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August 24, 2007
Revised October 19, 2007

Mr. Jim Fox
Butler County Department of Development
130 High Street
Hamilton, Ohio 45011

Re: Windisch Road Site, Buildings 6 and 7
Floodway Study

Dear Mr. Fox:

The following items are being submitted in support of a flood hazard area permit for proposed buildings 6 and 7 located in the existing commercial development east of Windisch Road.

1. One copy of the Effective Flood Insurance Study for the Mill Creek.
2. One copy of the Duplicate Effective Model of the Flood Insurance Study.
3. One copy of the Revised Model - Existing Conditions.
4. One copy of the Revised Model - Proposed Conditions.
5. One copy each of the existing and proposed site plans showing the regulatory floodway limits and the study cross section locations.
6. One copy of the floodplain cut/fill balance calculations.

The purpose of this study was to determine the effect of proposed improvements on the 100-year water surface elevation within the regulatory floodway and analyze the flood storage capacity of the floodplain. The study will compare the difference in the water surface elevations between the Revised Model Existing Conditions and the Revised Model Proposed Conditions.

Effective Flood Insurance Study

A copy of the Effective Flood Insurance Study (FIS) EMW-93-C-4106 for the Mill Creek is attached. The study calculated the 10, 50, 100 and 500-year water surface profiles for the natural stream section and determined the limits of the regulatory floodway for a 100-year recurrence interval storm. A summary of the Effective FIS Model results is provided on page 2.

Duplicate Effective Model

A data file was developed using the information contained in the Effective FIS to create a Duplicate Effective Model. Using the data file, the HEC2 computer program calculated the water surface profile within the limits of the regulatory floodway for a 100-year recurrence interval. The Duplicate Effective Model was completed to assure that the Effective FIS model data was input properly prior to further modeling. The study area of the Effective FIS extends for miles north of the limits of the project site, therefore the study area of the Duplicate Effective Model was shortened considerably beginning at Butler County Section E (section number 17.4).

The results of the Duplicate Effective Model matched the published results of the Effective FIS. A summary of the Duplicate Effective Model results is provided on page 2.

Revised Model Existing Conditions

A revised model using current site topography was developed to determine the limits of the regulatory floodway for a 100-year recurrence interval on the existing site. The Duplicate Effective Model was used as the basis for developing the Revised Existing Conditions Model. One cross section, B2, was added to the model to more effectively analyze the existing (and proposed enlarged) retention basin. Section B2 is located between the existing Section B and Section C. Section B2 data was obtained from a combination of aerial and field surveys. In addition to adding Section B2, portions of both Section C and Section D of the Duplicate Effective Model were revised/updated with data from the field survey.

A lake currently resides within the left over bank between the Windisch Road downstream bridge section (section number 17.2) and Butler County Section C (section number 16.0). The lake acts as an ineffective flow area until it overtops the embankment at the south end of the lake at elevation 582.50. The ineffective flow areas of the Windisch Road downstream bridge section and the Section D geometry were blocked out using the X3 card. The right over bank and main channel portions of the sections for this model are identical to those of the Duplicate Effective Model.

All of the sections were artificially terminated on both the left and right sides at stations corresponding to the limits of the regulatory floodway using the ET card. These encroachment stations were computed in the Effective FIS and verified by the Duplicate Effective Model. The encroachment stations for the new Section B2 were obtained from the current mapped floodway limits. A summary of the computed water surface elevations for the Revised Model Existing Conditions is shown below.

Revised Model Proposed Conditions

The Revised Model Existing Conditions was changed to reflect all proposed improvements within the regulatory floodway as shown on the proposed site plan. Changes to the model included the left over bank of sections B2, C and D. Areas of the section below the embankment elevation south of the lake (582.50) were considered ineffective for conveying floodwater and blocked out using the X3 card. The right over bank and main channel portions of the sections for this model are identical to those of the Revised Model Existing Conditions,

A summary of the computed water surface elevations for each model is shown below. The elevations computed using the proposed conditions were found to be equal to or less than those computed using existing conditions.

