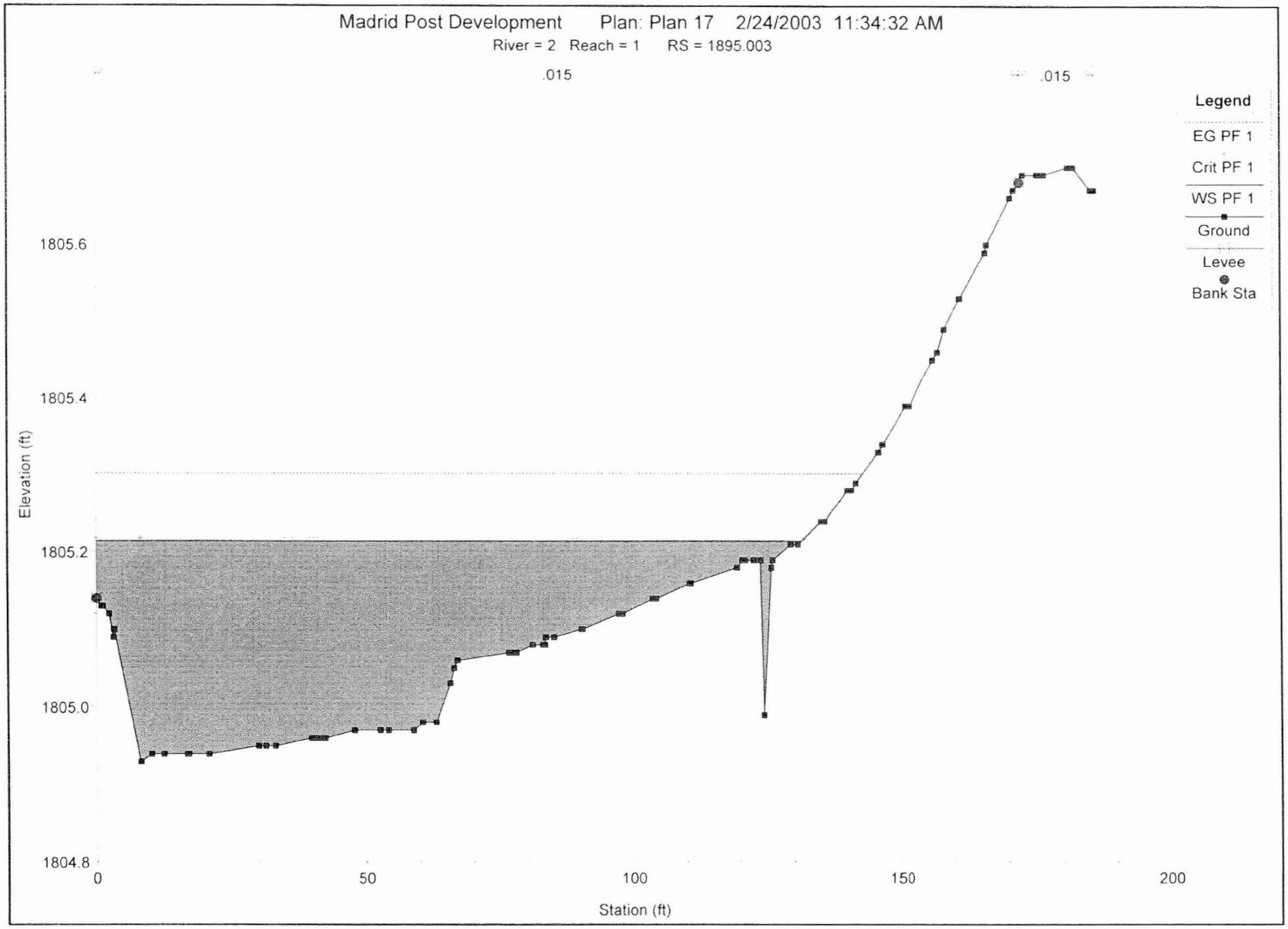

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 3 RS = 297.219
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 3 RS = 223.538
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 3 RS = 159.912
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 3 RS = 63.423
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

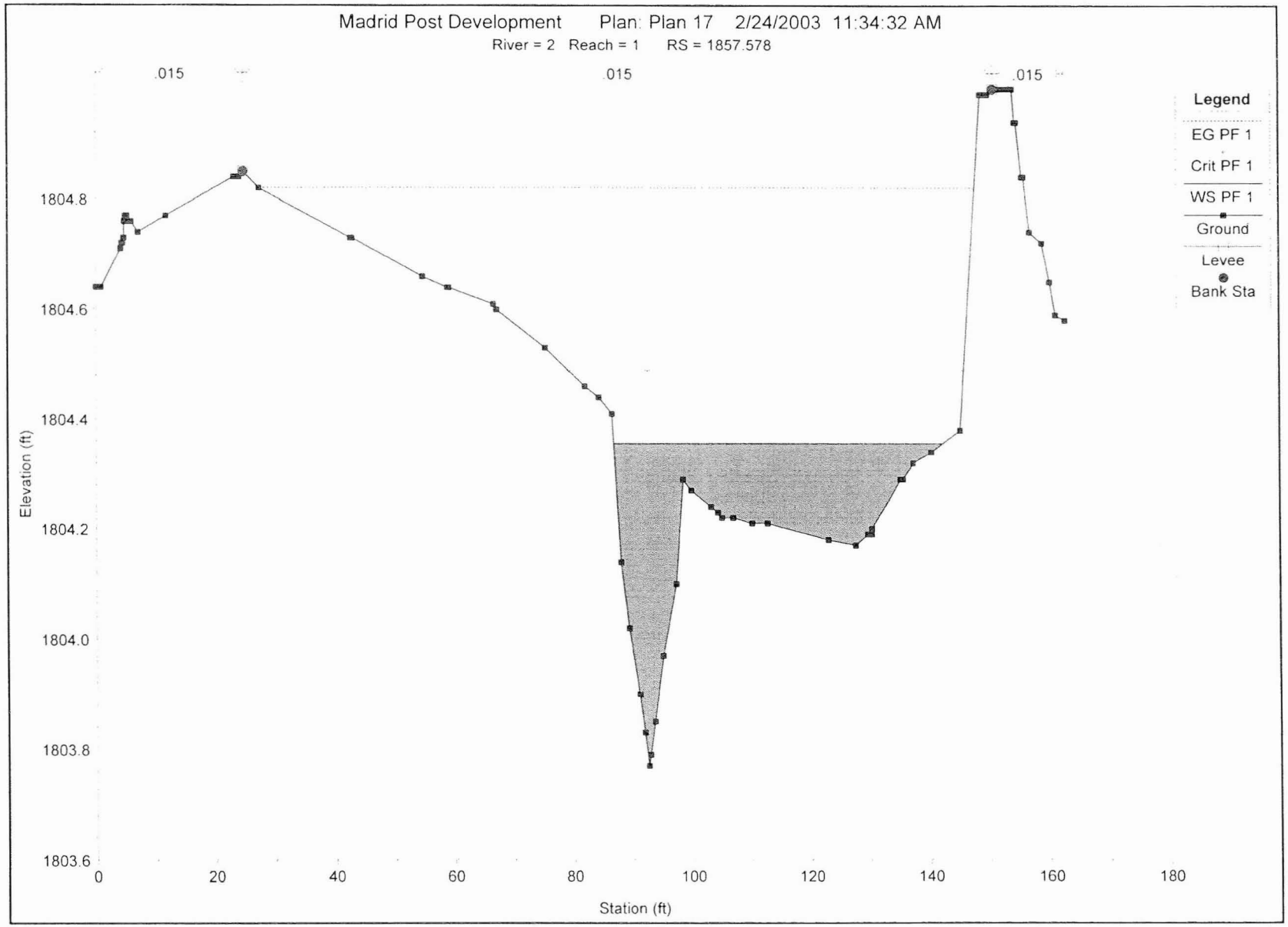

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 2015.976 Modified between 100 and 120 (existing drainage easement)
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1813
1812
1811
1810
1809
1808
1807
0
20
40
60
80
100
120
140
160
Station (ft)

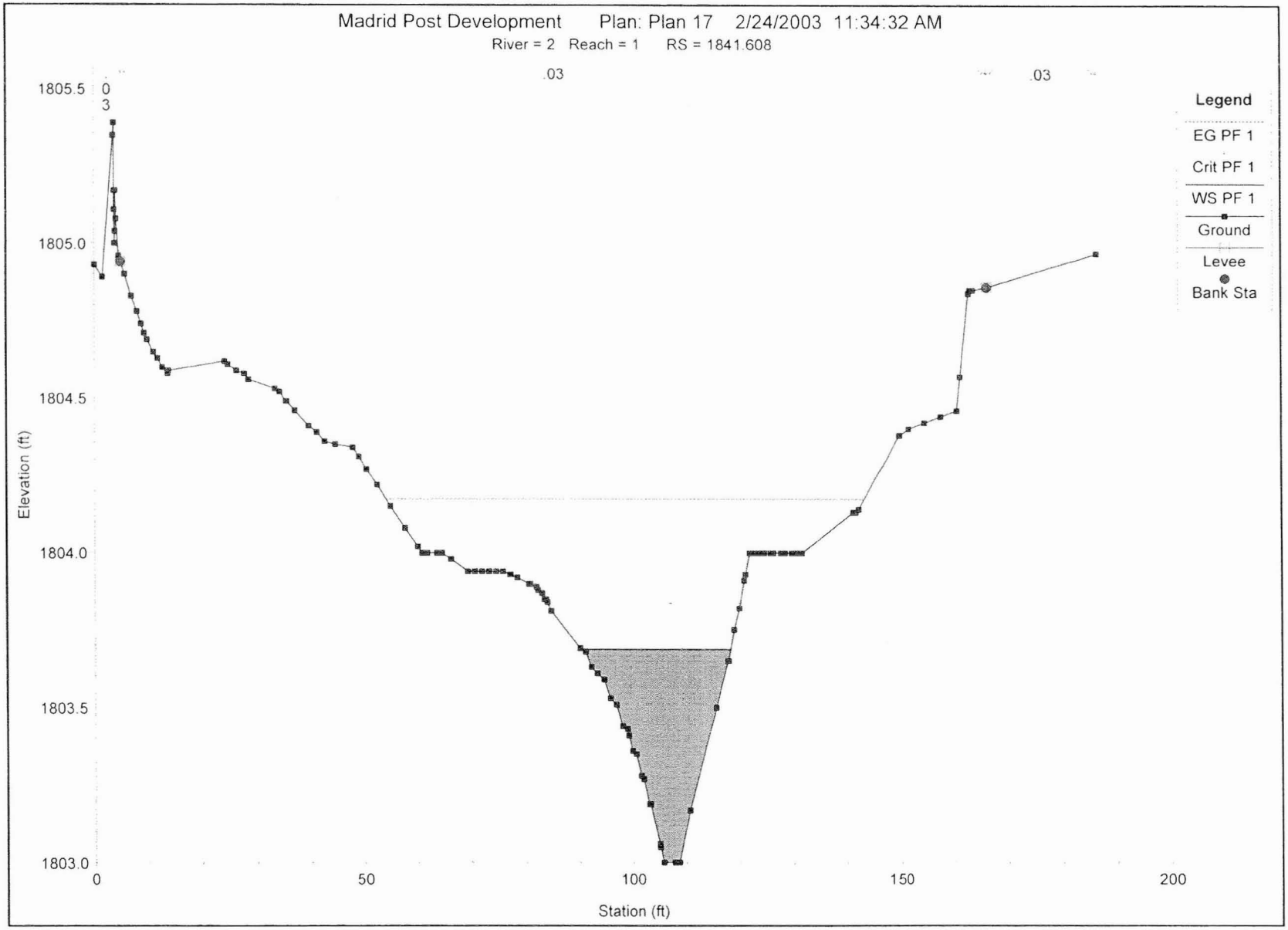

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1989.881 lowered between 45 and 65 (existing easement)
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1809.5
1809.0
1808.5
1808.0
1807.5
1807.0
0
20
40
60
80
100
120
Station (ft)

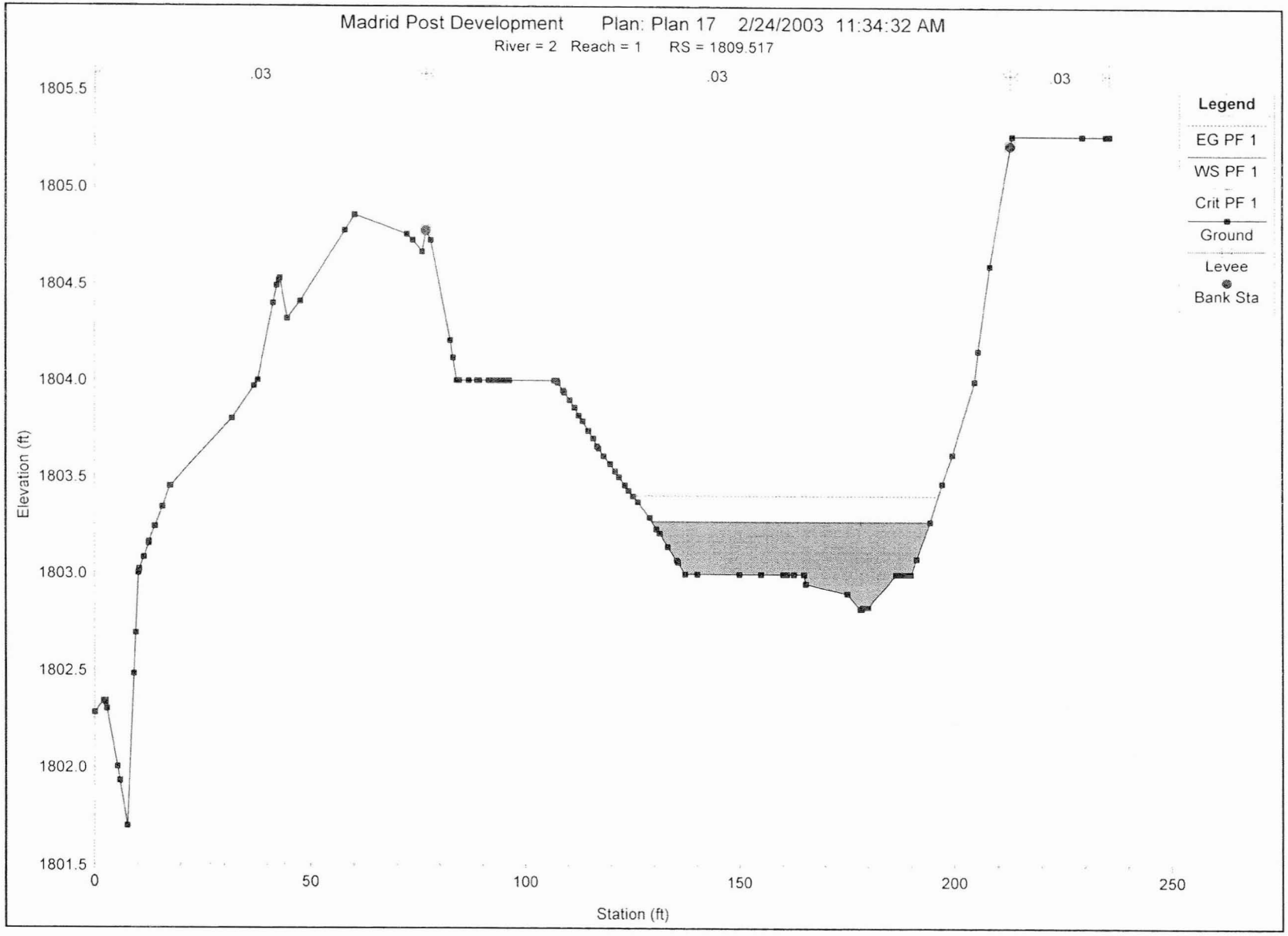

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1924.050
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1810
1809
1808
1807
1806
1805
0
20
40
60
80
100
120
Station (ft)

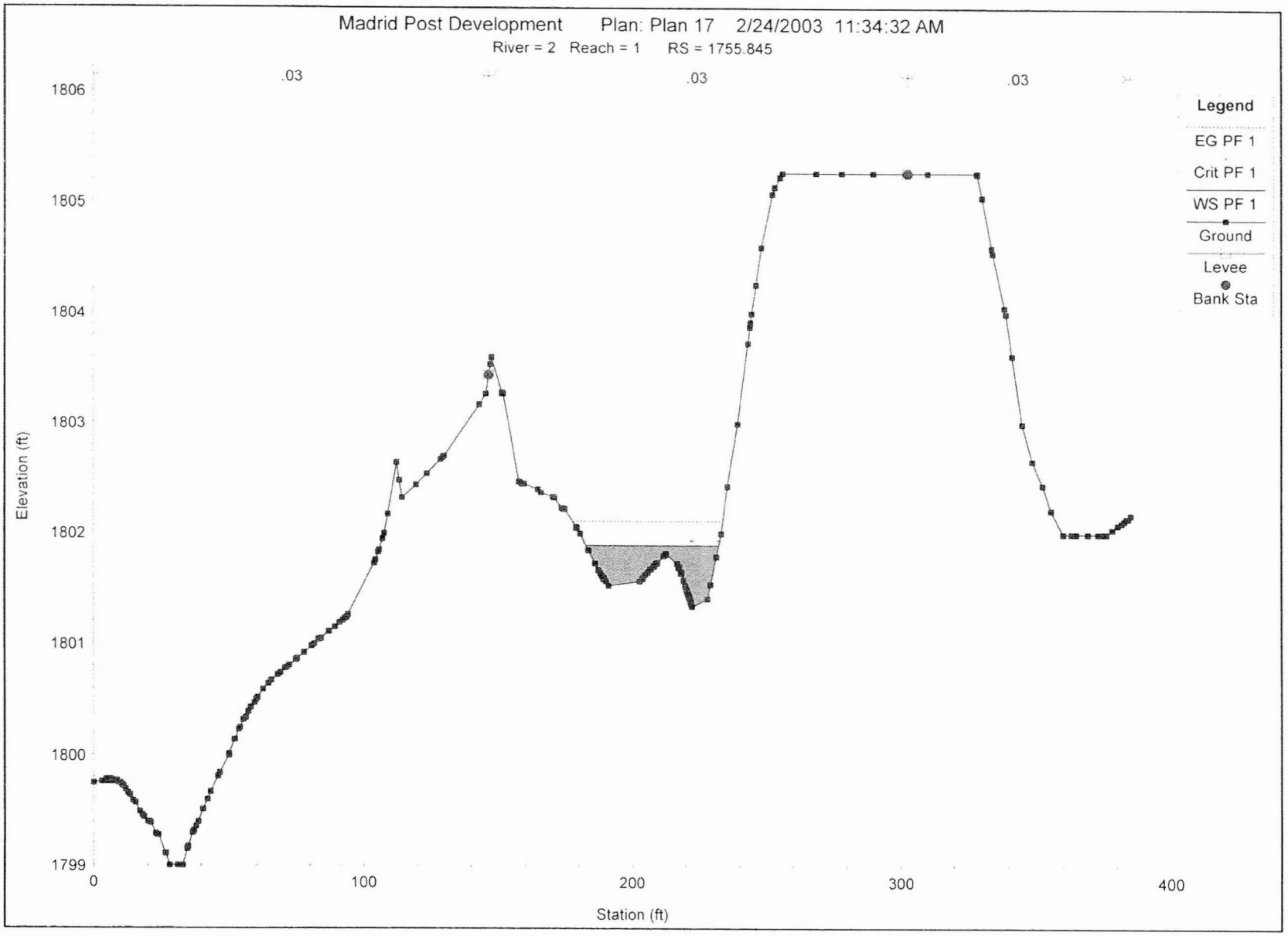

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1901.470
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
1805.8
1805.6
1805.4
1805.2
1805.0
Elevation (ft)
0
50
100
150
200
250
Station (ft)

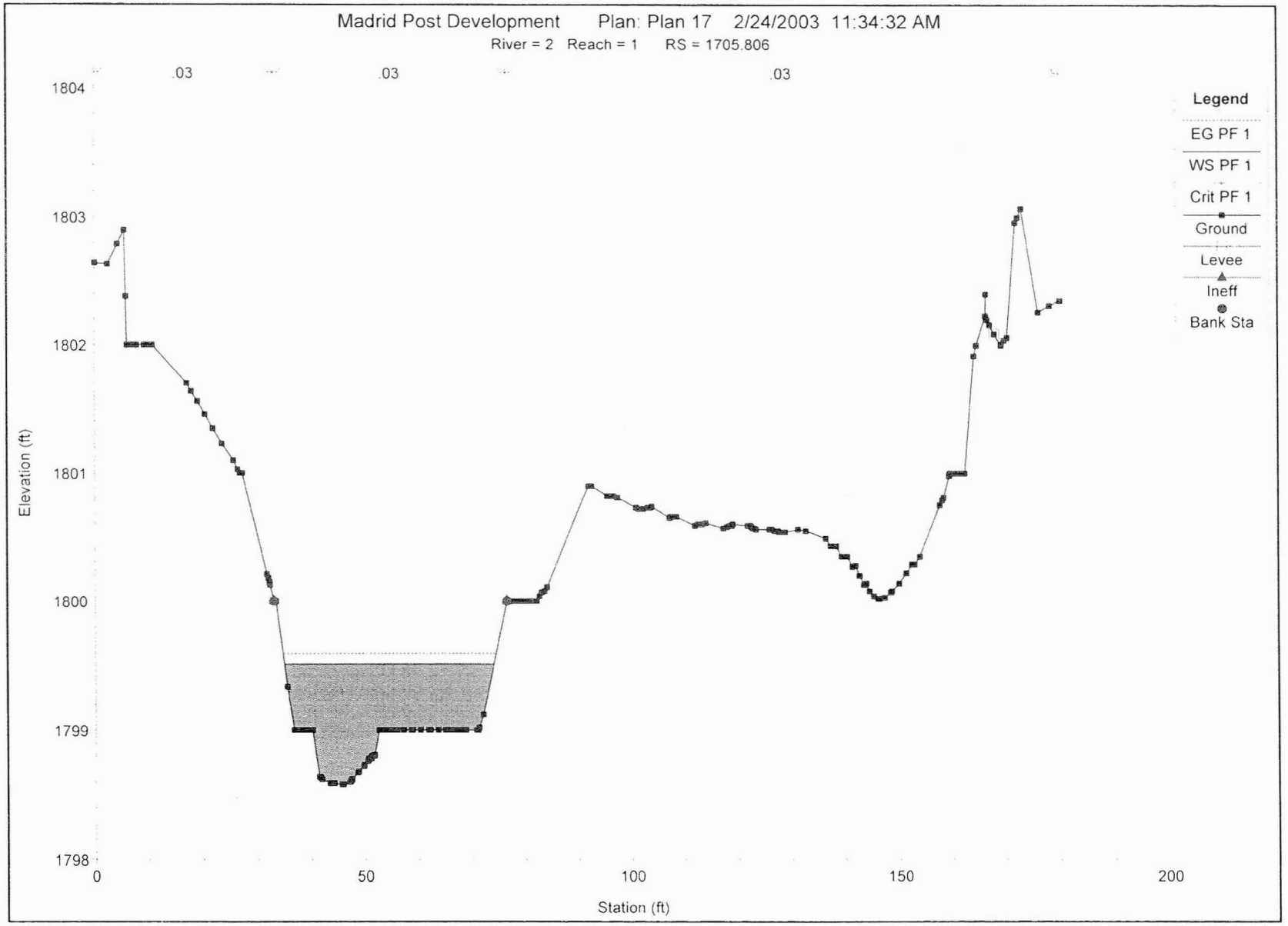

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1895.003
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
1805.6
1805.4
1805.2
1805.0
1804.8
Elevation (ft)
0
50
100
150
200
Station (ft)

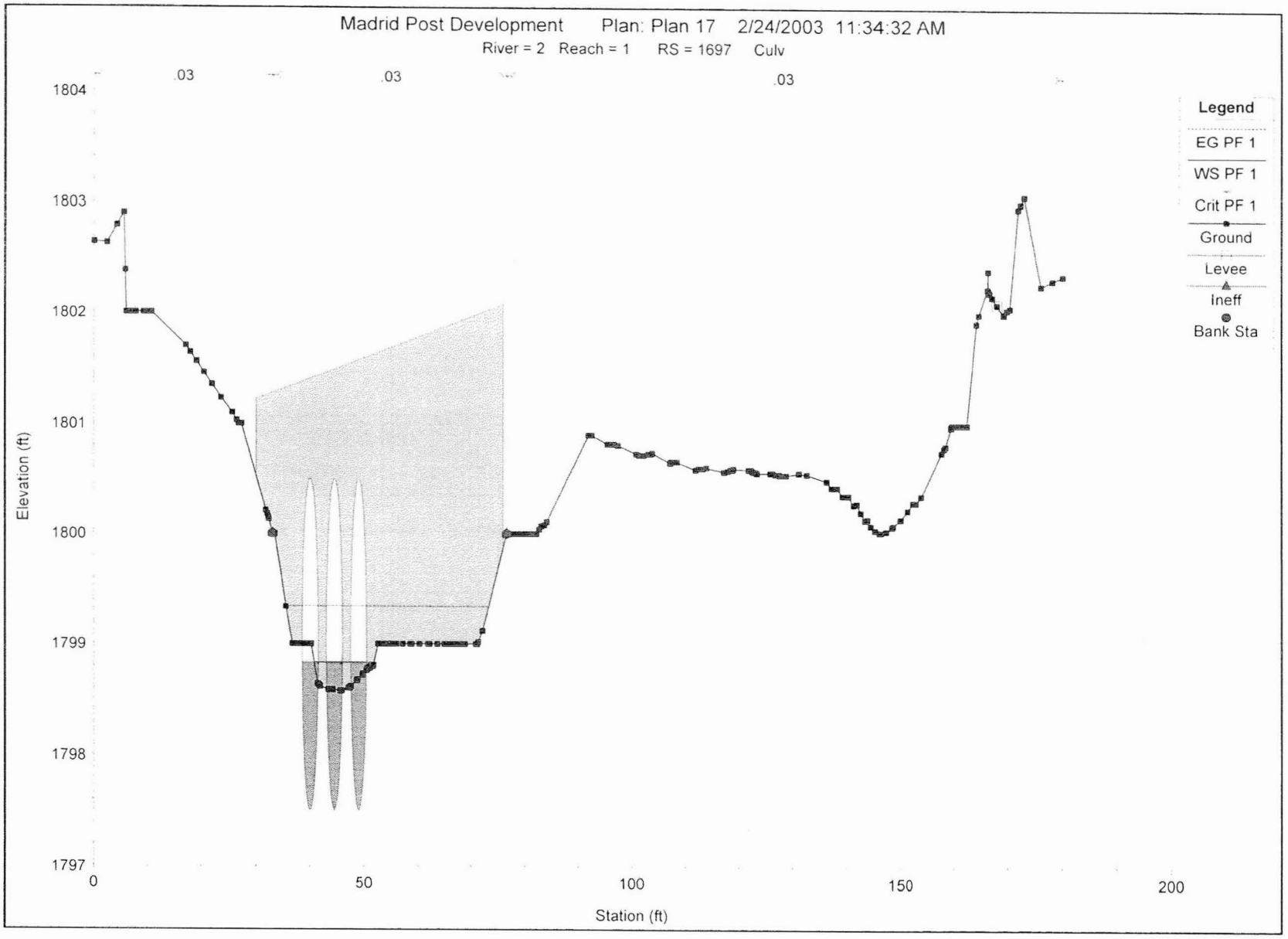

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1857.578
.015
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1804.8
1804.6
1804.4
1804.2
1804.0
1803.8
1803.6
0
20
40
60
80
100
120
140
160
180
Station (ft)

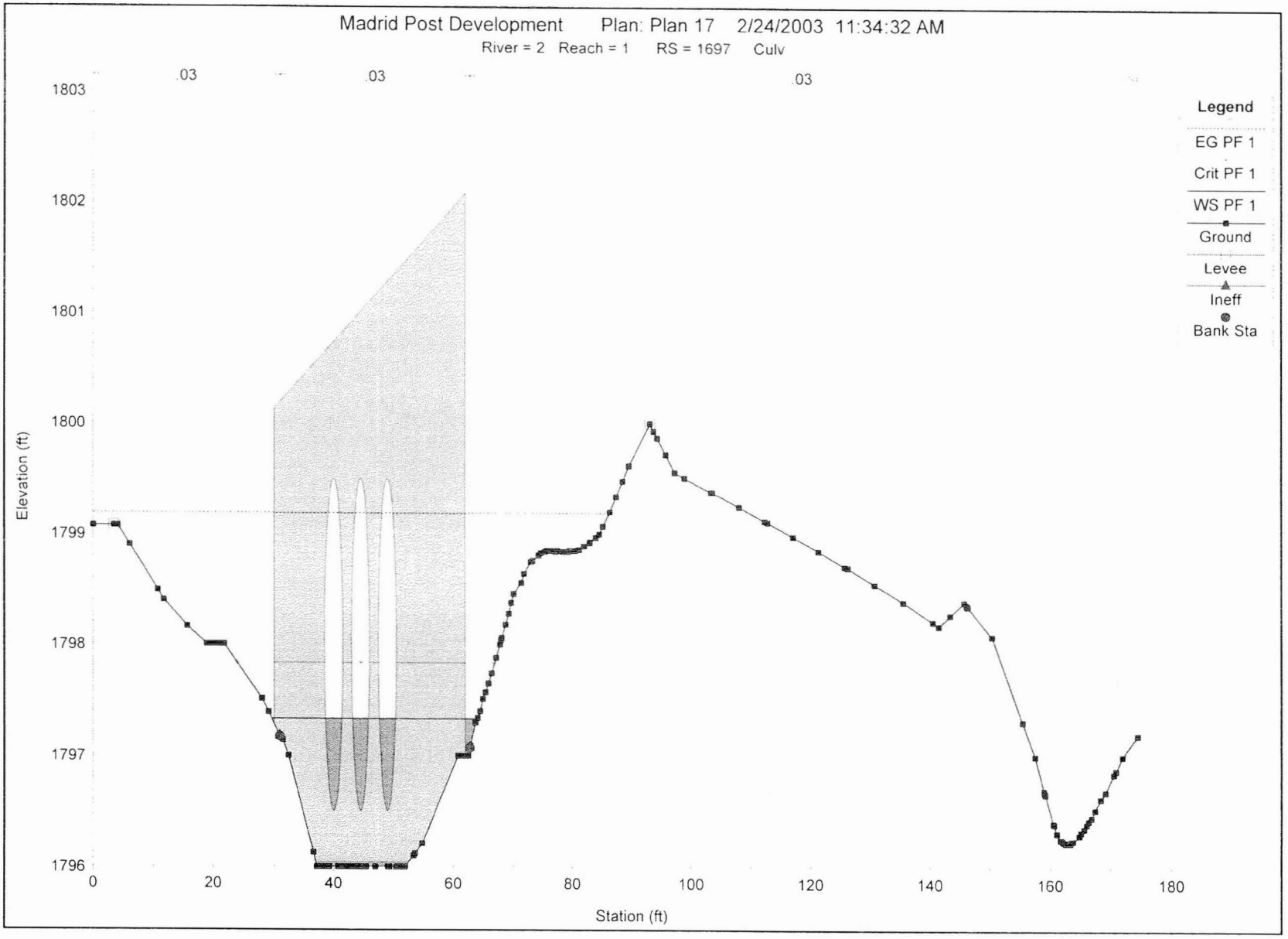

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1841.608
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1805.5
1805.0
1804.5
1804.0
1803.5
1803.0
0
50
100
150
200
Station (ft)

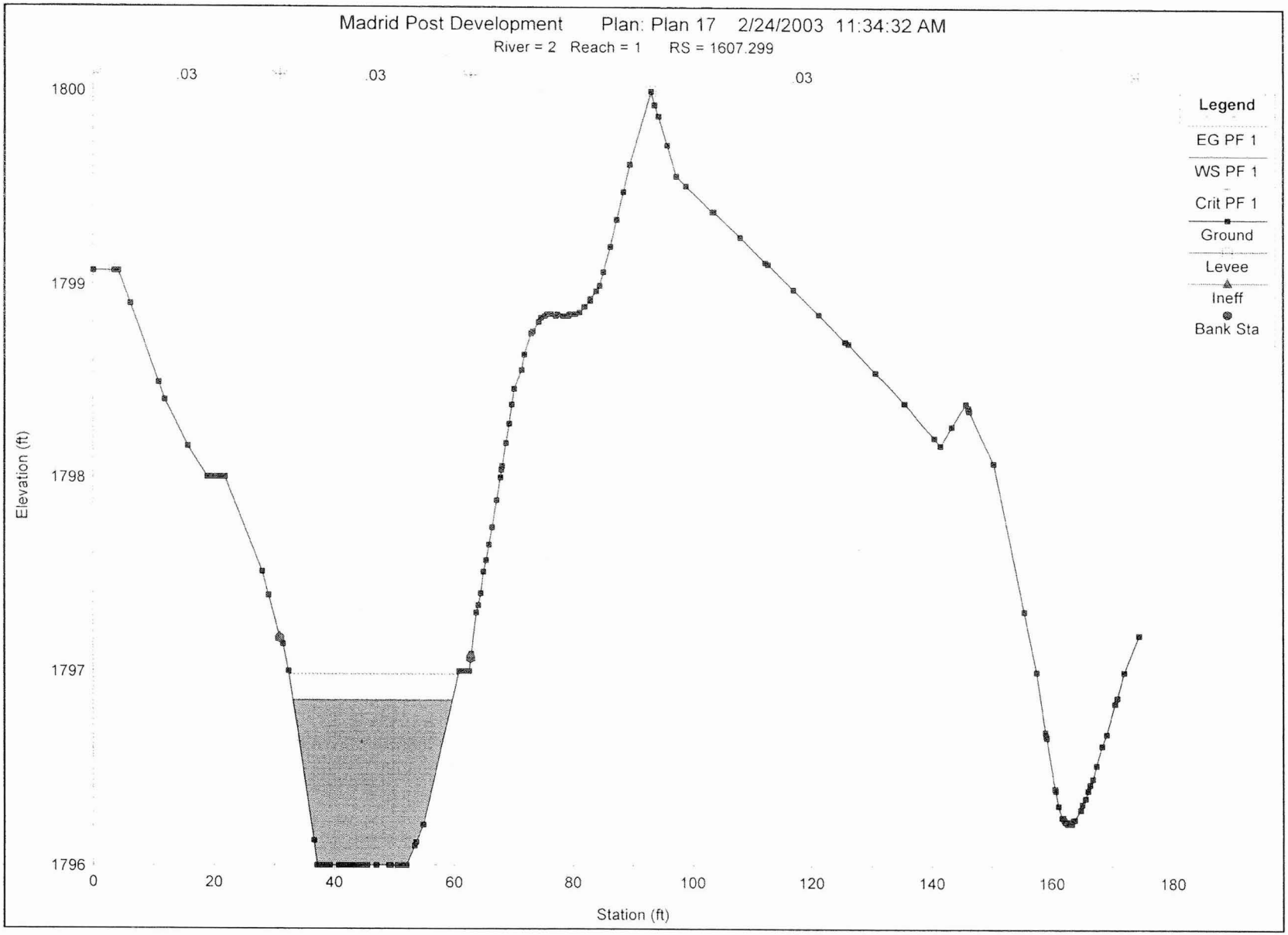

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1809.517
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1805.5
1805.0
1804.5
1804.0
1803.5
1803.0
1802.5
1802.0
1801.5
0
50
100
150
200
250
Station (ft)

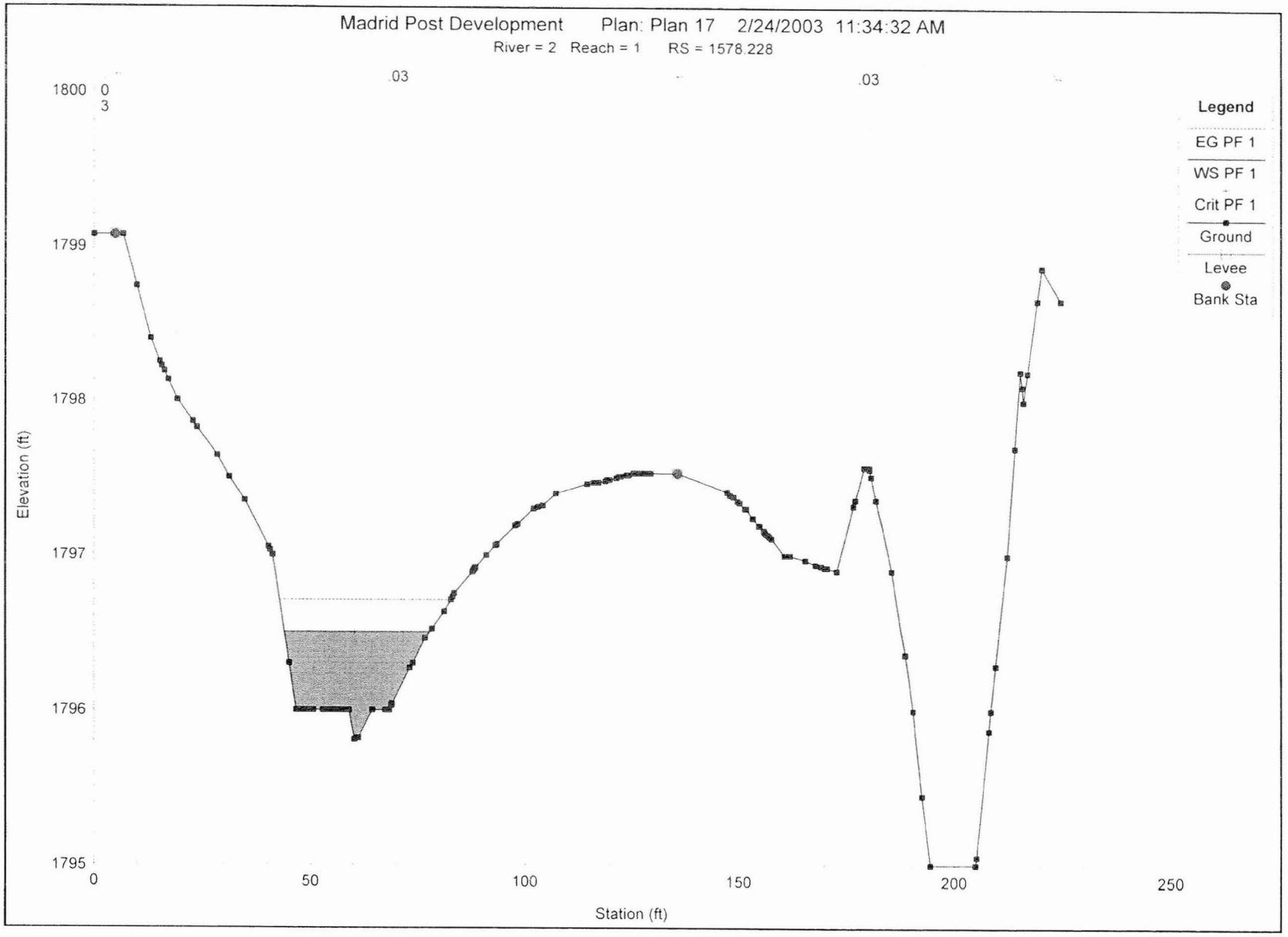

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1755.845
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1806
1805
1804
1803
1802
1801
1800
1799
0
100
200
300
400
Station (ft)

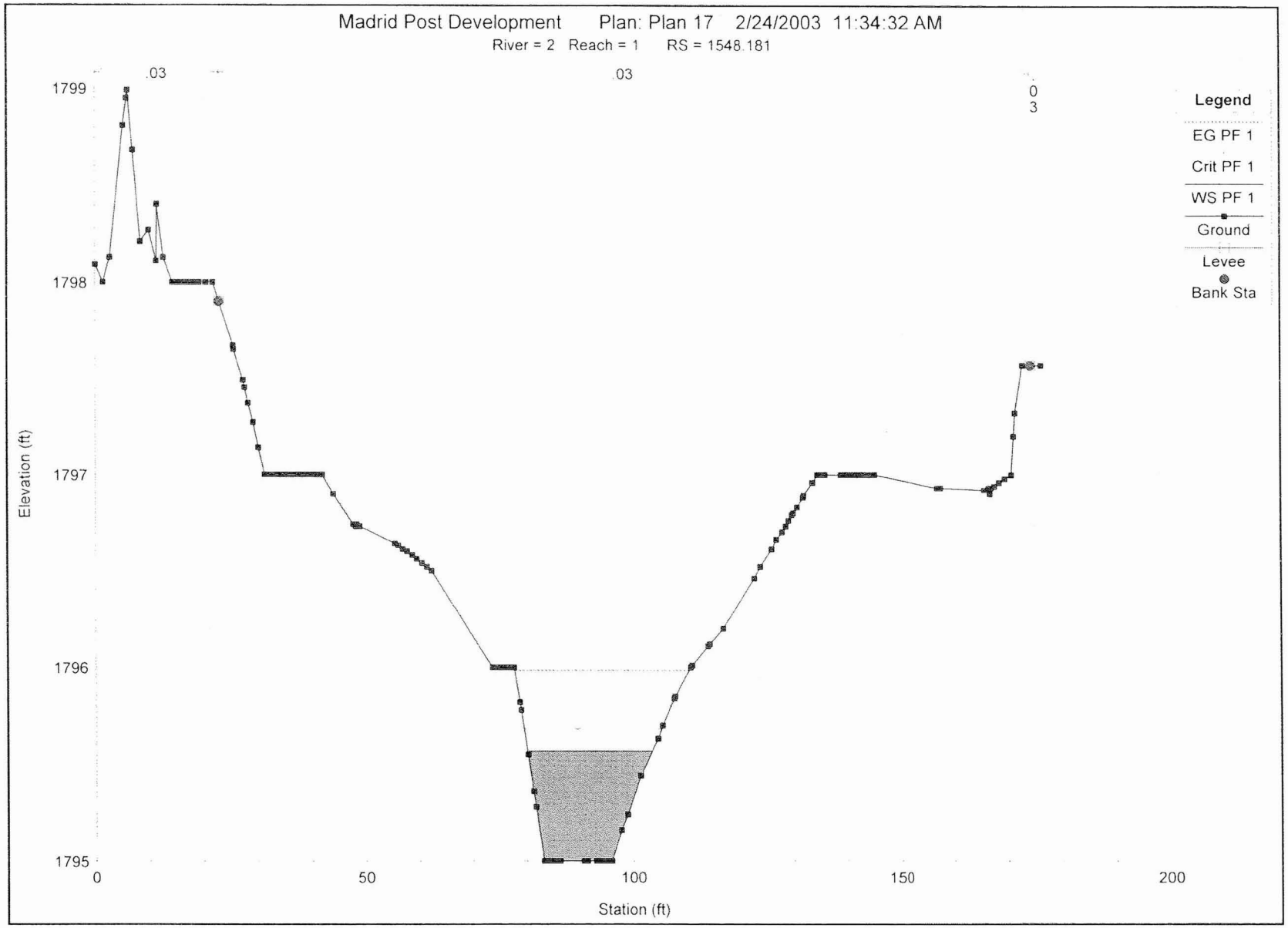

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1705.806
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1804
1803
1802
1801
1800
1799
1798
0
50
100
150
200
Station (ft)

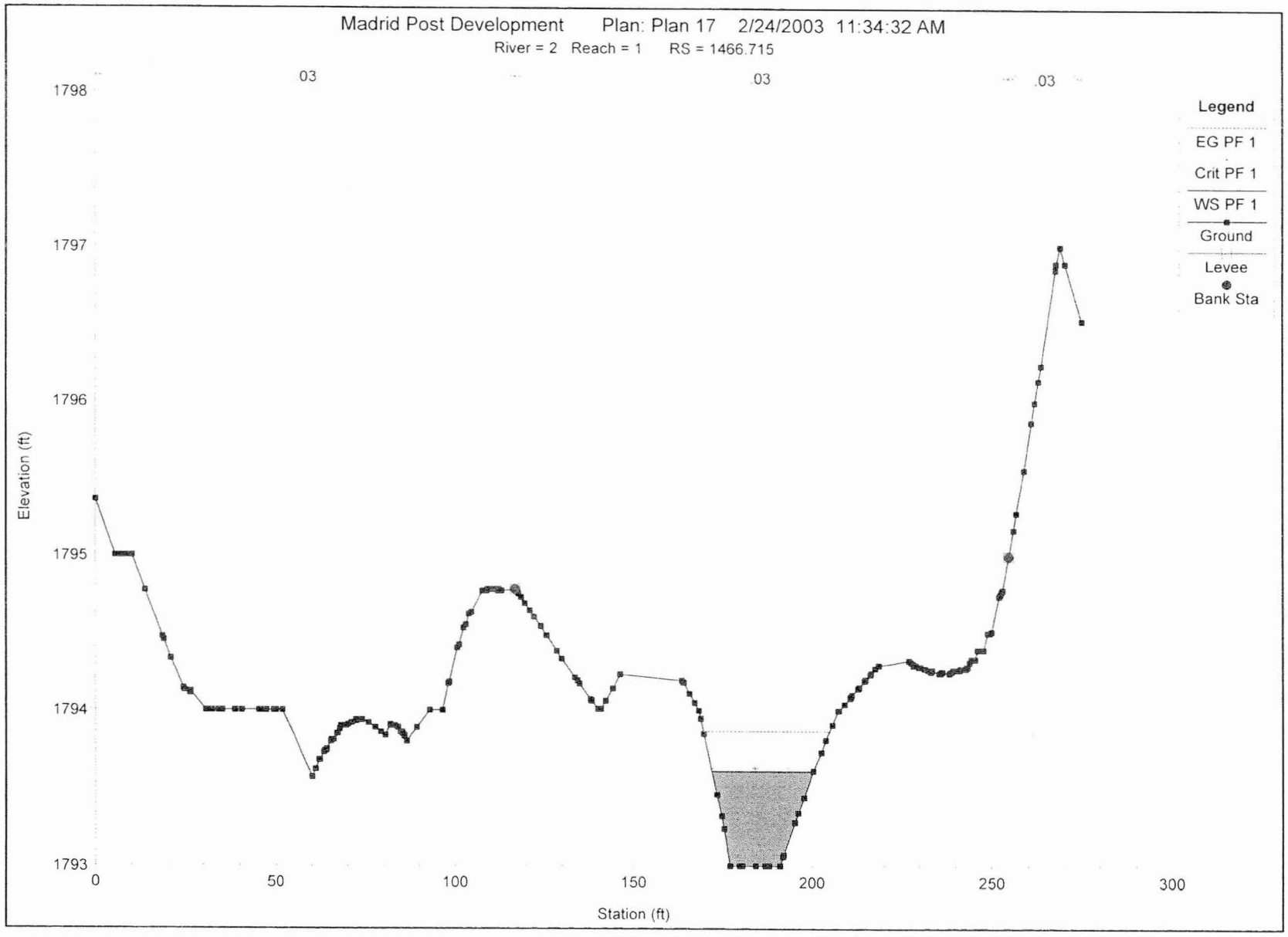

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1697 Culv
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1804
1803
1802
1801
1800
1799
1798
1797
0
50
100
150
200
Station (ft)

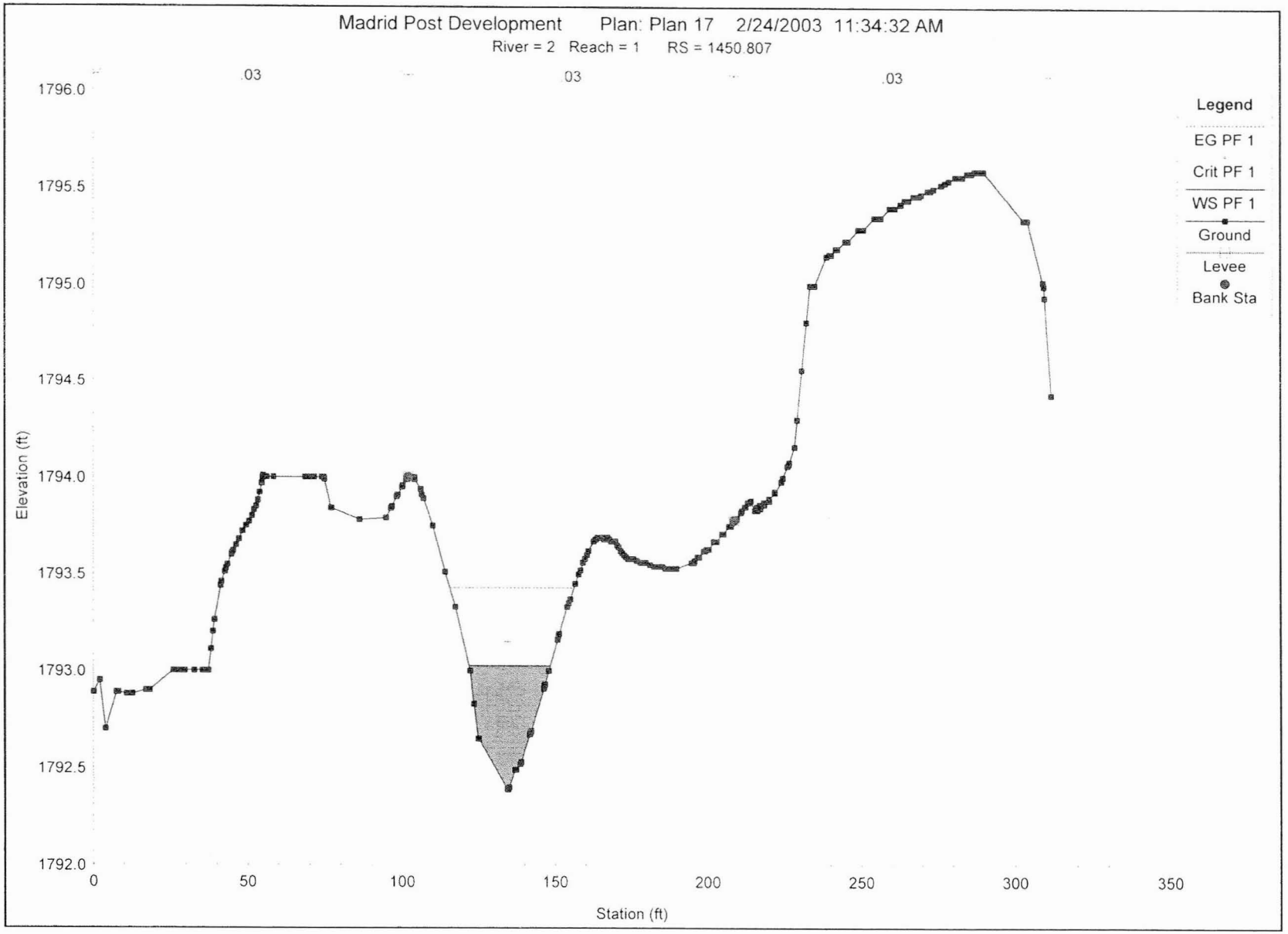

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1697 Culv
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1803
1802
1801
1800
1799
1798
1797
1796
0
20
40
60
80
100
120
140
160
180
Station (ft)