HYDRAULIC MODELING SUMMARY
100 Year Water Surface Elevations with Floodway

Section	Section Number	Effective FIS	Duplicate FIS	Revised Model Existing Condition	Revised Model Proposed Condition
Crescentville Rd. Bridge	14.2	585.46	585.46	585.46	585.46
Crescentville Rd. Bridge	14.3	585.82	585.82	585.82	585.82
Butler County Section A	14.4	586.33	586.33	586.33	586.33
Butler County Section B	15.0	586.59	586.59	586.59	586.59
New Section, B2	15.5	NA	NA	586.88	586.88
Butler County Section C	16.0	587.08	587.08	586.99	586.97
Butler County Section D	17.1	587.15	587.15	587.02	586.98
Windisch Rd. Bridge	17.2	587.23	587.23	587.03	586.99
Windisch Rd. Bridge	17.3	587.24	587.24	587.05	587.02
Butler County Section E	17.4	587.39	587.39	587.23	587.20

Cut/Fill Analysis

The proposed site plan was analyzed from a flood plain volume perspective to ensure any fill placed in the floodplain has been compensated for by an equal or larger volume of cut. Any fill placed above the 100-year water surface elevation was not considered. The 100-year water surface elevation used for the cut/fill analysis is 588.40, which was taken from Station 1590 in the East Fork Mill Creek Flood Control Study prepared by FMSM Engineers in April 2005.

55,426 cubic yards of material are proposed to be placed in the floodplain. 71,298 cubic yards of material are proposed to be cut from the flood plain. The excess cut of 15,872 cubic yards will be utilized for storm water quality volume and storm water detention volume. A copy of the water quality volume calculations and detention calculations are attached. A summary of the cut/fill analysis is shown below. Detailed cut/fill calculations are attached.

FLOOD PLAIN CUT/FILL SUMMARY

Flood Plain Fill = 71,711 C.Y. (Total Fill in Flood Plain)
- 16,285 C.Y. - (Fill Above Flood Plain Elevation, 588.40)
Flood Plain Fill = **55,426 C.Y.**

Total Flood Plain Storage Required = 55,426 C.Y. (Flood Plain Fill)
+ 10,648 C.Y. + (Detention Volume Required)
+ 3,346 C.Y. + (Water Quality Volume Required)
Flood Plain Storage Required = **69,420 C.Y.**

Compensation Volume Provided = **77,503 C.Y.** (Cut in Flood Plain)

71,298 CY

INCLUDED EAST BASIN (DO NOT INCLUDE)

CONCLUSIONS

This study compared the difference in the water surface elevations between the Revised Model Existing Conditions and the Revised Model Proposed Conditions. The hydraulic modeling showed no rise in the 100-year water surface elevations with floodway. The 100-year water surface elevations slightly decreased in the area of the proposed site due to the excavation of the proposed retention basin.