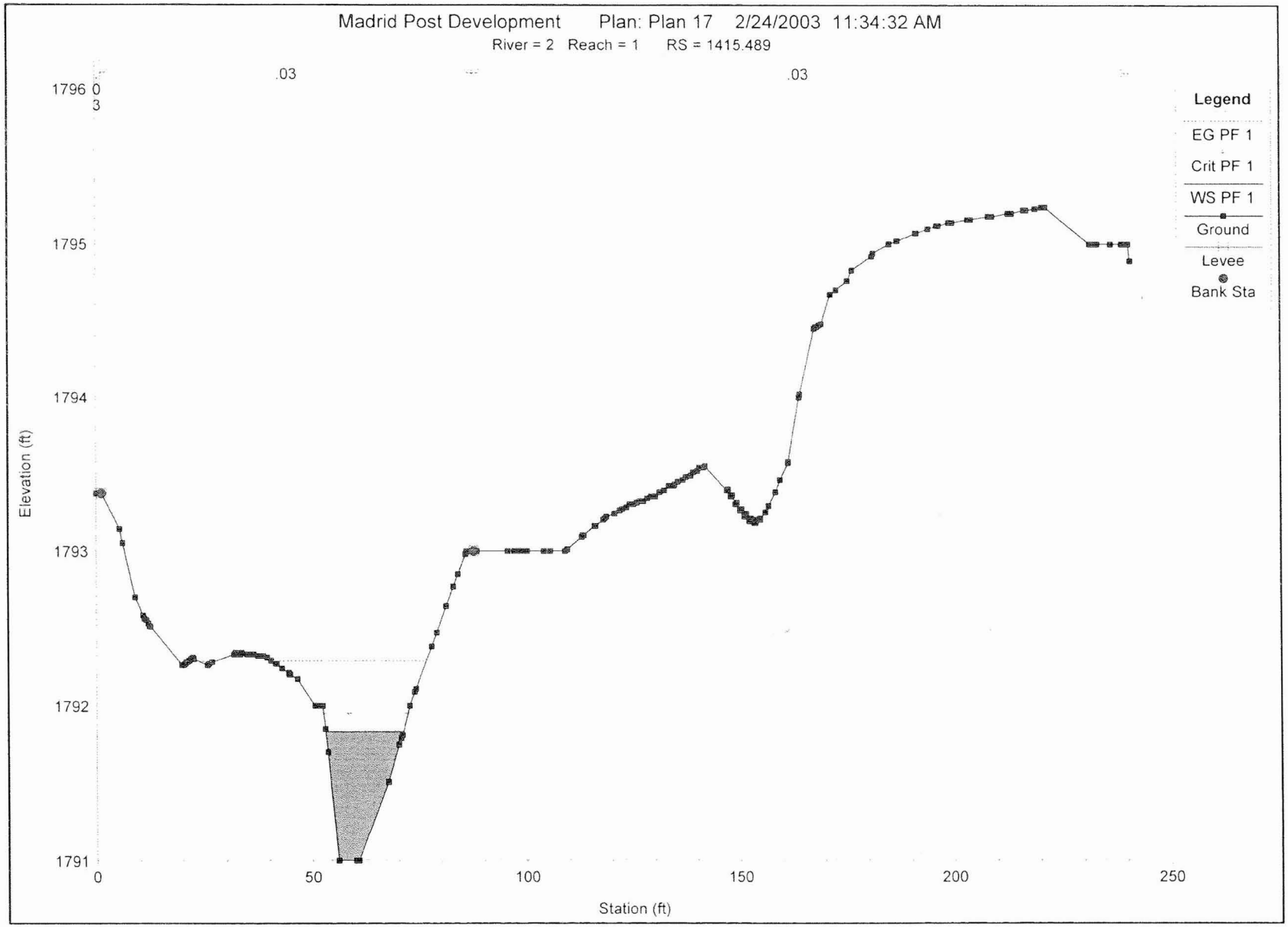

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1607.299
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1800
1799
1798
1797
1796
0
20
40
60
80
100
120
140
160
180
Station (ft)

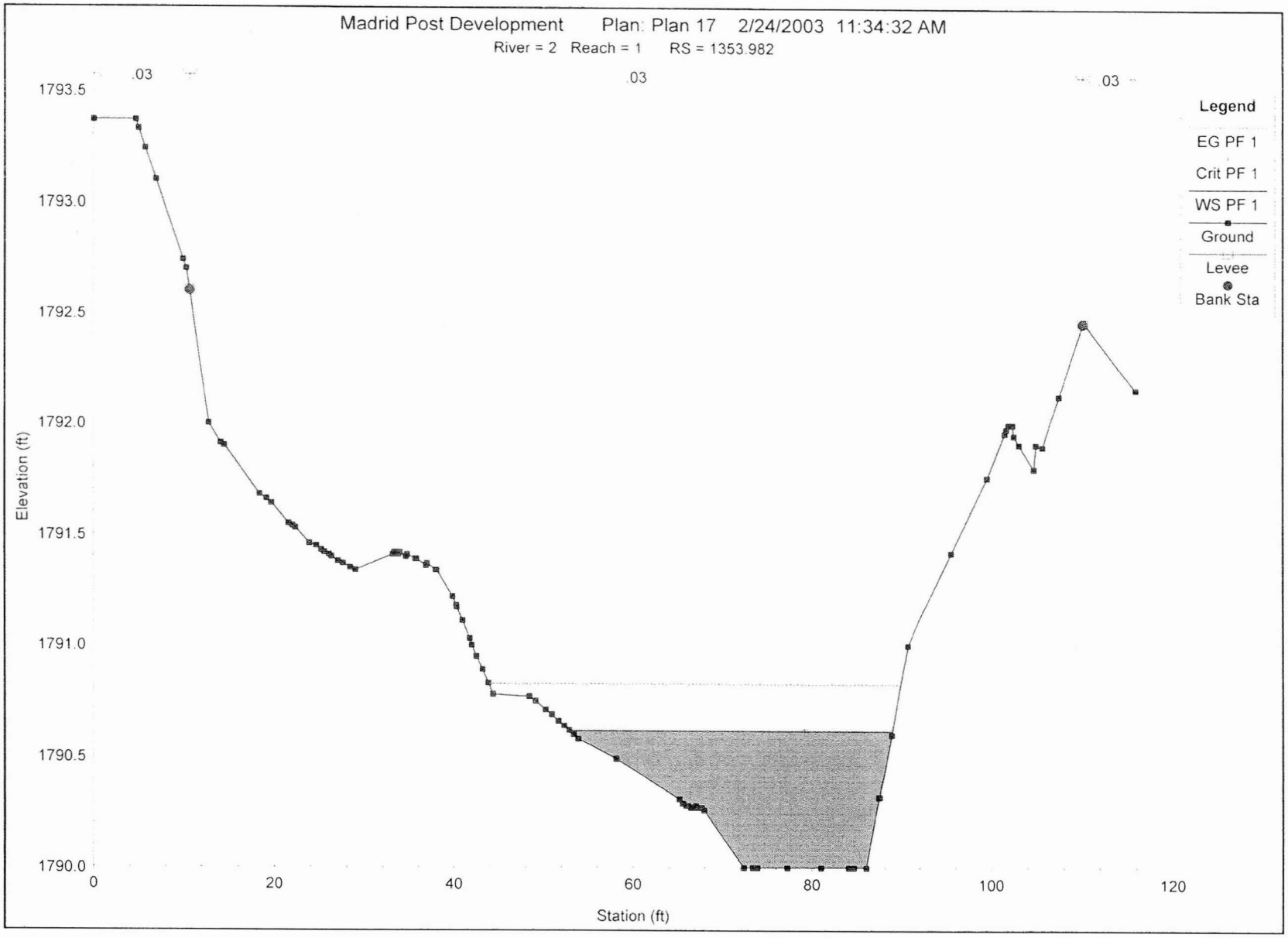

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1578.228
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1800
1799
1798
1797
1796
1795
0
50
100
150
200
250
Station (ft)

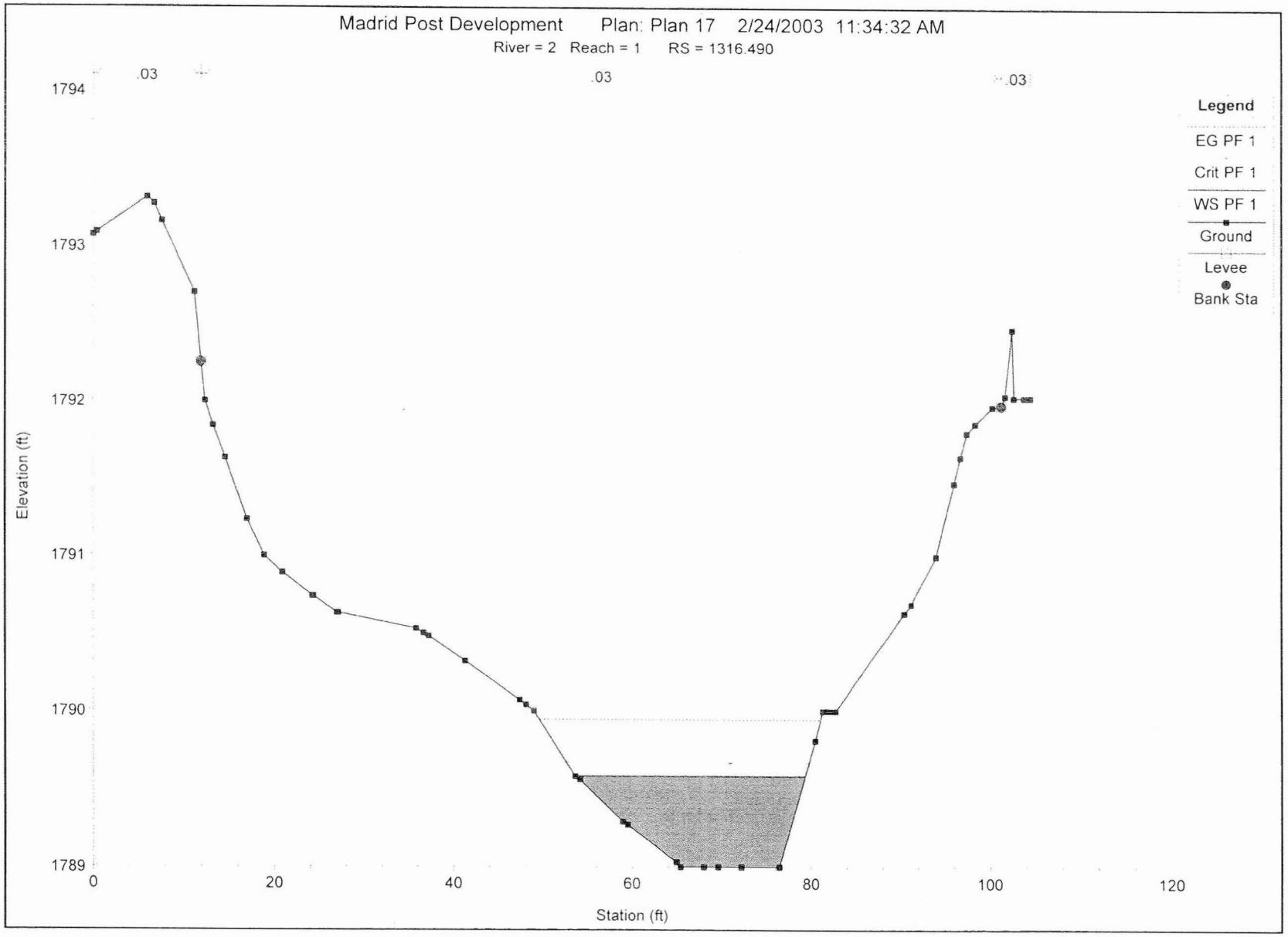

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1548.181
.03
.03
0
3
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1799
1798
1797
1796
1795
0
50
100
150
200
Station (ft)

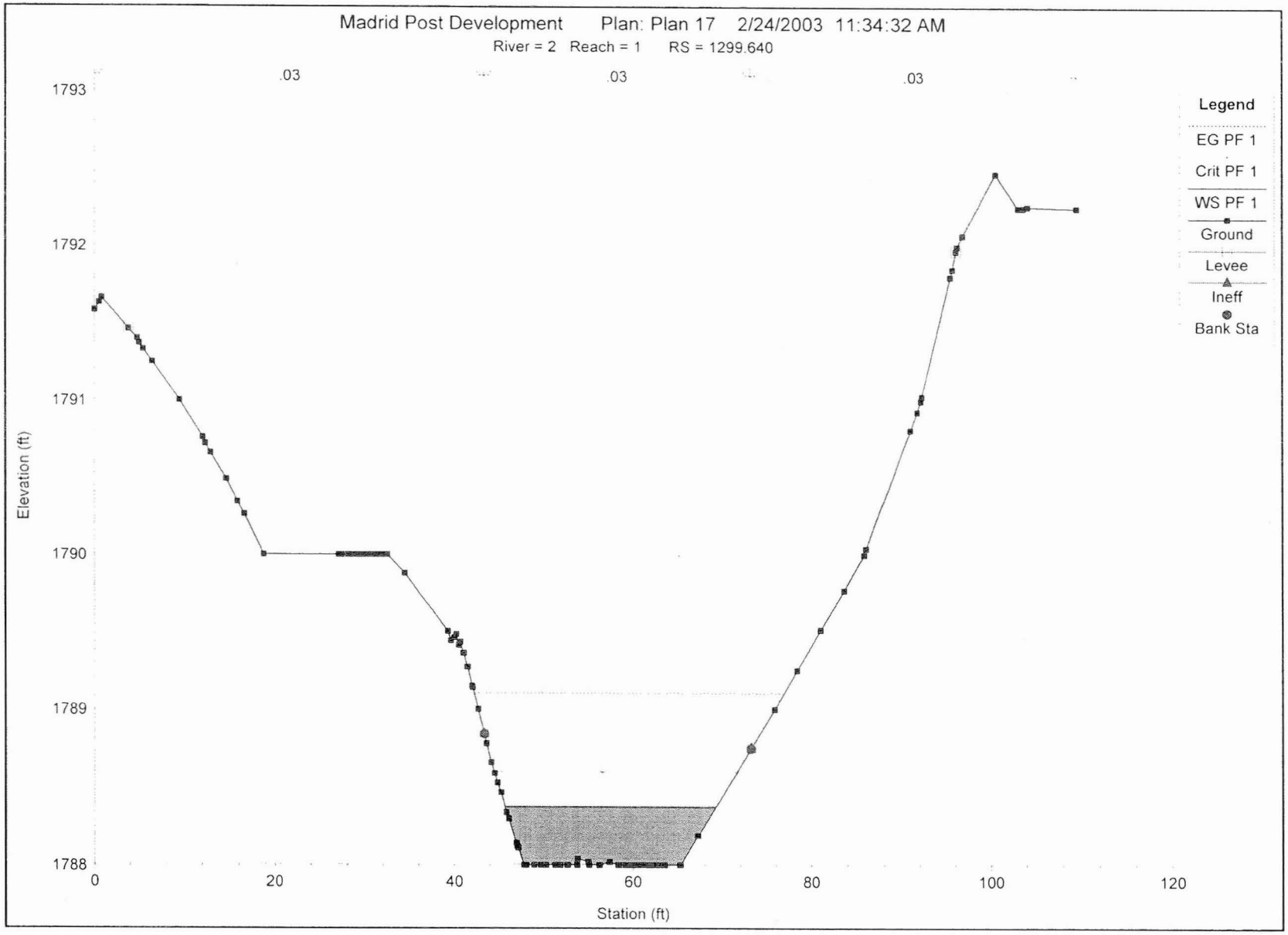

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1466.715
03
03
03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1798
1797
1796
1795
1794
1793
0
50
100
150
200
250
300
Station (ft)

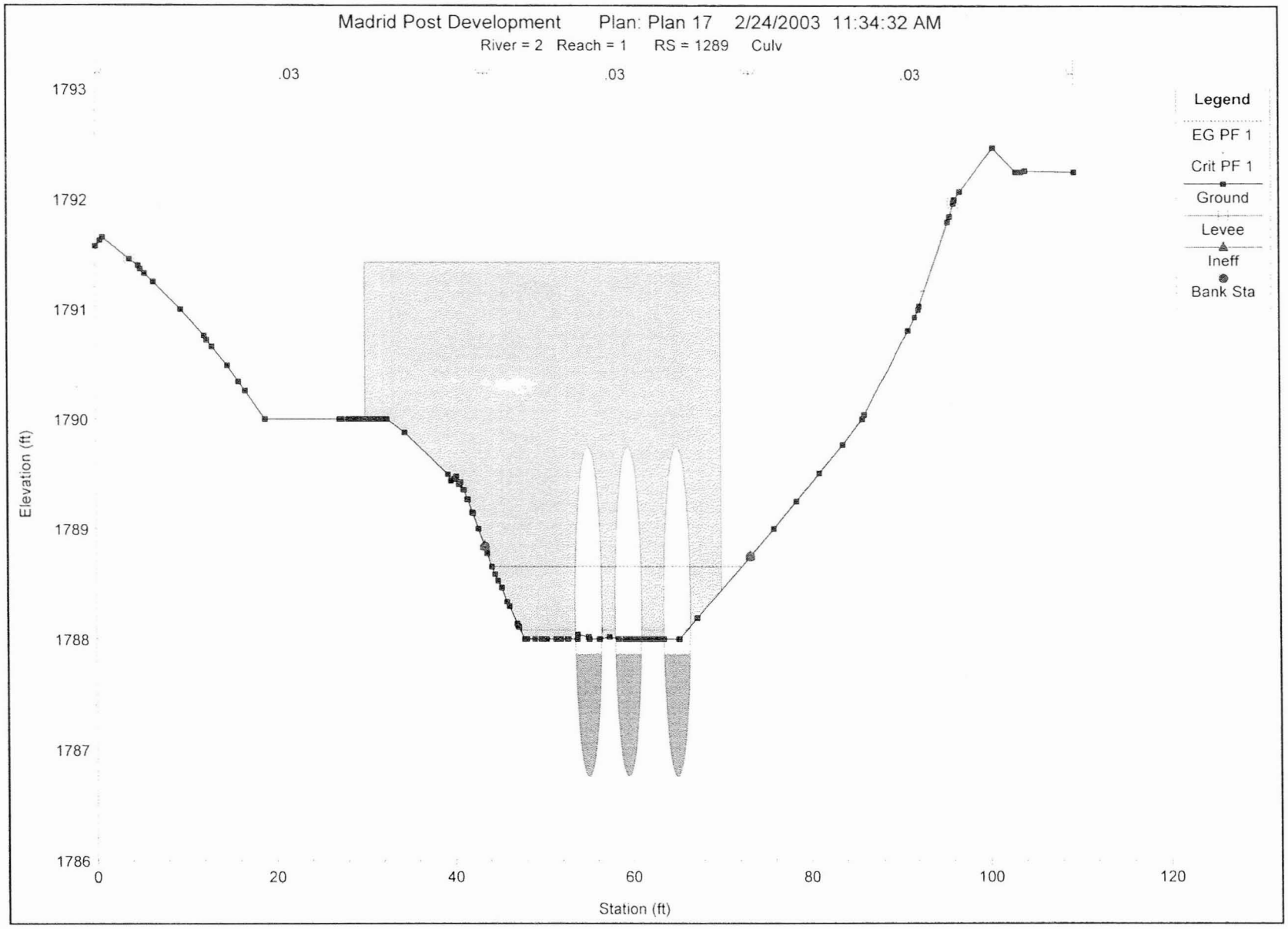

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1450.807
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1796.0
1795.5
1795.0
1794.5
1794.0
1793.5
1793.0
1792.5
1792.0
0
50
100
150
200
250
300
350
Station (ft)

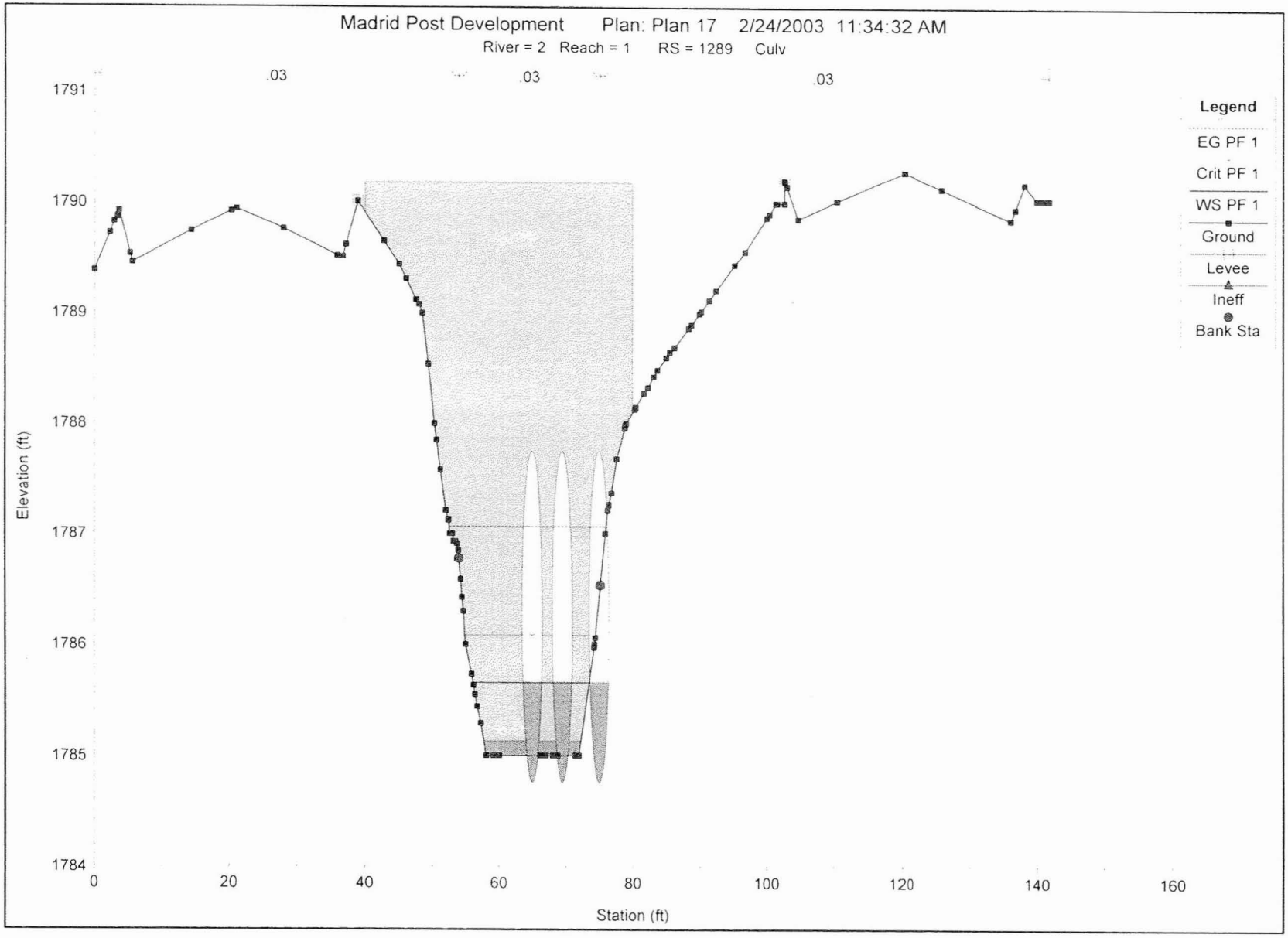

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1415.489
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1796
1795
1794
1793
1792
1791
0
50
100
150
200
250
Station (ft)