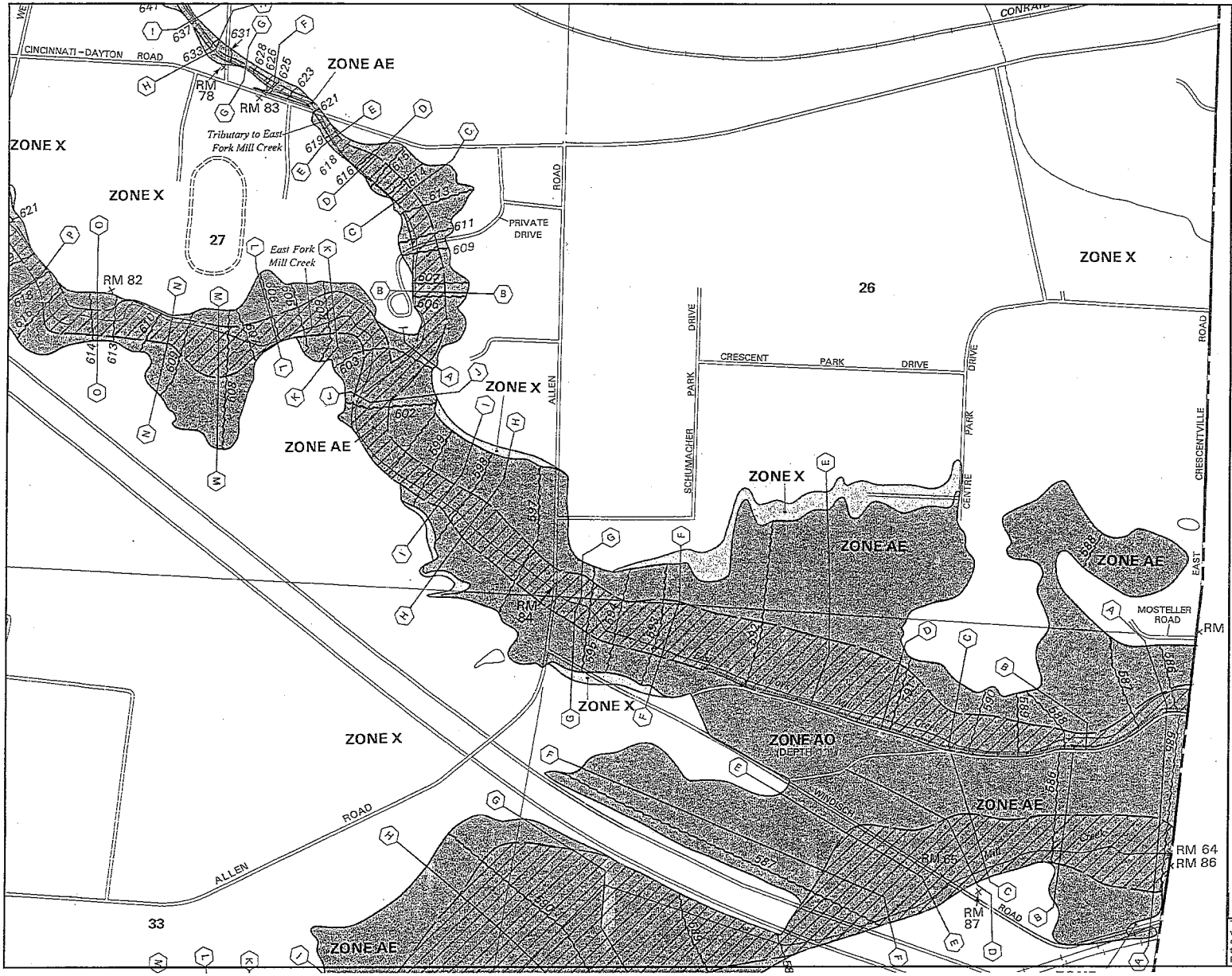
The floodplain cut/fill analysis showed the proposed site meets requirements for placing fill within the floodplain. As required, the amount of proposed cut (compensation volume) exceeds the amount of proposed fill in the floodplain below the 100-year flood elevation.

Please call with any questions or comments.

Sincerely,

Eric Morris, P.E.

Cc: Al Neyer, Inc.