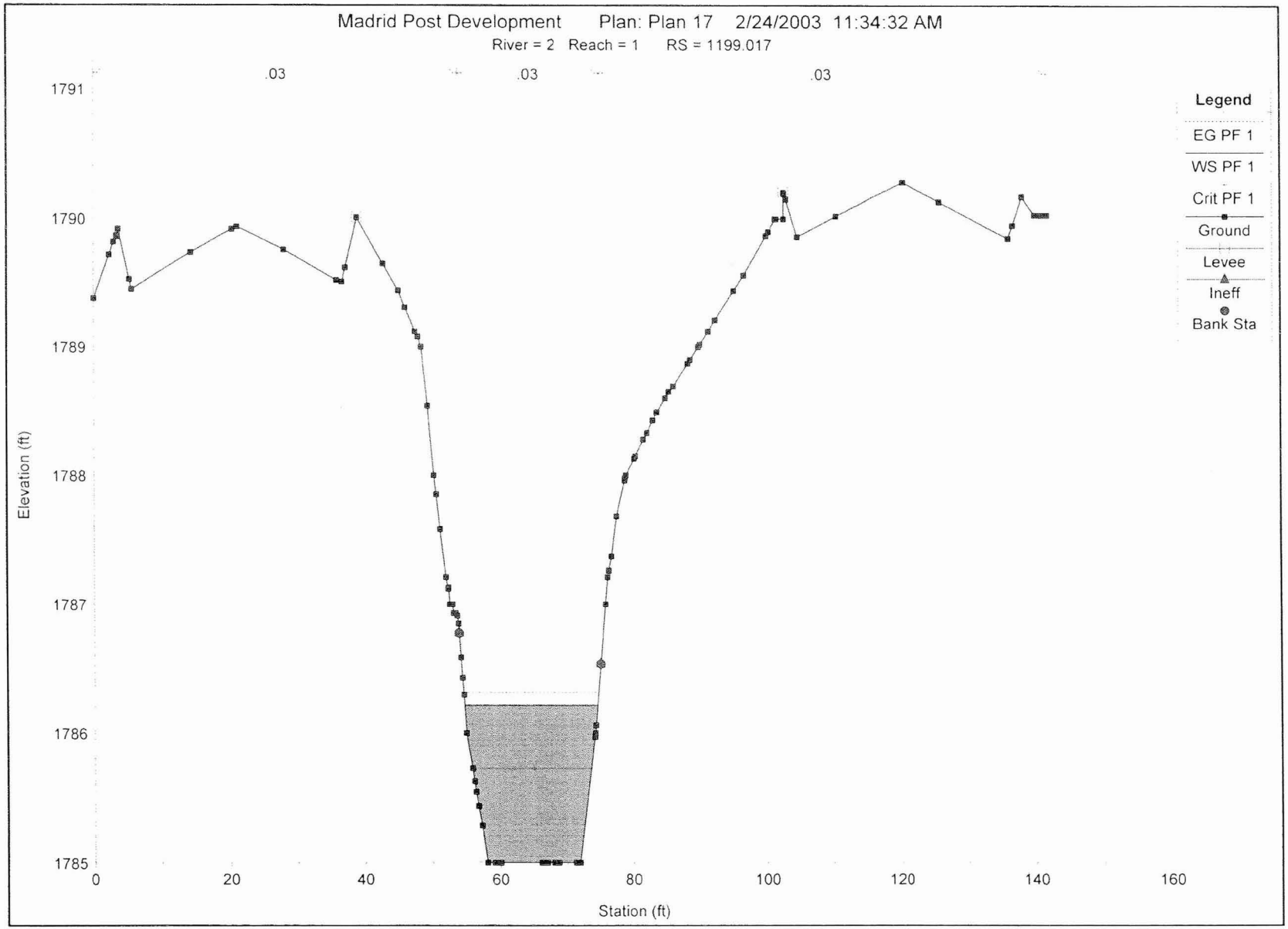

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1353.982
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1793.5
1793.0
1792.5
1792.0
1791.5
1791.0
1790.5
1790.0
0
20
40
60
80
100
120
Station (ft)

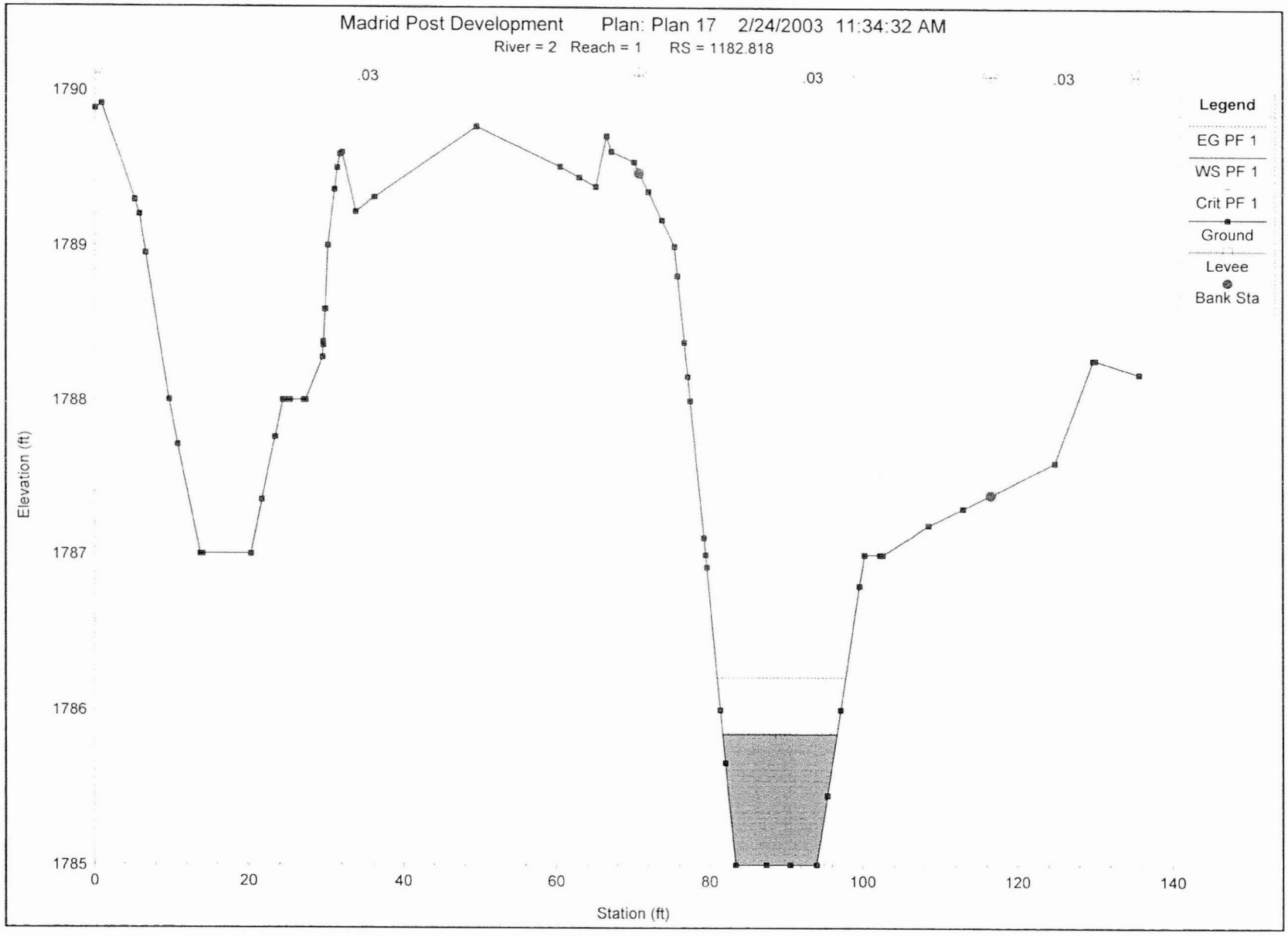

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1316.490
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1794
1793
1792
1791
1790
1789
0
20
40
60
80
100
120
Station (ft)

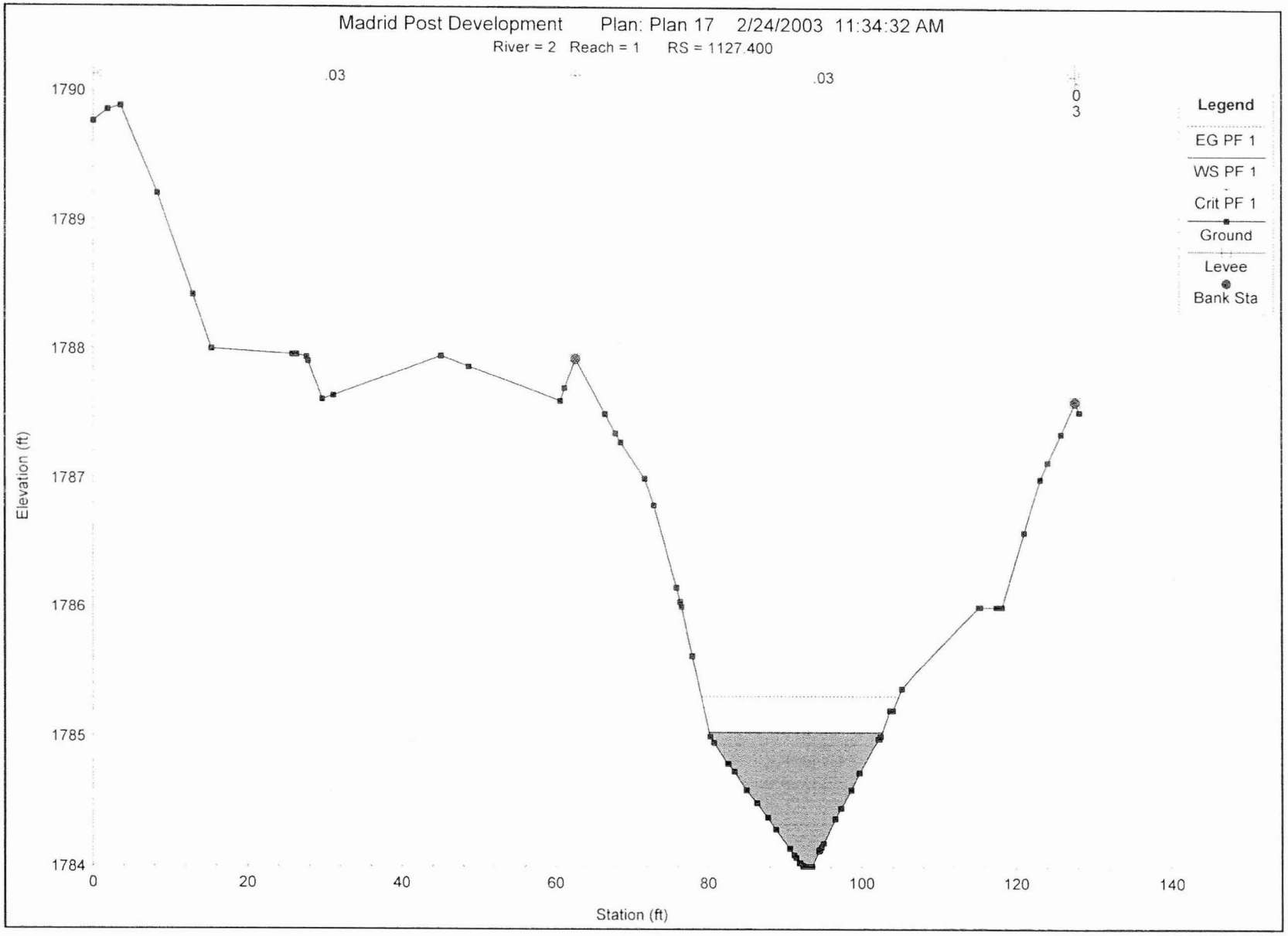

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1299.640
.03
.03
.03
1793
1792
1791
1790
1789
1788
Elevation (ft)
0
20
40
60
80
100
120
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Ineff
Bank Sta

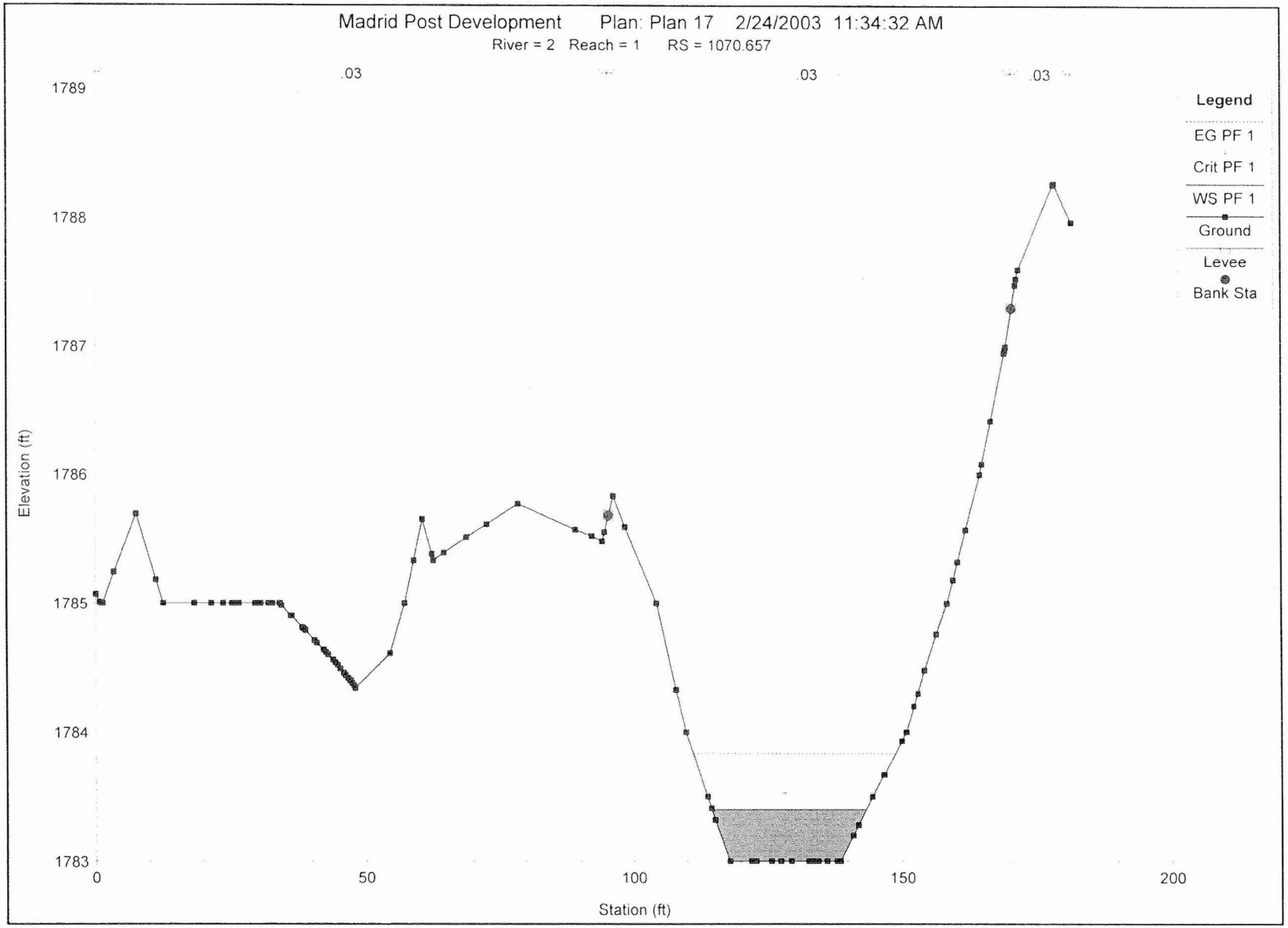

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1289 Culv
.03
.03
.03
1793
1792
1791
1790
1789
1788
1787
1786
Elevation (ft)
0
20
40
60
80
100
120
Station (ft)
Legend
EG PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta

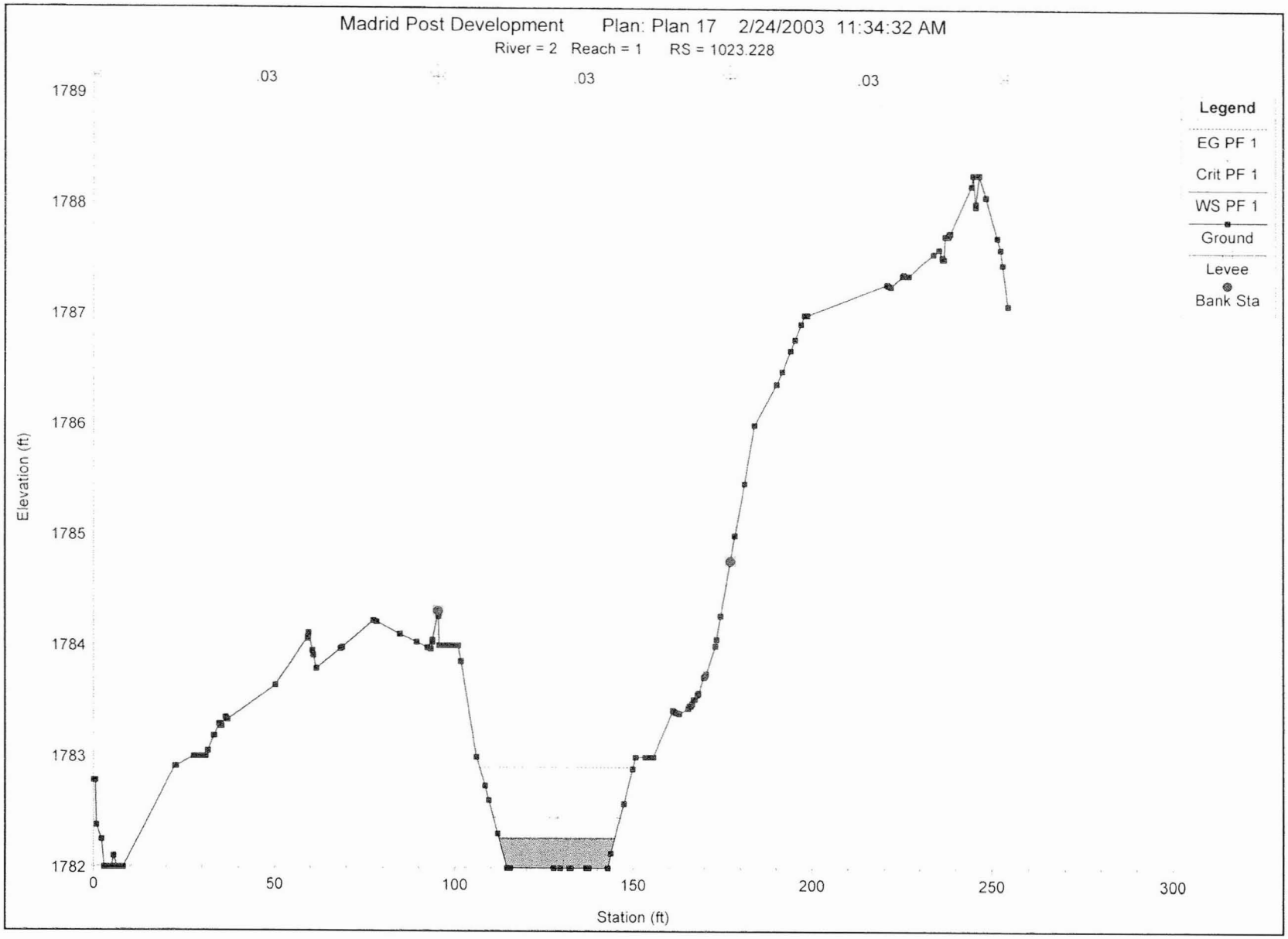

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1289 Culv
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1791
1790
1789
1788
1787
1786
1785
1784
0
20
40
60
80
100
120
140
160
Station (ft)

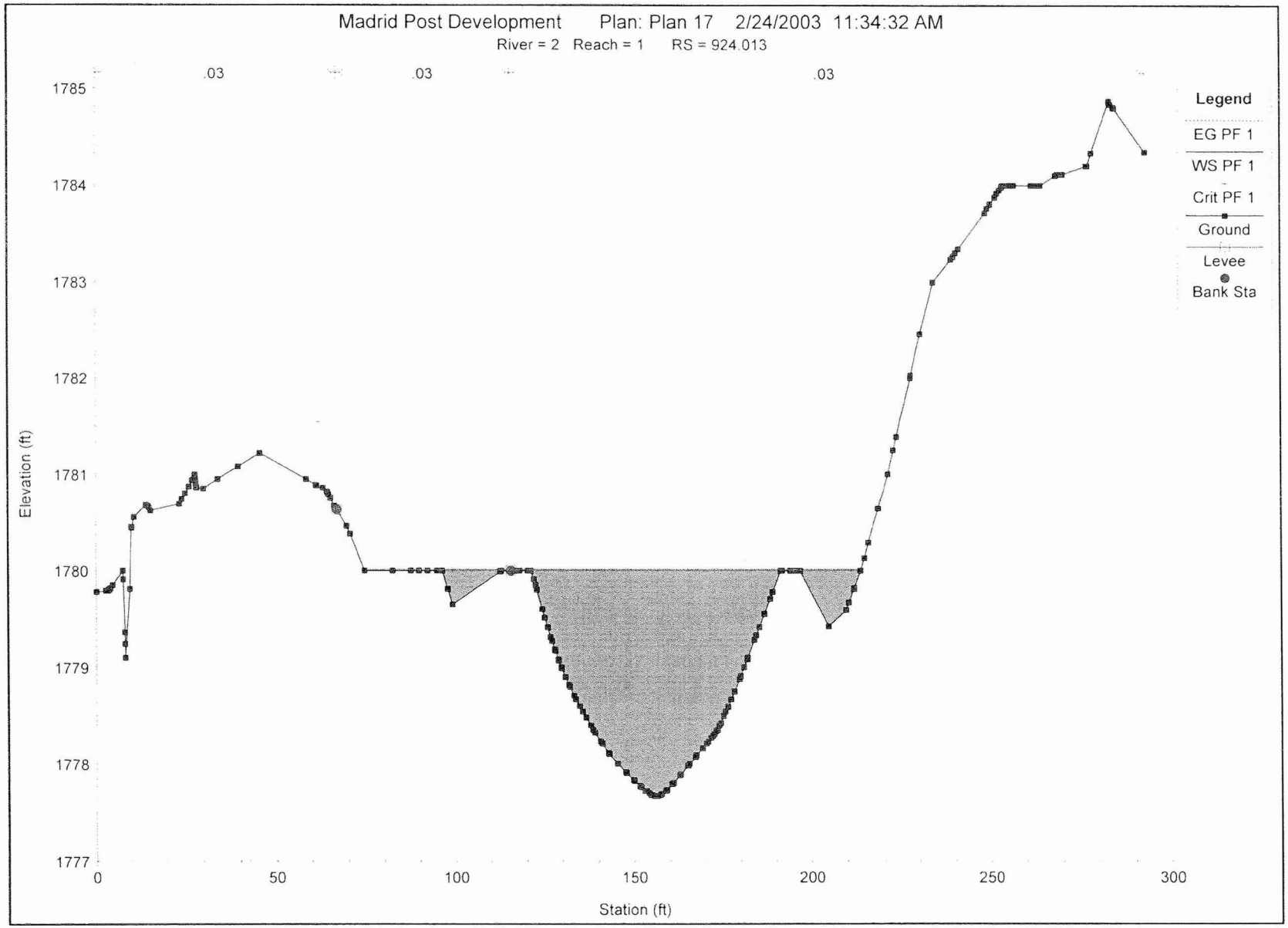

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1199.017
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1791
1790
1789
1788
1787
1786
1785
0
20
40
60
80
100
120
140
160
Station (ft)

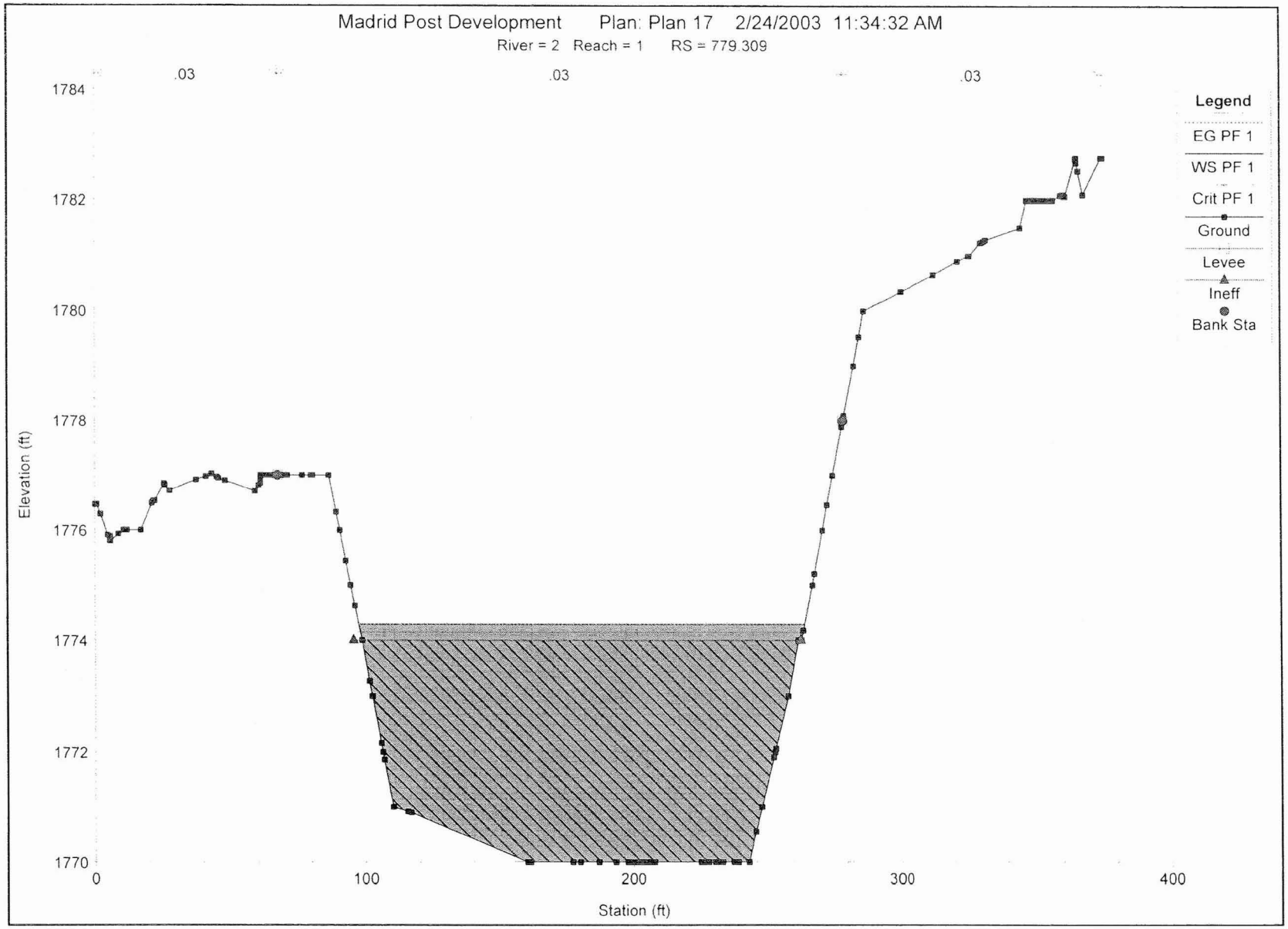

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1182.818
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1790
1789
1788
1787
1786
1785
0
20
40
60
80
100
120
140
Station (ft)

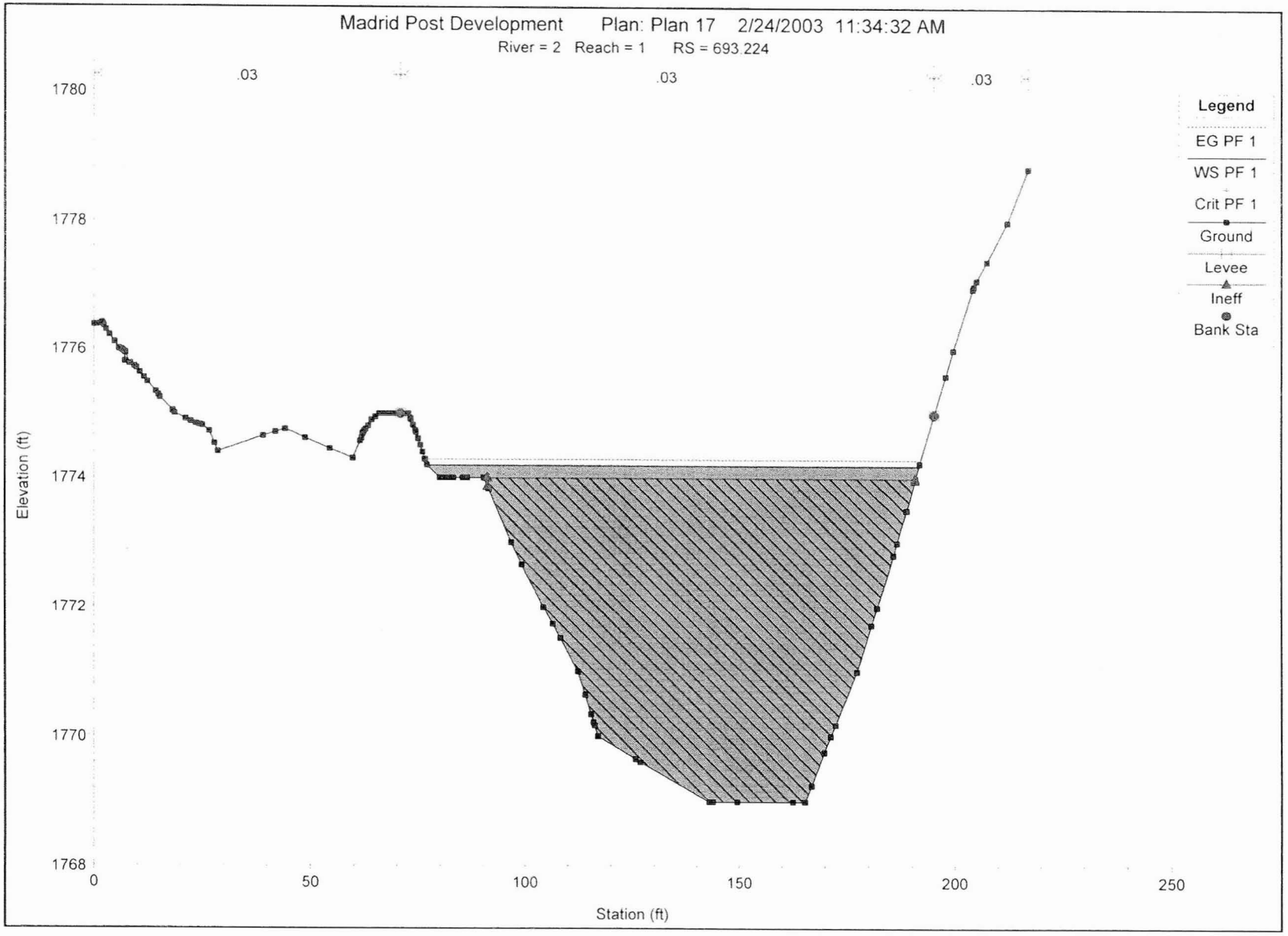

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1127.400
.03
.03
0
3
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1790
1789
1788
1787
1786
1785
1784
0
20
40
60
80
100
120
140
Station (ft)

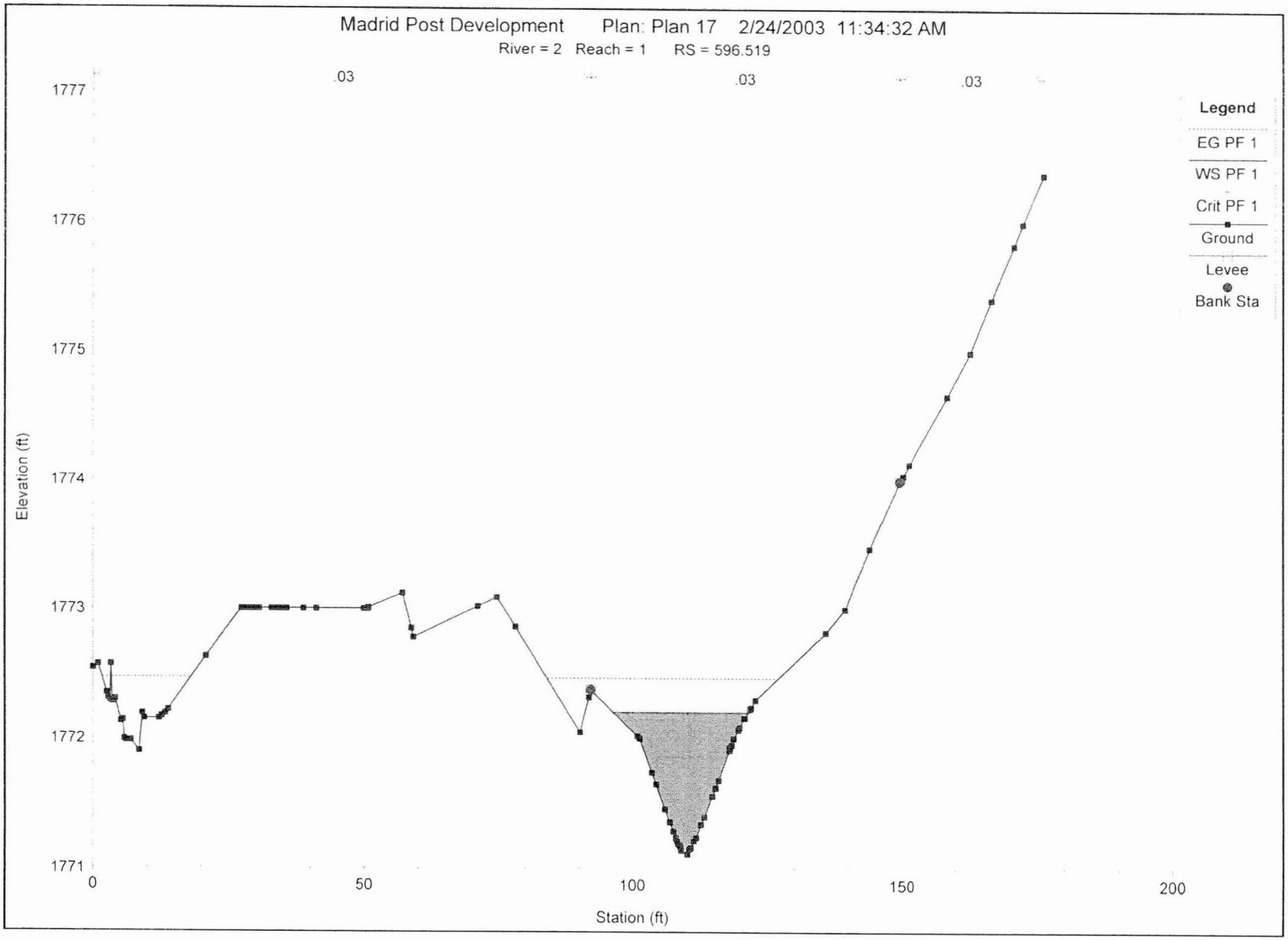

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1070.657
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1789
1788
1787
1786
1785
1784
1783
0
50
100
150
200
Station (ft)

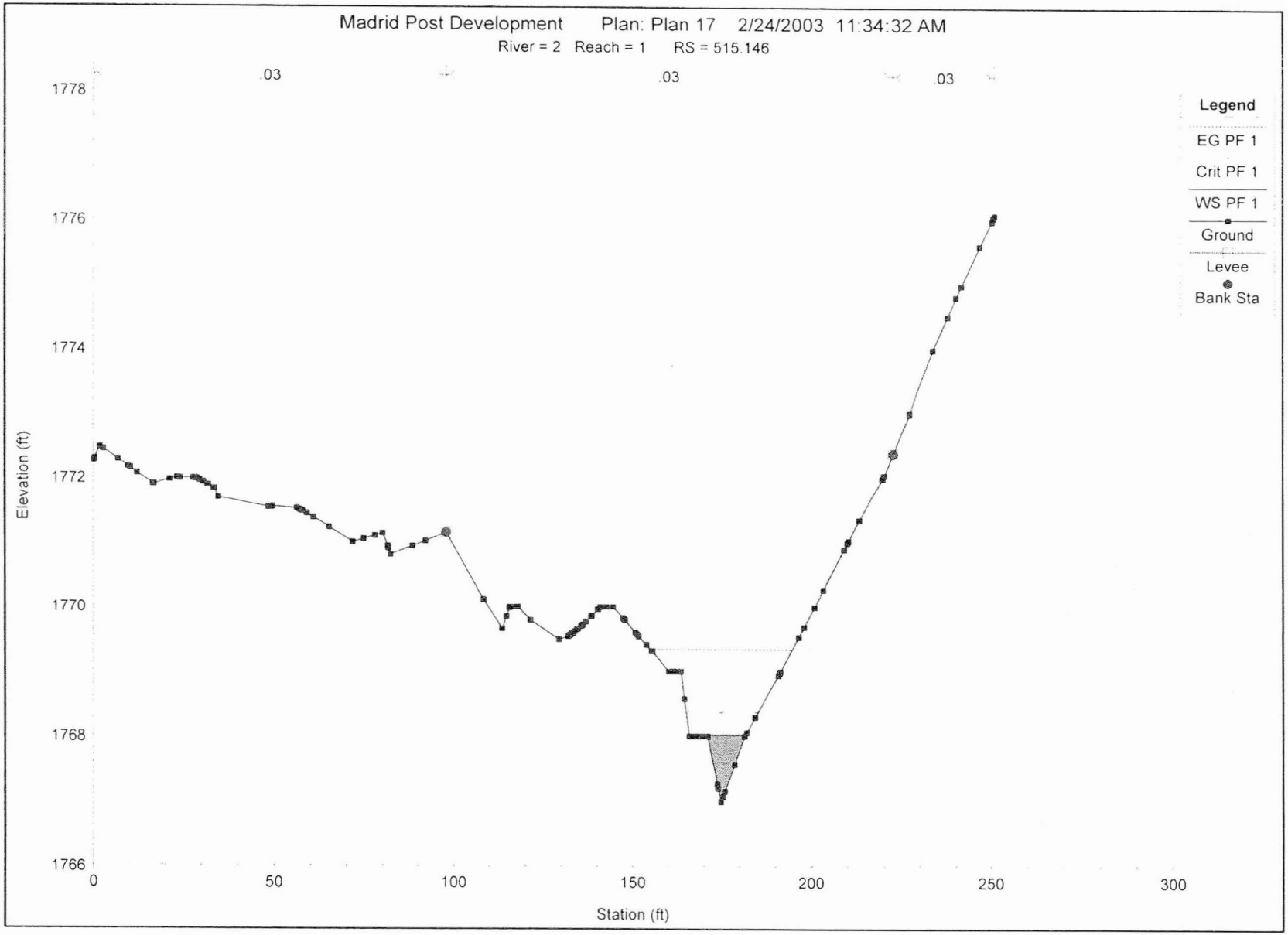

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 1023.228
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1789
1788
1787
1786
1785
1784
1783
1782
0
50
100
150
200
250
300
Station (ft)

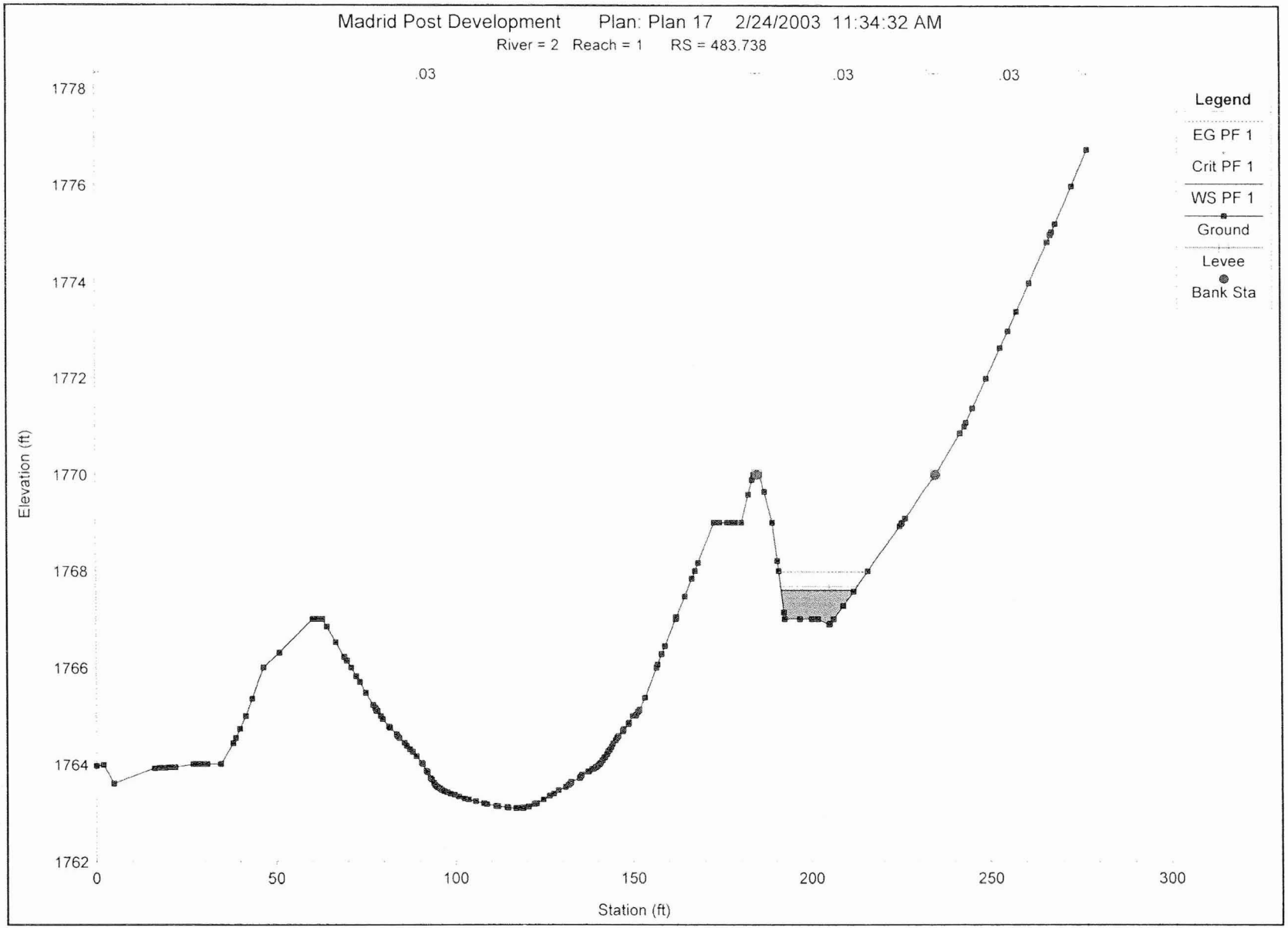

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 924.013
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1785
1784
1783
1782
1781
1780
1779
1778
1777
0
50
100
150
200
250
300
Station (ft)

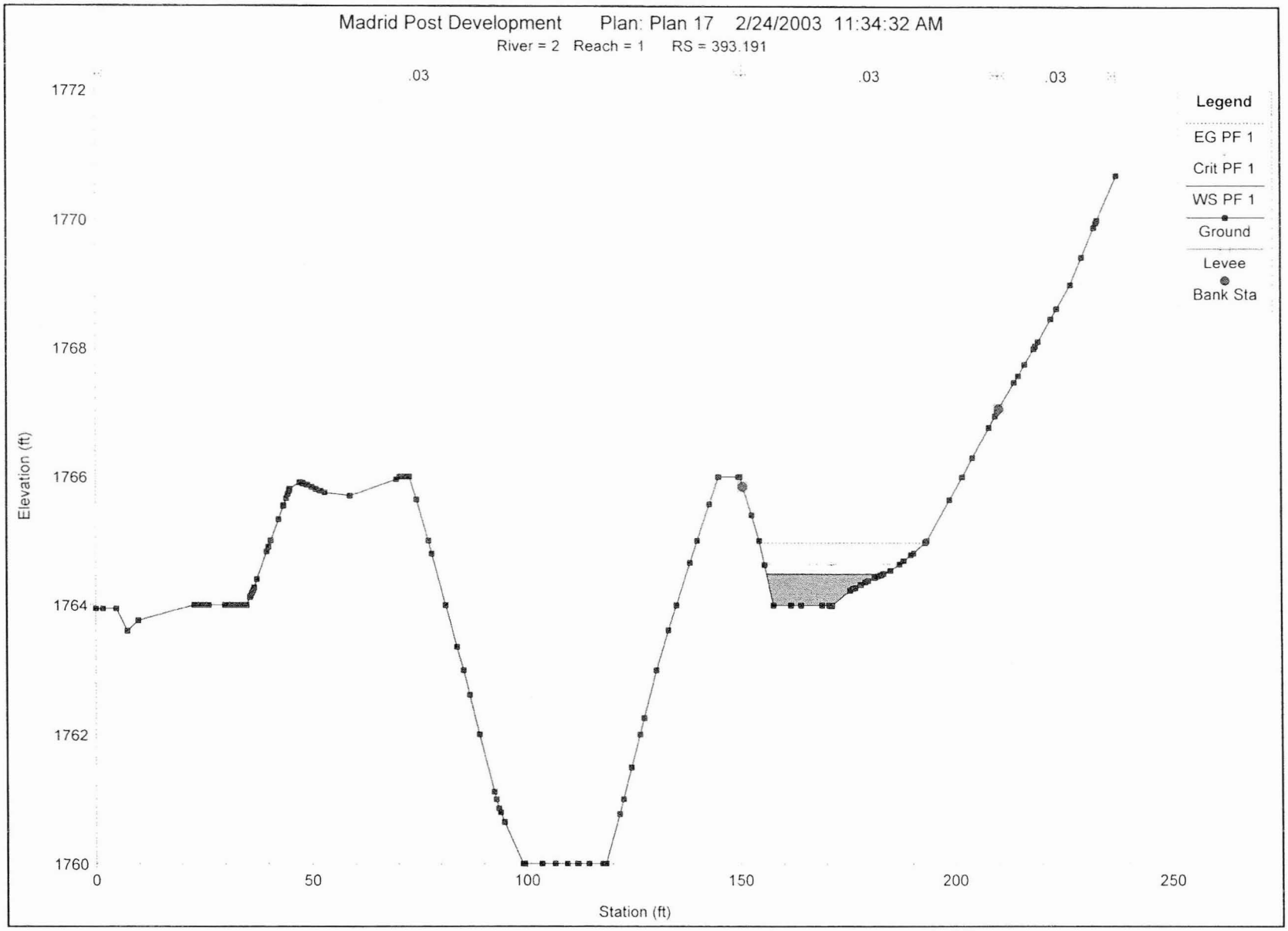

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 779.309
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1784
1782
1780
1778
1776
1774
1772
1770
0
100
200
300
400
Station (ft)

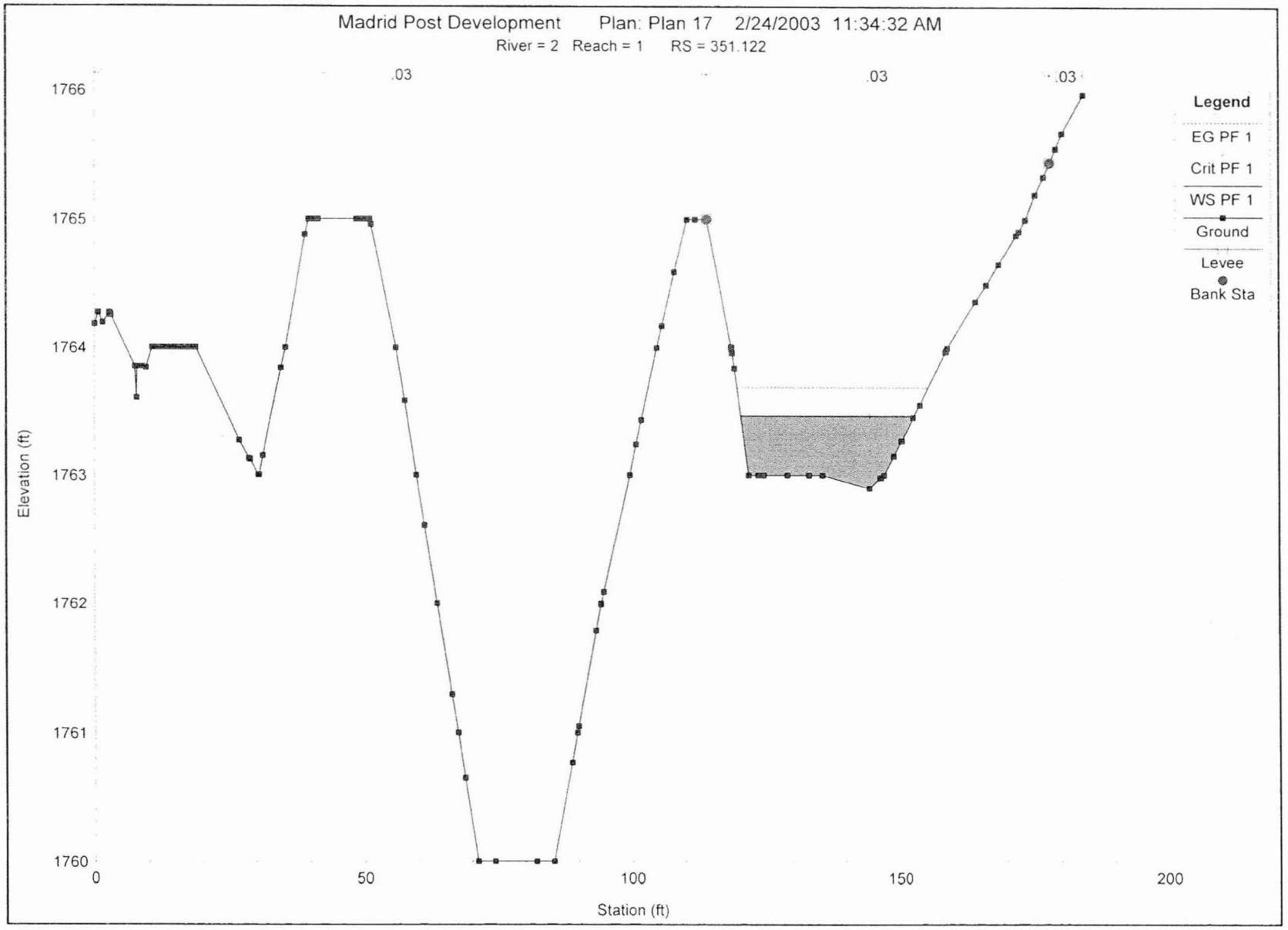

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 693.224
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1780
1778
1776
1774
1772
1770
1768
0
50
100
150
200
250
Station (ft)

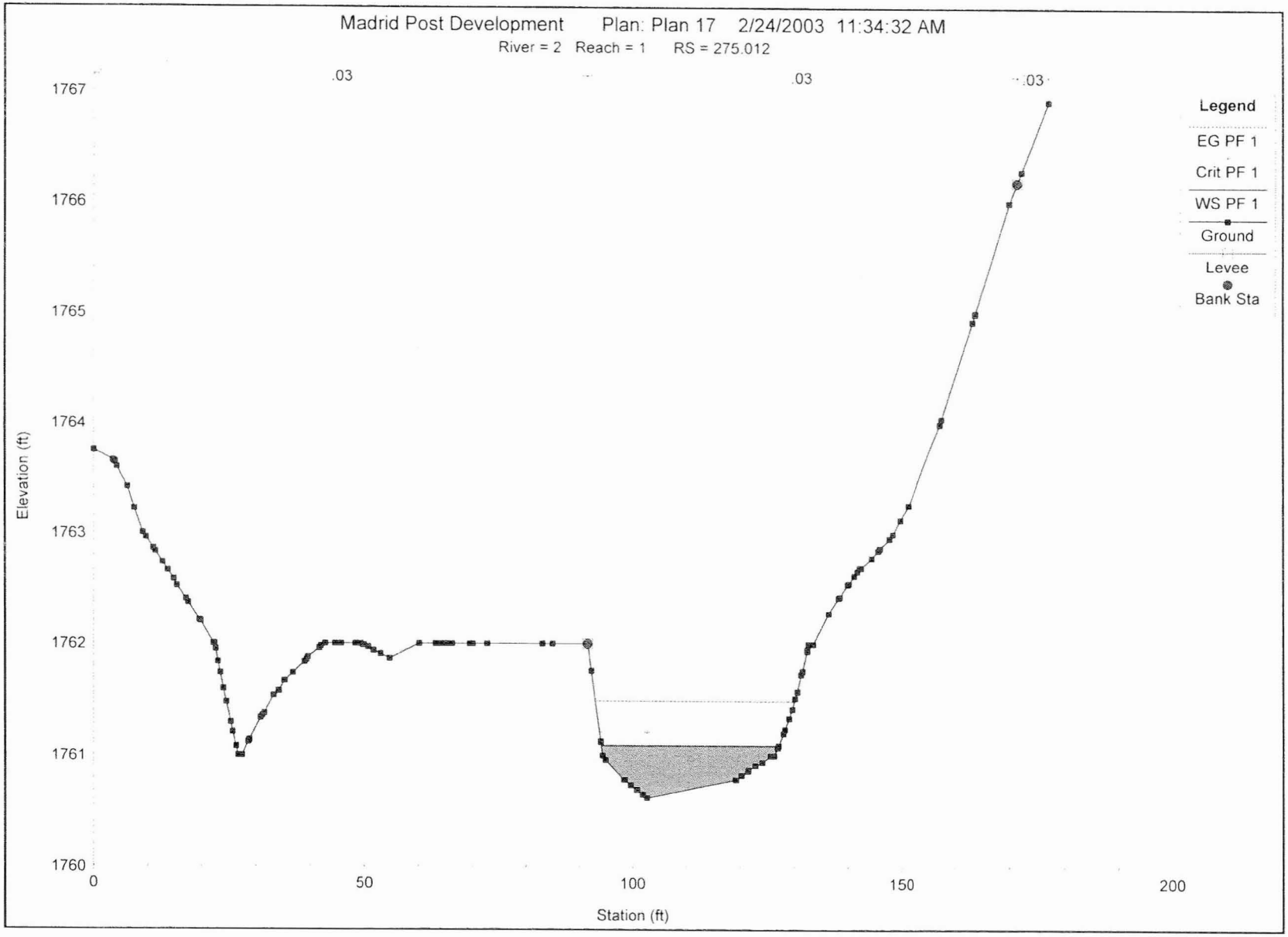

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 596.519
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1777
1776
1775
1774
1773
1772
1771
0
50
100
150
200
Station (ft)

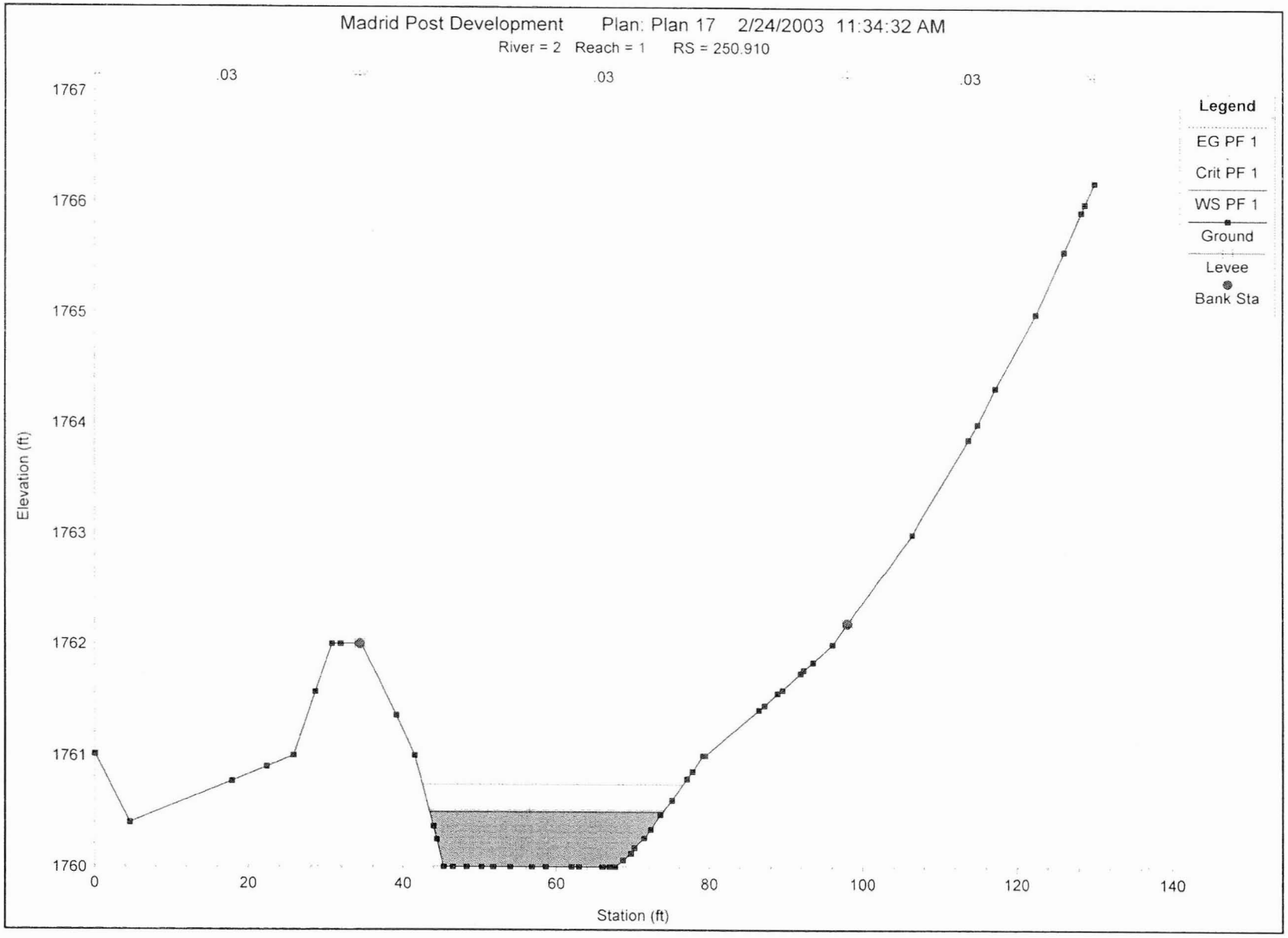

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 515.146
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1778
1776
1774
1772
1770
1768
1766
0
50
100
150
200
250
300
Station (ft)

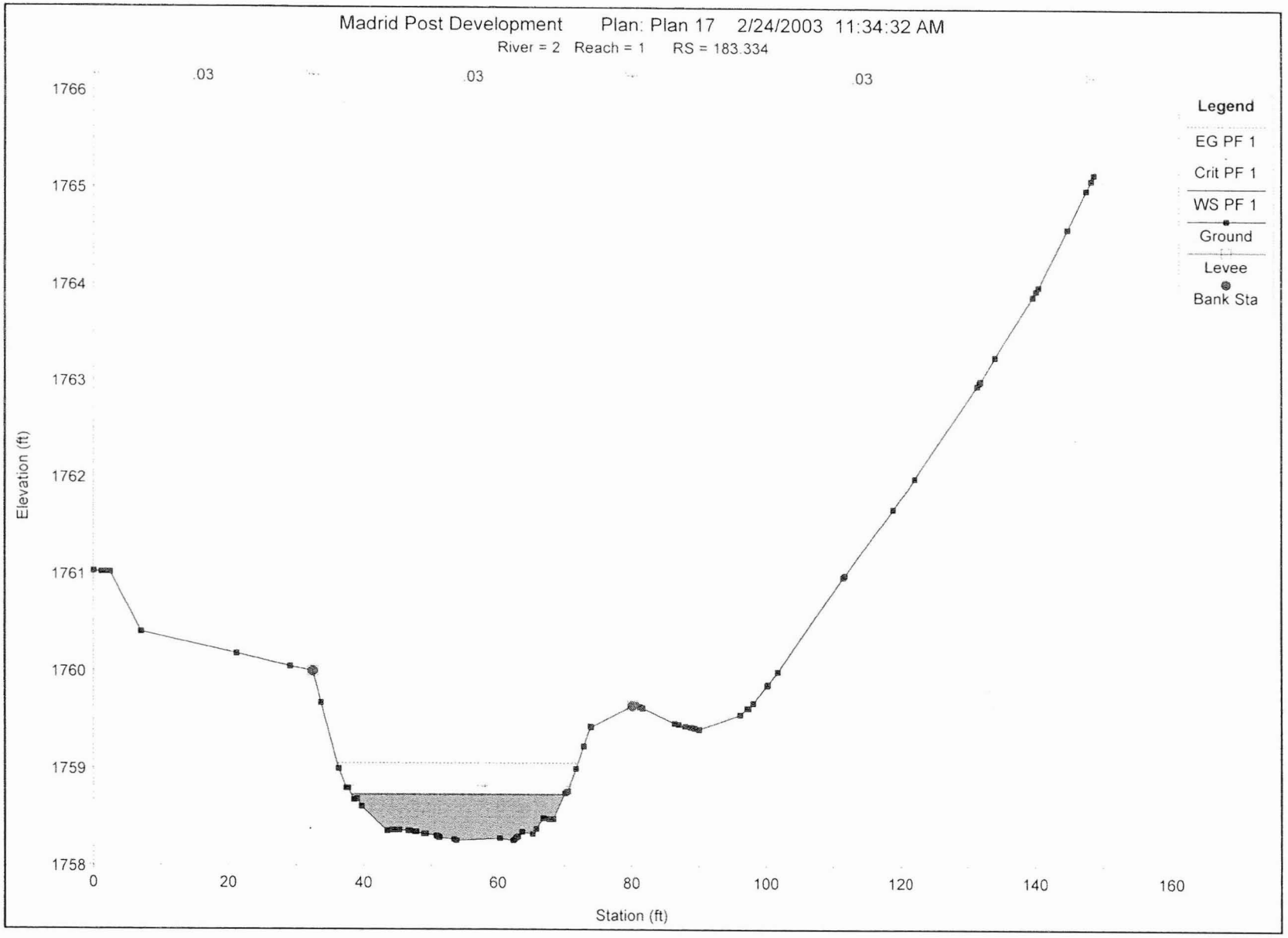

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 483.738
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1778
1776
1774
1772
1770
1768
1766
1764
1762
0
50
100
150
200
250
300
Station (ft)

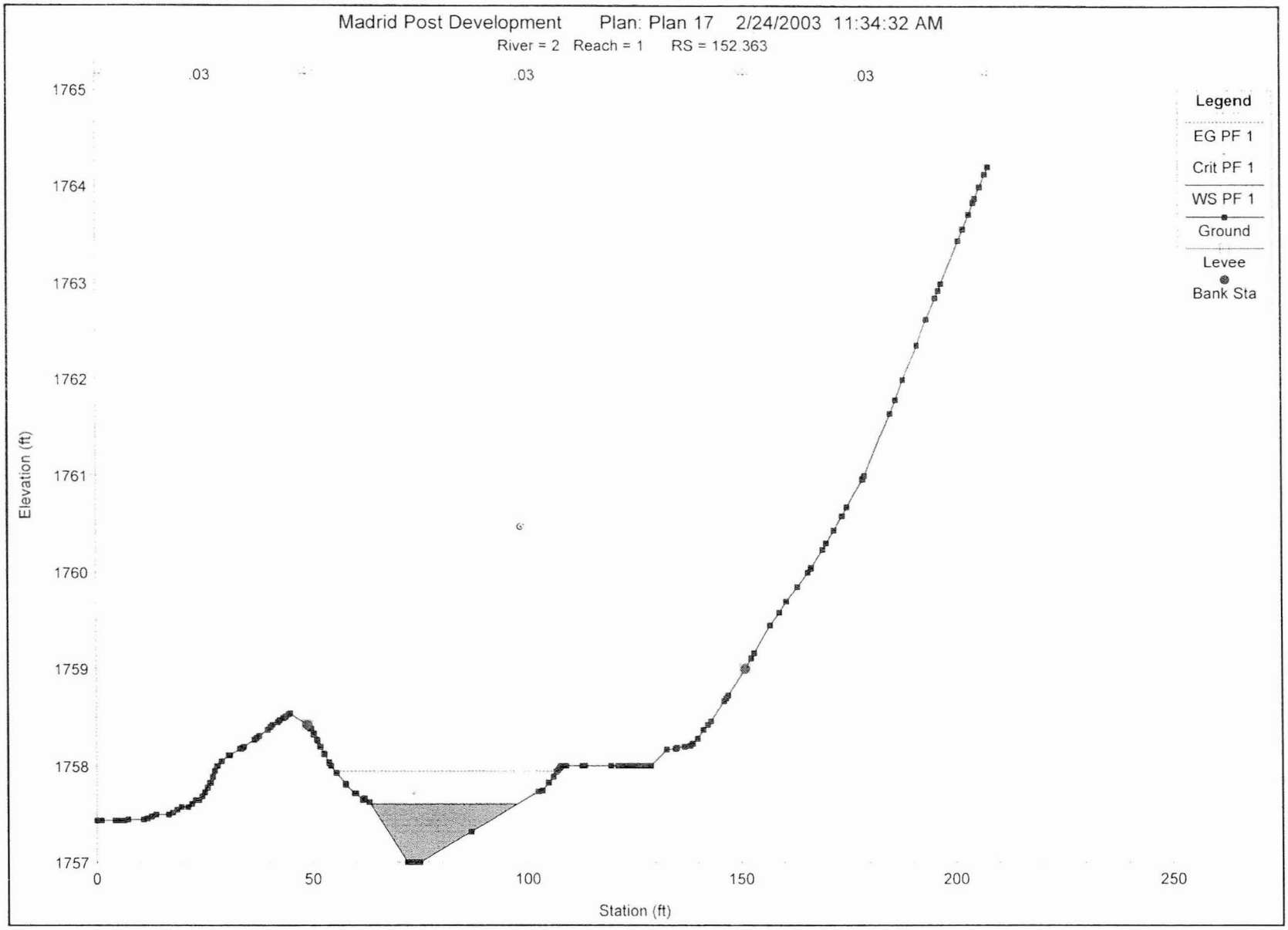

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 393.191
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1772
1770
1768
1766
1764
1762
1760
0
50
100
150
200
250
Station (ft)

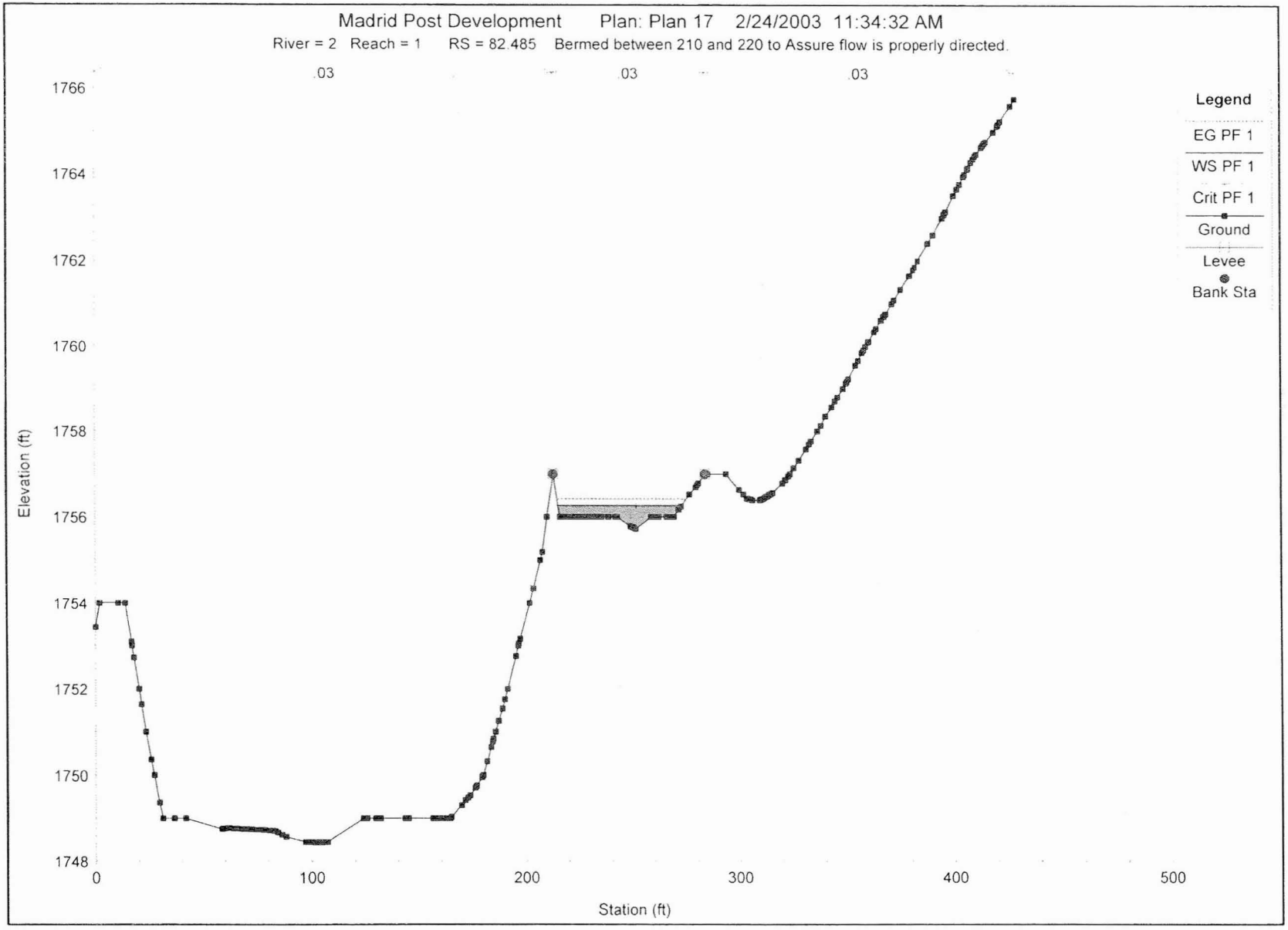

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 351.122
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1766
1765
1764
1763
1762
1761
1760
0
50
100
150
200
Station (ft)

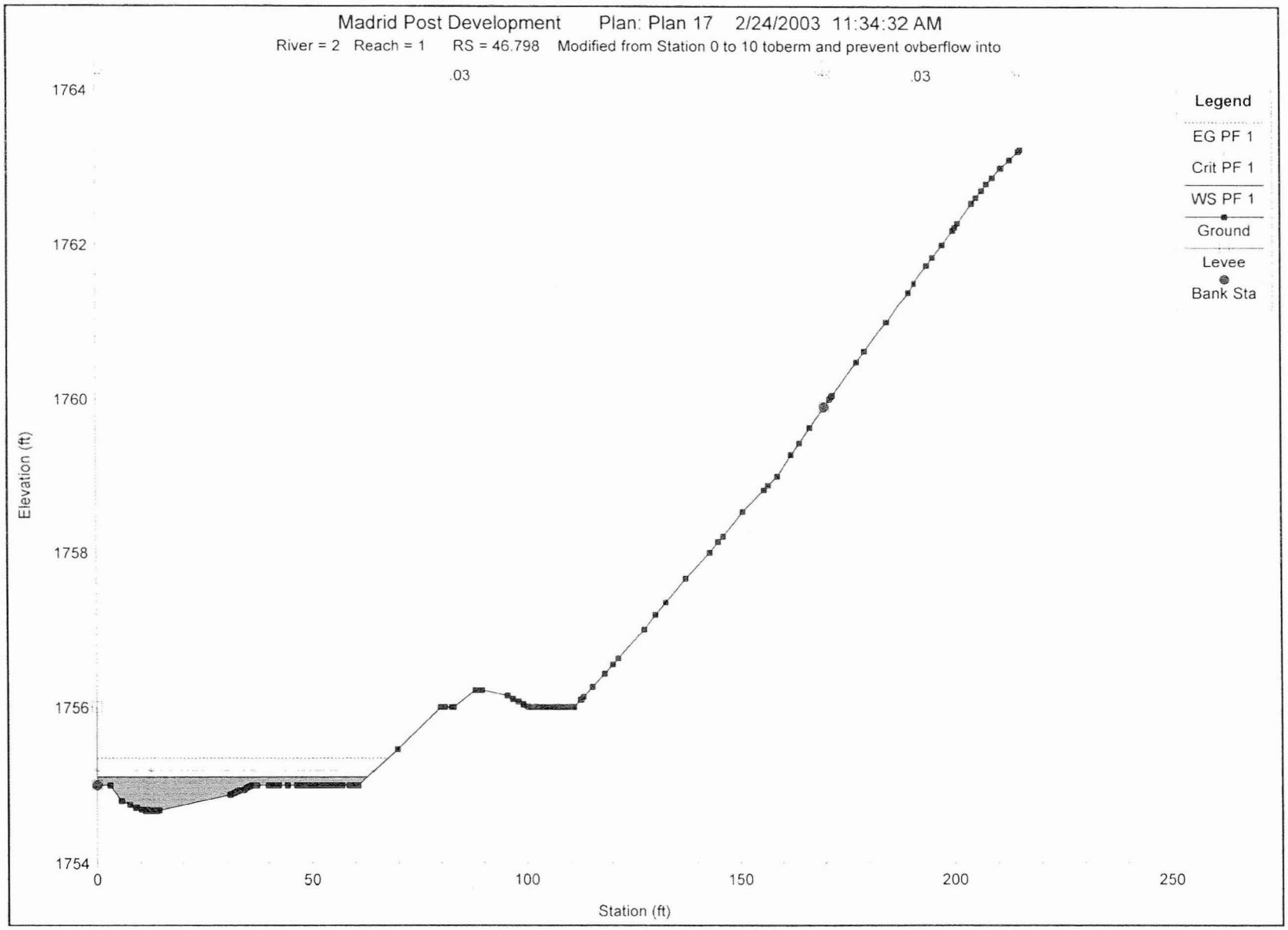

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 275.012
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1767
1766
1765
1764
1763
1762
1761
1760
0
50
100
150
200
Station (ft)

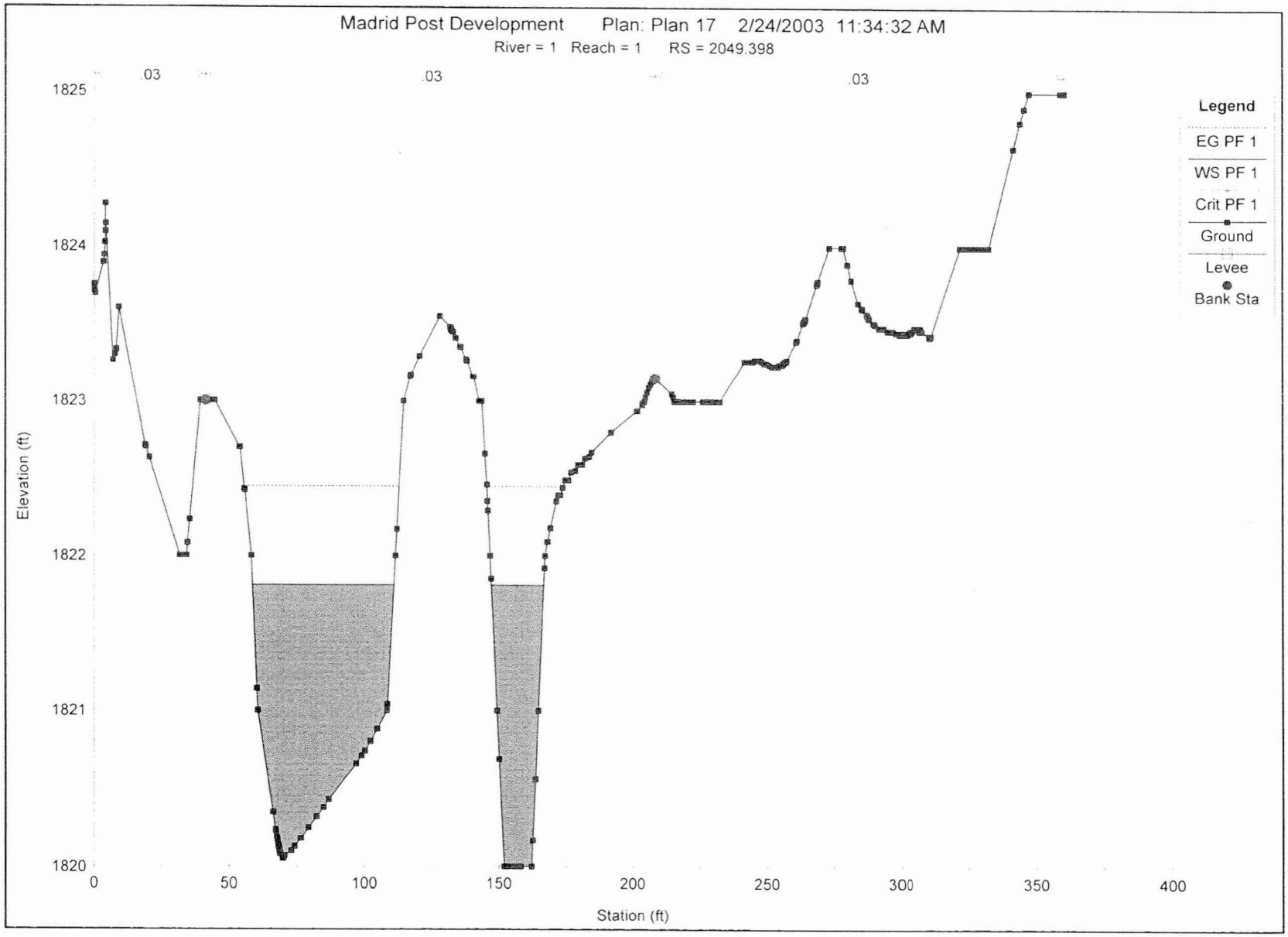

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 250.910
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1767
1766
1765
1764
1763
1762
1761
1760
0
20
40
60
80
100
120
140
Station (ft)

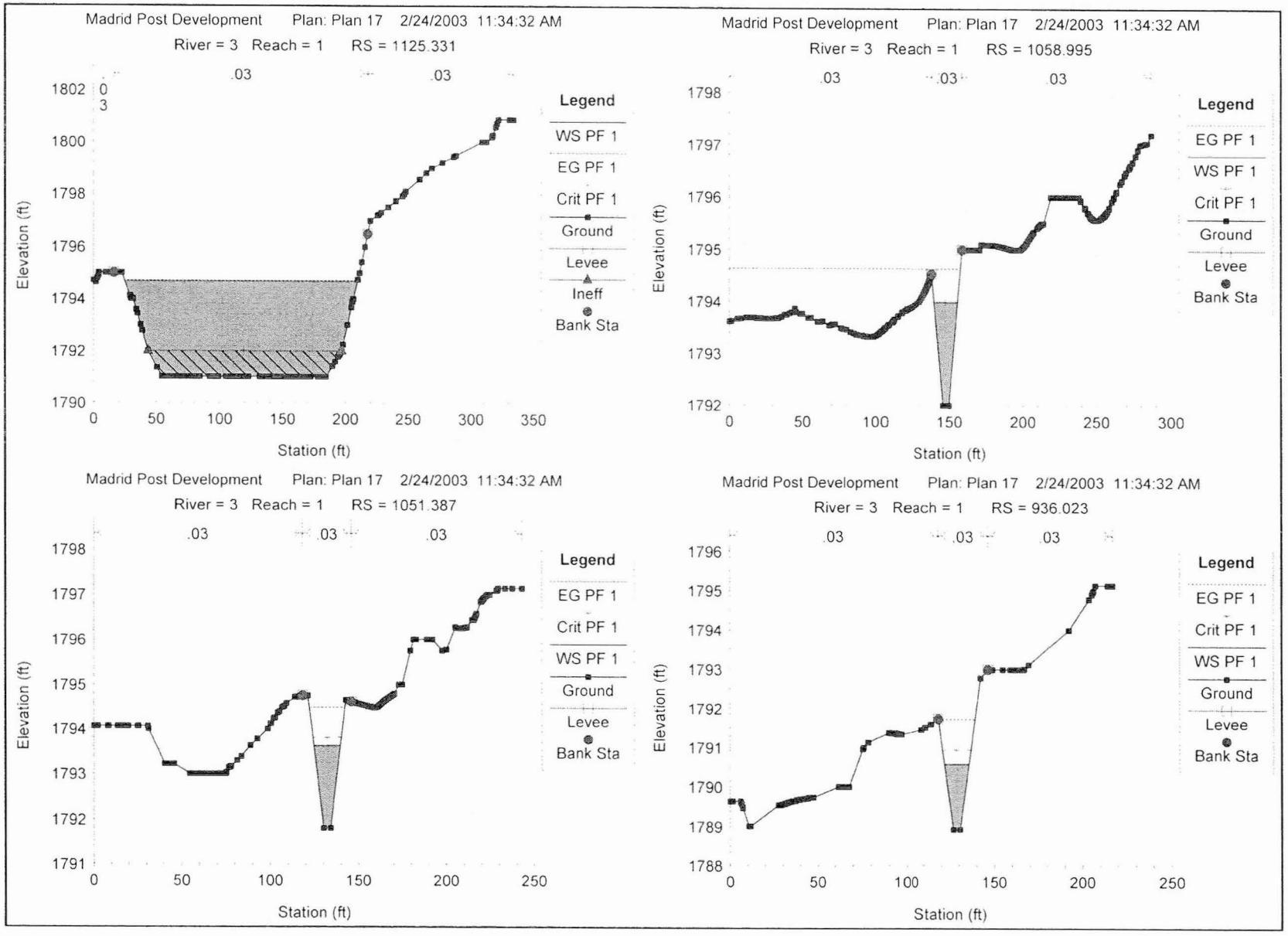

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 183.334
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1766
1765
1764
1763
1762
1761
1760
1759
1758
0
20
40
60
80
100
120
140
160
Station (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 152.363
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1765
1764
1763
1762
1761
1760
1759
1758
1757
0
50
100
150
200
250
Station (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 82.485 Bermed between 210 and 220 to Assure flow is properly directed.
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1766
1764
1762
1760
1758
1756
1754
1752
1750
1748
0
100
200
300
400
500
Station (ft)

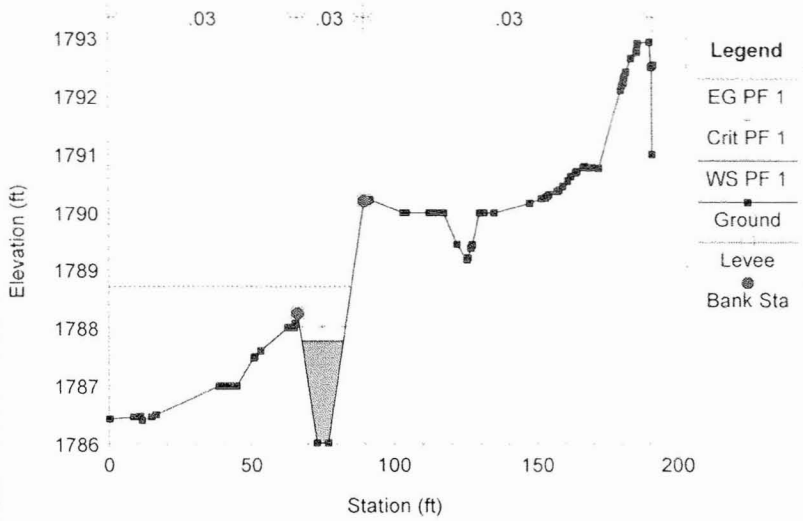

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 2 Reach = 1 RS = 46.798 Modified from Station 0 to 10 toberm and prevent ovberflow into
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
1764
1762
1760
1758
1756
1754
0
50
100
150
200
250
Station (ft)


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 2049.398
.03
.03
.03
1825
1824
1823
1822
1821
1820
Elevation (ft)
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 1125.331
.03 .03
Legend
WS PF 1
EG PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 1058.995
.03 .03 .03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 1051.387
.03 .03 .03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 936.023
.03 .03 .03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

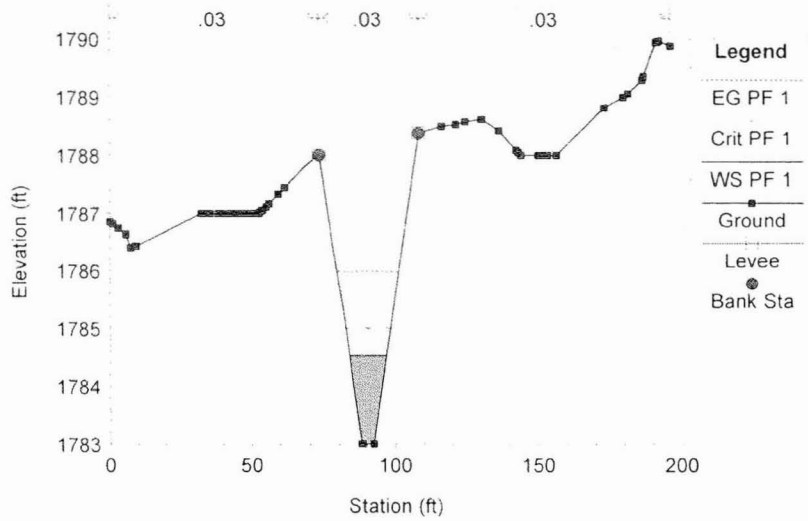
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 3 Reach = 1 RS = 819.468



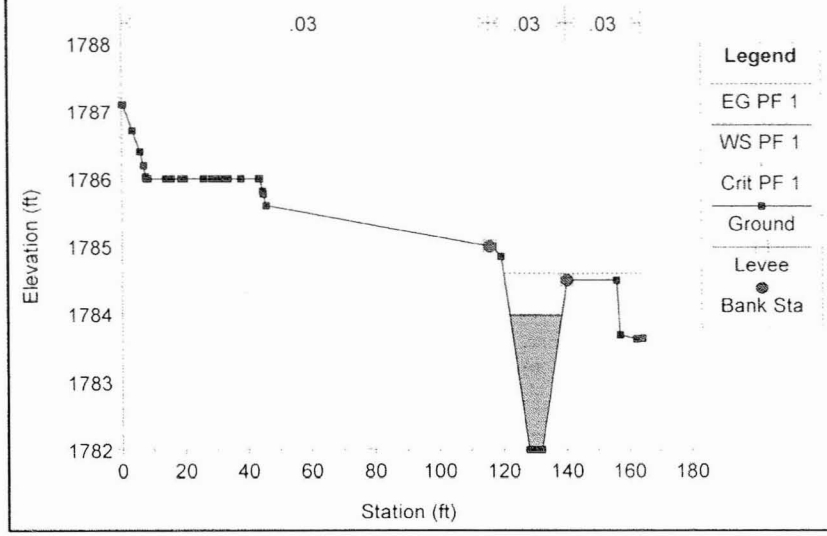
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 3 Reach = 1 RS = 728.193



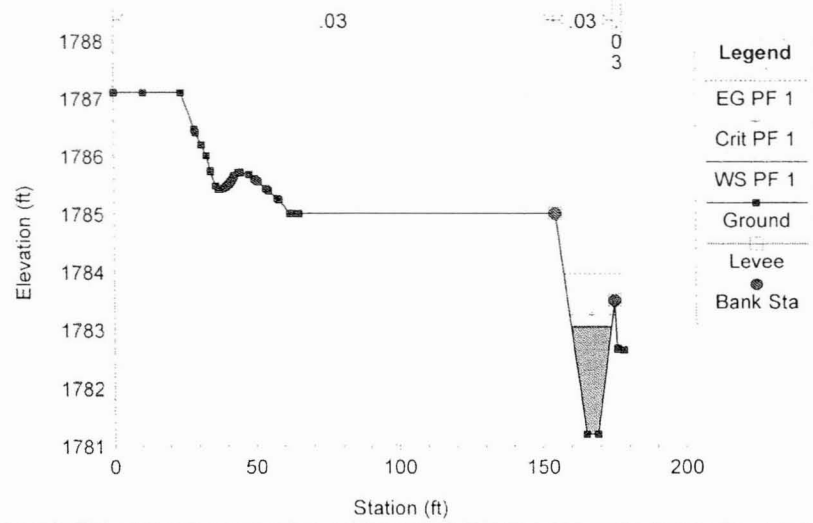
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 3 Reach = 1 RS = 644.92 Manually entered from 45 to 157



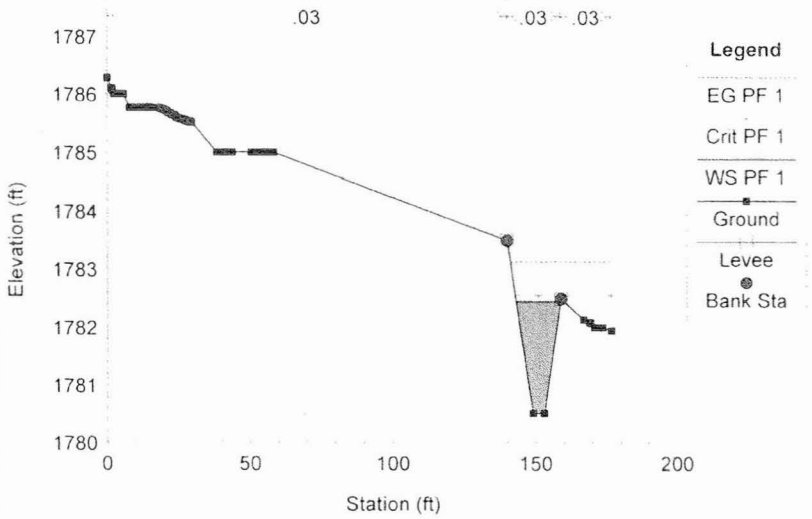
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 3 Reach = 1 RS = 606.323 Hand entered data from 65 to 175 Pad starts at 150



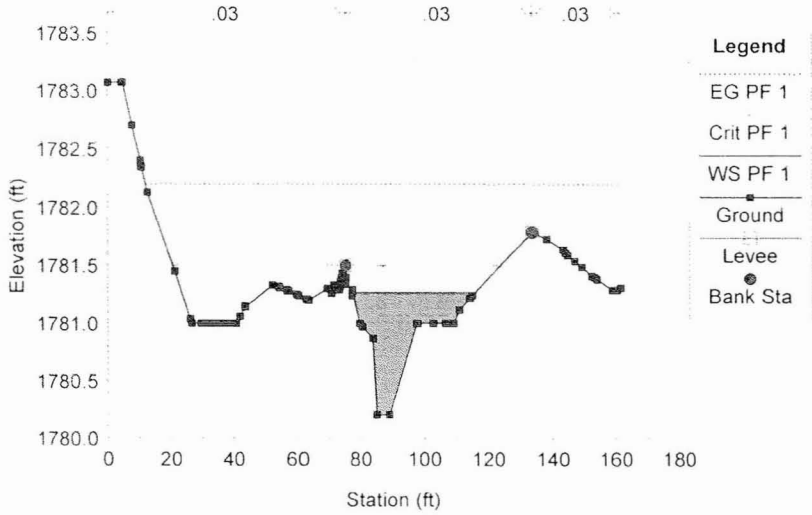
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 3 Reach = 1 RS = 556.14 Manually input geometry between 60 and 160. Pad at 140 and



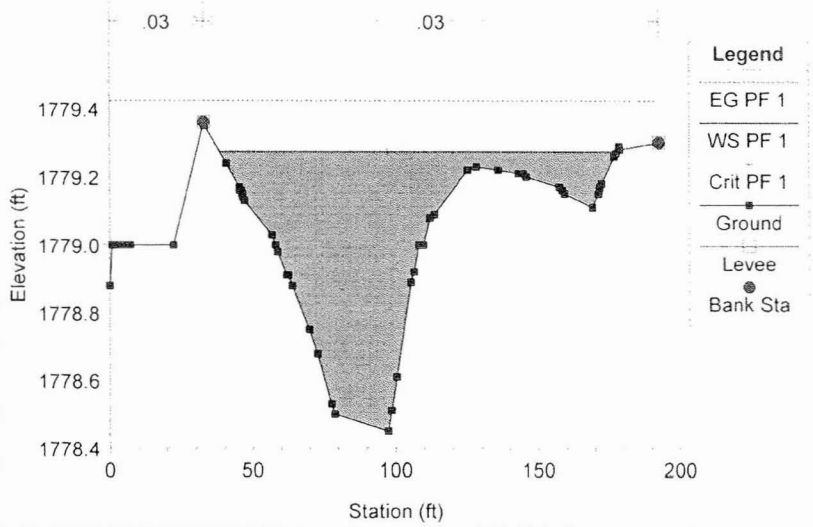
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

River = 3 Reach = 1 RS = 471.466 Modified between 75 (property line) and 125 (wall) Note that the



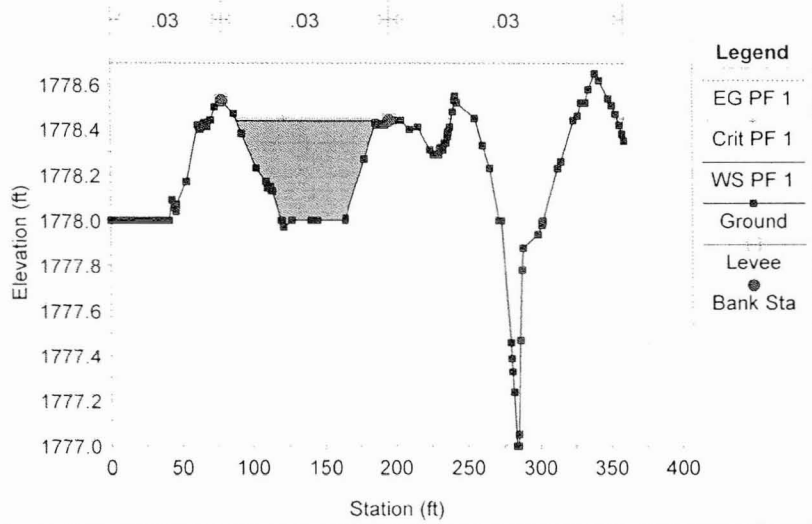
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

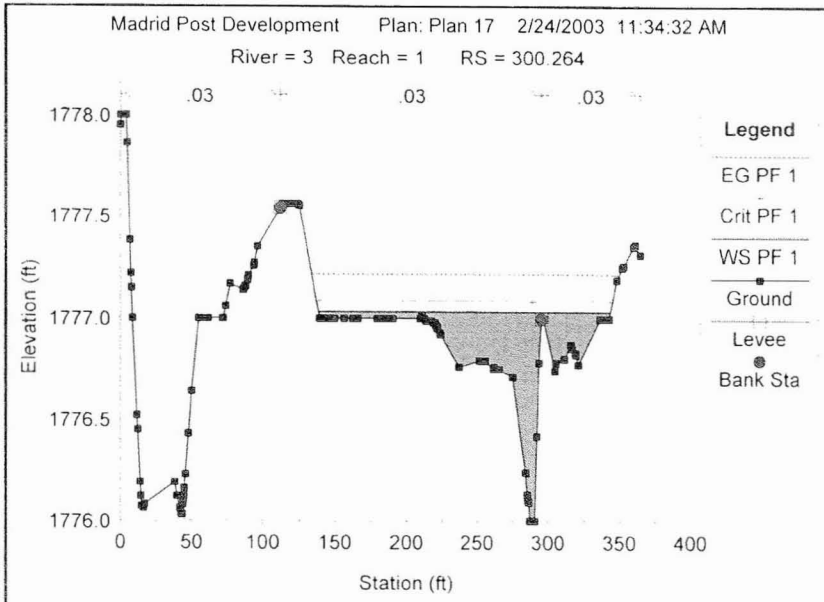
River = 3 Reach = 1 RS = 364.861

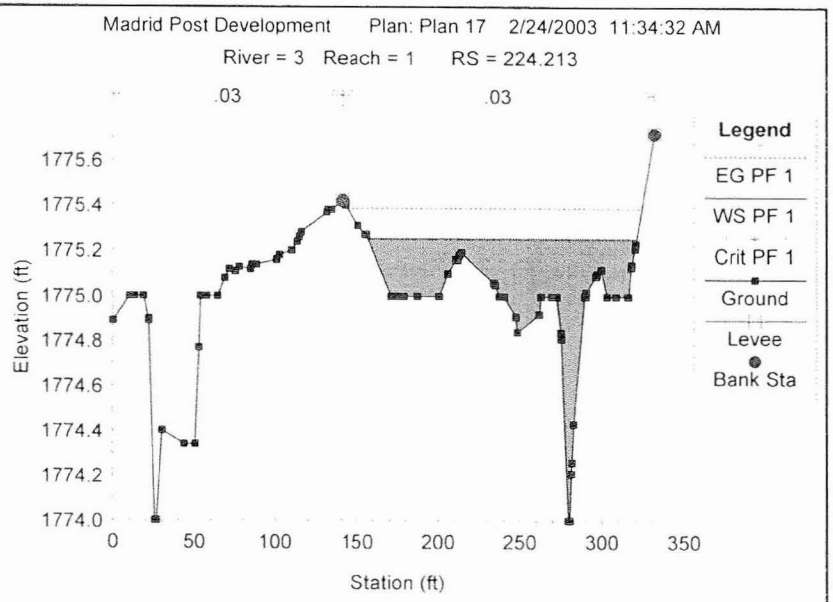


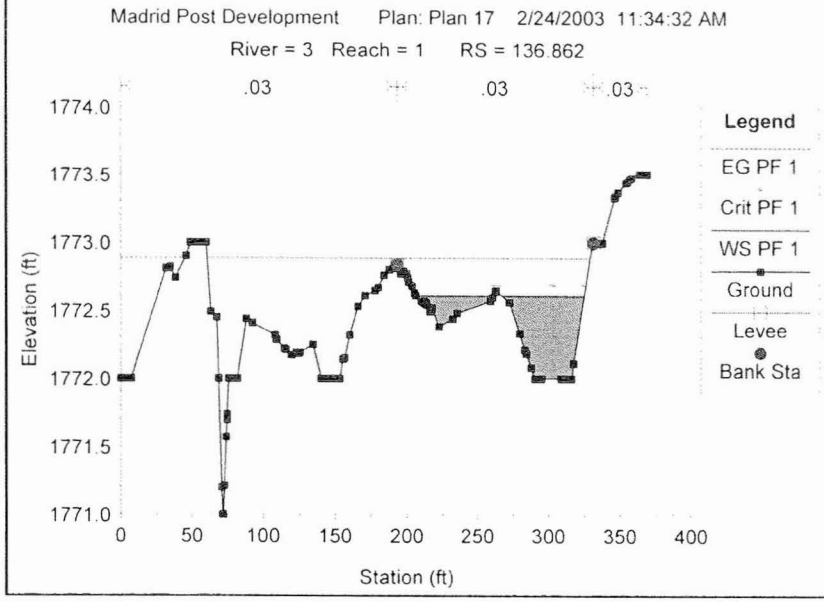
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM

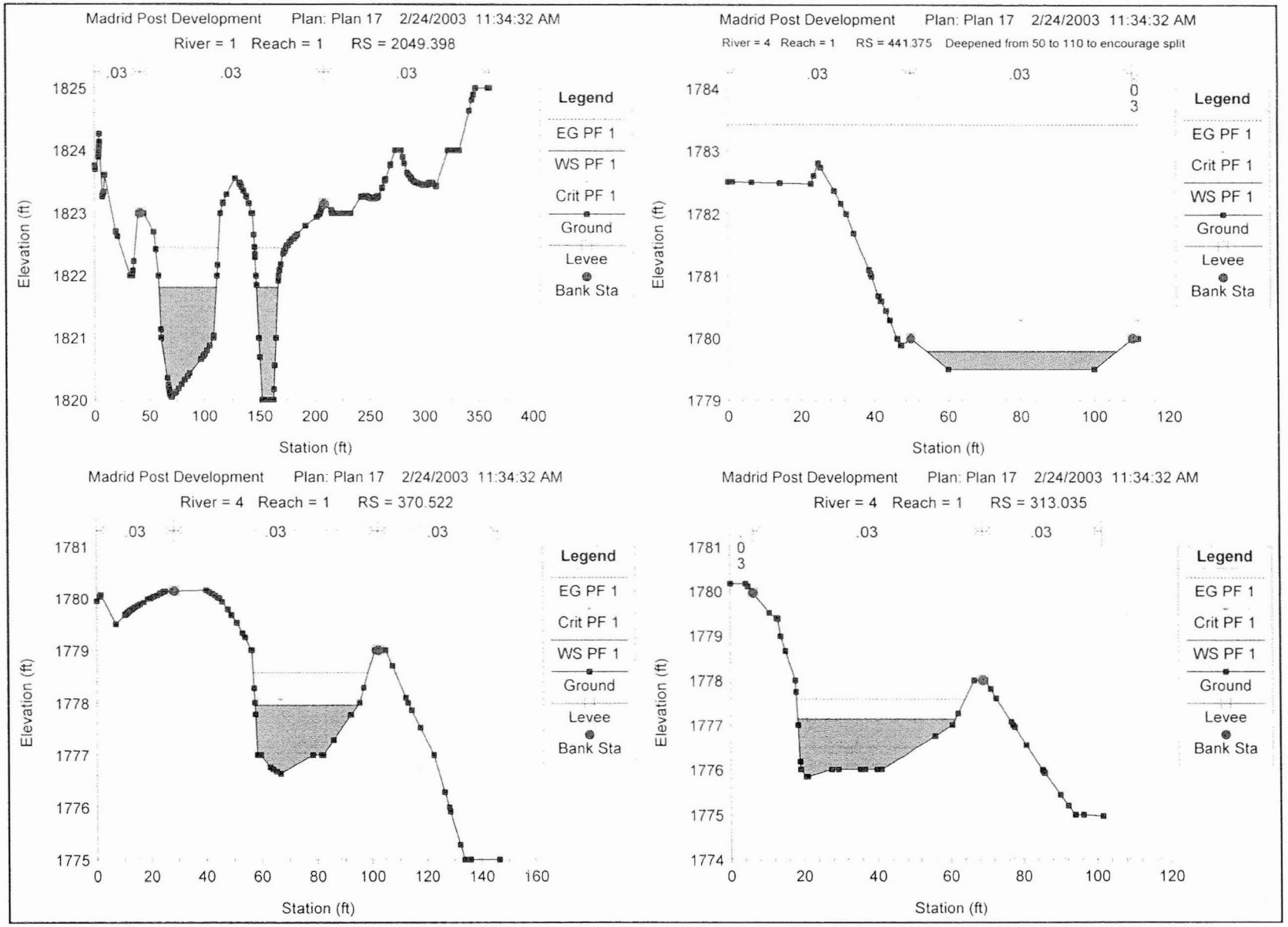
River = 3 Reach = 1 RS = 336.632

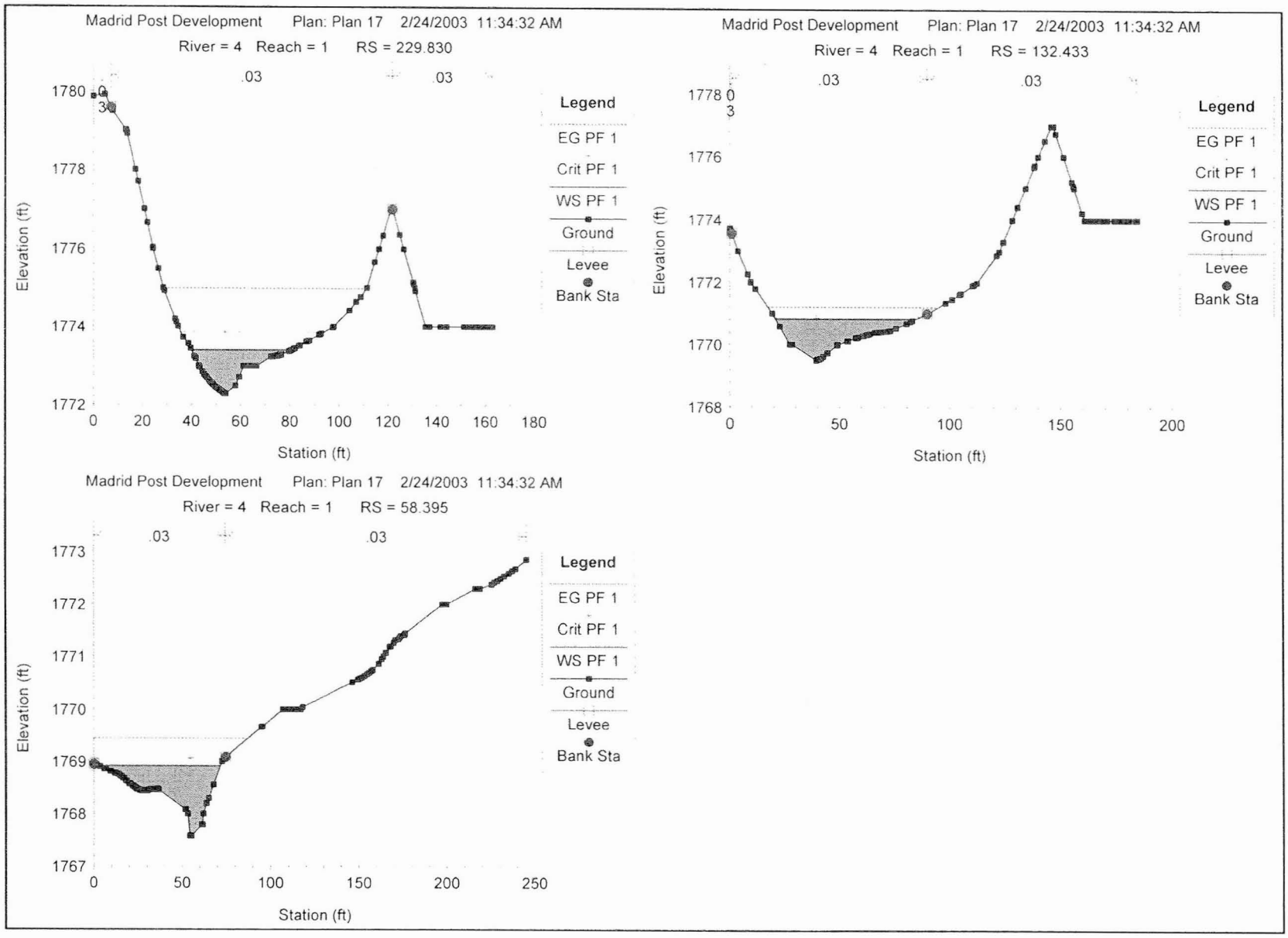



Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 300.264
.03
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta

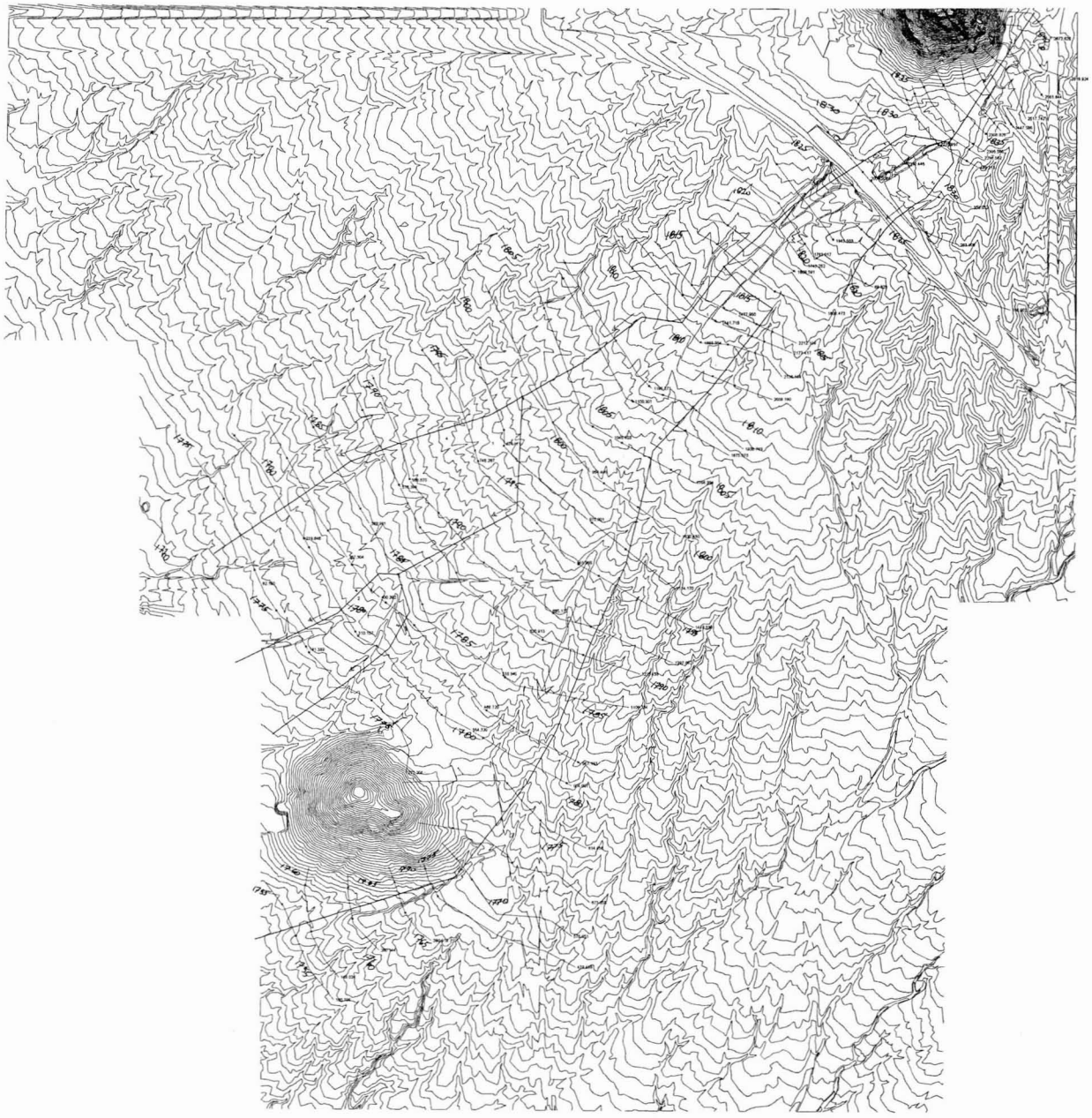

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 224.213
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 3 Reach = 1 RS = 136.862
.03
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta

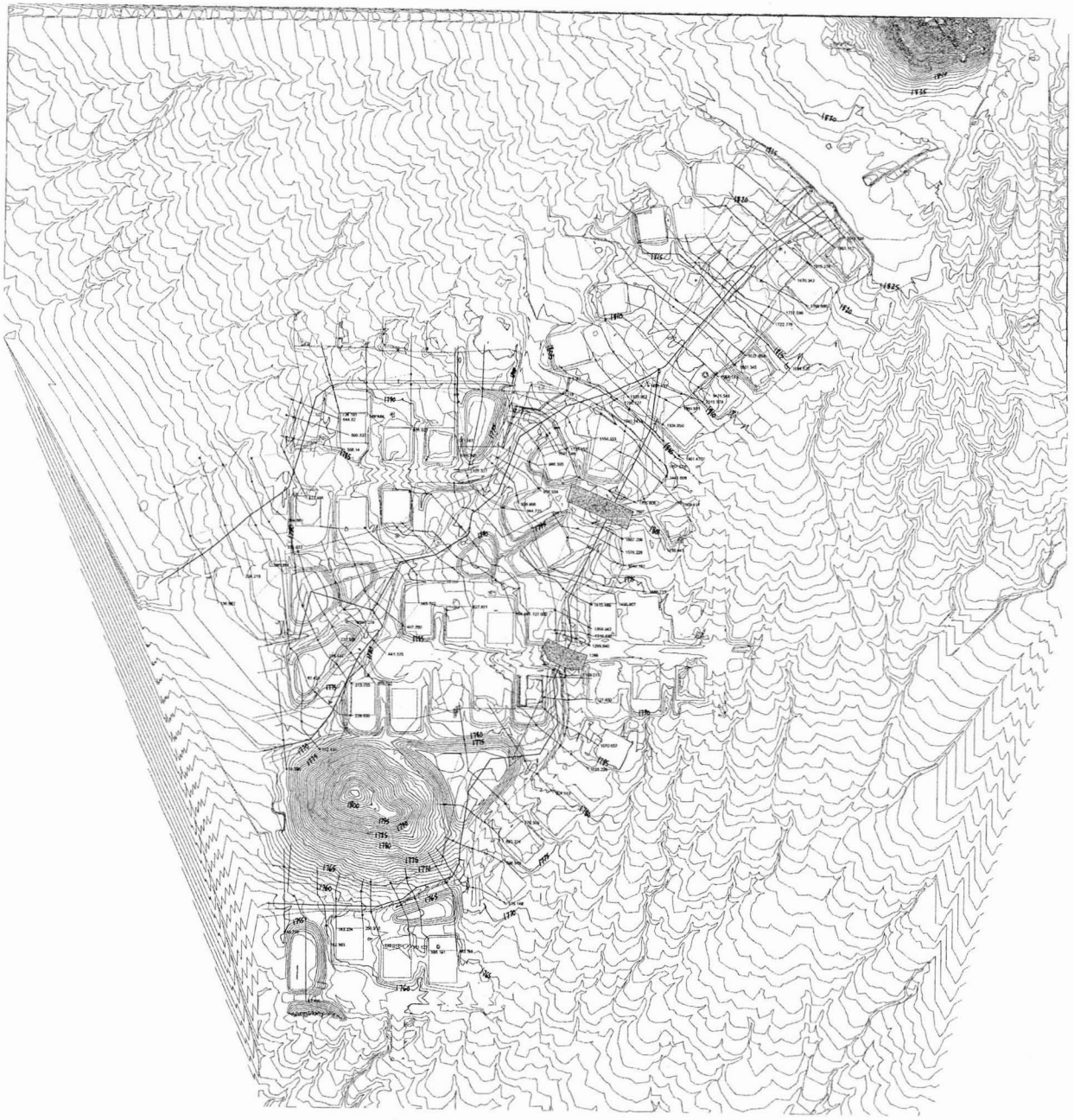

Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 1 Reach = 1 RS = 2049.398
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 4 Reach = 1 RS = 441.375 Deepened from 50 to 110 to encourage split
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 4 Reach = 1 RS = 370.522
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 4 Reach = 1 RS = 313.035
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta


Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 4 Reach = 1 RS = 229.830
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 4 Reach = 1 RS = 132.433
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Madrid Post Development Plan: Plan 17 2/24/2003 11:34:32 AM
River = 4 Reach = 1 RS = 58.395
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta

WATERLEY ROAD
90th STREET
MCDOWELL ROAD
CULVERT 1
CULVERT 2
CULVERT 3
CHANNEL 2
CP-B
CP-C
CP-E
CP-F
CP-Plot
Sub Plot
BASIN A
BASIN B
BASIN C
BASIN D
BASIN E
BASIN F
BASIN G
BASIN H
BASIN I
BASIN J
BASIN K
BASIN L
BASIN M
BASIN N
BASIN O
BASIN P
TRACT I
TRACT K
*DISCHARGES IN THE FLOW SPLITS DETERMINED IN THE D & M AMENDED DRAINAGE REPORT.
N
BAR SCALE
0 50 100 200
Scale 1" = 100'
LEGEND
DA-C Drainage Area Identification
CP-C Concentration Point Identification
Drainage Broundary Line
130+90 HEC-RAS Cross-Section ID
HEC-RAS Cross Section
130+00 HEC-RAS Centerline with station
Flow Direction
Culvert
Concentration Point Location
JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
FIG 4: ON-SITE DRAINAGE MAP
FOR MADRID
MESA, ARIZONA
SHEET 1 OF 1



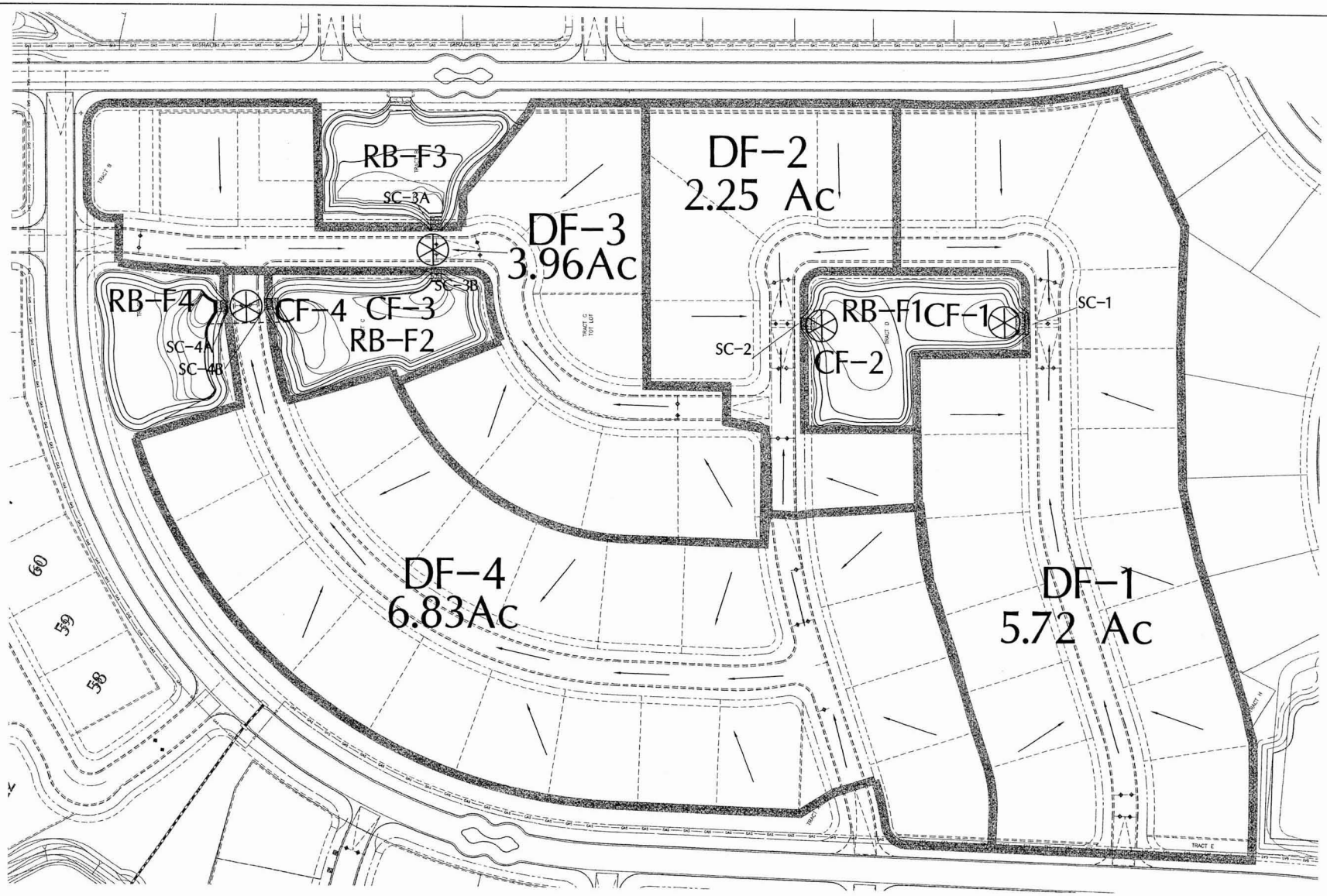
MADRID HEC-RAS
PRE-DEVELOPMENT



MADRID HEC-RAS

(PROPOSED) POST- DEVELOPMENT

NOTE: CONTOURS SHOWN ARE AS-BUILT IN THE REGION OF THE MODEL WHERE AVAILABLE. THE CONTOURS DO NOT INCLUDE PROPOSED IMPROVEMENTS.



LEGEND	
⊗	Concentration Point Location
CF-1	Concentration Point Identification
——	Drainage Area Boundary
DA-1	Drainage Area Identification
——	Flow Direction
⊳⊲	Culvert
RB-F1	Retention Basin Identification

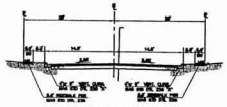


FIGURE 3: ON-SITE DRAINAGE MAP

0 25' 50' 100' 150'
1" = 50' HORIZ.

The warning stops before you dig CALL FOR THE BLUE STAKES
602-263-1100
1-800-STAKE-IT
OUTSIDE MARICOPA COUNTY

JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4151 NORTH MARSHALL WAY, SUITE 12 SCOTTSDALE, AZ. 85251 480.945.1400

DSN: TMR
CKD: DWL
DATE: 03/03/04
SCALE
HORIZ: 1"=50'
VERT: N/A

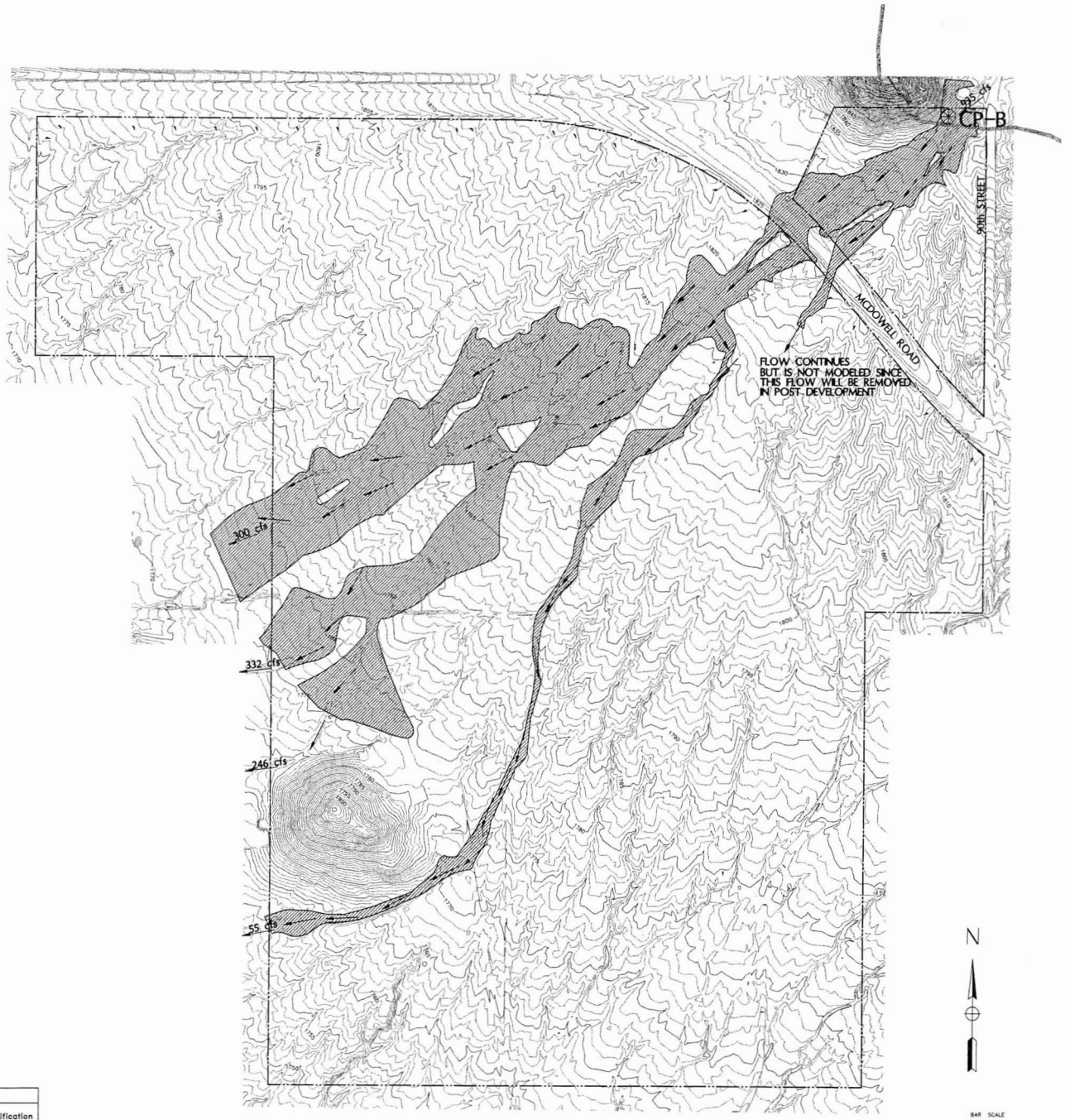
FIGURE 3: ON-SITE DRAINAGE MAP FOR PARCEL F AT SOSSAMAN ESTATES

JOB# 03844.01
SHEET 1 OF 1

LEGEND
HEC-RAS Proposed Floodplain
Flow Direction

JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4155 NORTH MARSHALL WAY, SUITE 12 SCOTTSDALE, AZ 85251 (480) 945-1400

DSN: DSG CKD: MCG DATE: 09/20/02 SCALE HORIZ: 1"=100' VERT: N/A	FIG 8: ON-SITE TOPOGRAPHY PROPOSED HEC-RAS FOR MADRID	JOB# 00214.06 SHEET 1 OF 1



LEGEND

CP-B	Concentration Point Identification
⊛	Concentration Point Location
	Drainage Broundary Line
	HEC-RAS Floodplain
	Flow Direction

JMI & ASSOCIATES
CONSULTING CIVIL ENGINEERS
4125 NORTH MARIGOLD WAY STATE 13 SCOTTSDALE, AZ. 85251 (480) 946-1491

DSN: DSG CKD: MCG DATE: 02/17/03 SCALE HORIZ: 1"=100' VERT:	FIG 6: ON-SITE TOPOGRAPHY HEC-RAS PRE-DEVELOPMENT FOR MADRID	JMI# 00514.06 SHEET 1 of 1