APPROXIMATE SCALE

800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BUTLER COUNTY, OHIO

(UNINCORPORATED AREAS)

PANEL 50 OF 155

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

390037 0050 C

MAP REVISED:

JANUARY 21, 1998

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

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1*****************************************
 *  HEC-2 WATER SURFACE PROFILES           *
 *                                         *
 *  Version   4.6.2;  May 1991             *
 *                                         *
 *  RUN DATE    07APR98    TIME   12:59:39  *
 *****************************************
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 ***************************************
 *  U.S. ARMY CORPS OF ENGINEERS       *
 *  HYDROLOGIC ENGINEERING CENTER      *
 *  609 SECOND STREET, SUITE D         *
 *  DAVIS, CALIFORNIA 95616-4687       *
 *          (916) 756-1104             *
 ***************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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1
    07APR98      12:59:39                                                    PAGE     1


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 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 ************************************


 T1      Flood Insurance Study-Butler County, Ohio       (EMW-93-4106)
 T2      100-Year Flood
 T3      MILL CREEK

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0         4                                                          584.46

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1
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J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    115        200         38         66          1         52          4         53         21         22
     54

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10
  Starting WSL from MCSHARON.HC2 output
   Peak flow from MILL95.HC1 SR747D
   Current effective floodway will be maintained

QT       5       2467       4009       4465       6335       4465
NC    0.08       0.08       0.04        0.3        0.5
ET                                                          9.1       1000       1073       1000       1073
  Section modified by Crescent Park
  Section revised based on 9/93 Signco drainage plan by Neyer
  and 2/26/94 bridge survey
X1     14.2         17       1000       1073        100      100.0      100.0
X3       10                                                                  585.5      586.4
GR      586        350        585        795        585        900        584        950        583        970
GR    581.8       1000      575.4       1022        572       1027      569.7       1030      569.7     1030.1
GR      570     1031.4        570     1031.5        572       1050      577.5       1073      582.9      1105.
GR      582       1680        586       1740

ET                                                          9.1        970       1120        970       1120
   CRESCENTVILLE ROAD BRIDGE
   Top of Road 585.6, low chord 584.5
   Bridge area west of west pier ineffective flow
SB     1.00       1.56       2.80       0.00       19.0       2.00        657       1.91        570        570
1
   07APR98      12:59:39                                                                                PAGE    2


X1     14.3                                          32.0       32.0       32.0
X2                              1      584.5      585.6
X3       10                                                                  585.6      586.4
BT       -6        350        586                   795      585.6                  1000      585.6
BT                1073      586.4                  1340        588                  1540        590

NH        7        1.0       1710       0.06       1988       0.13       2000       0.04       2067       0.13
NH     2100       0.08       2200        1.0       2630
  Butler County Section A
  Section 14.4 2/26/94 survey section u/s of Crescentville Rd
  ET field 9 and 10 original FIS floodway, field 7, 8 optimized floodway
ET                                                          9.1       1800       2200       1800       2400
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X1     14.4         18       2000       2067        120        120        120
GR      588        750      585.8        925      585.1       1050      581.8       1150      583.2       1200
GR    581.4       1710      579.2       1988      580.8       2000        572       2001      570.9       2002
GR    570.2       2030      573.2       2032      577.6       2040      579.7       2067        582       2100
GR      582       2200        582       2590        589       2630

NC     0.08       0.12       0.04        0.1        0.3
NH        7        1.0        713       0.06        984       0.13       1000       0.04       1050       0.13
NH     1076       0.12       1131        1.0       1757
  Butler County Section B
  Section 15.0  4/94 survey section CM-1
ET                                                              9.1        770       1130        770       1130
X1     15.0         40       1000       1050        800        800        840
GR   588.80        192     586.99        196     584.53        203     584.05        240     583.89        331
GR   583.14        437     582.85        505     581.98        713     582.00        814     582.66        930
GR   581.96        971     581.11        976     581.99        984     582.22        994     580.75       1000
GR   573.51       1002     571.58       1003     570.18       1006      570.6       1011     571.97       1017
GR   572.68       1022     573.55       1025     575.49       1028     579.35       1034     579.03       1040
GR   579.26       1045     580.52       1050      582.5       1060     581.39       1067     582.06       1070
GR   583.19       1076     583.19       1082     582.52       1086     583.21       1098     584.53       1131
GR   586.15       1271     585.83       1364     586.09       1462     587.62       1611     588.48       1757

NH        5        1.0       1090       0.06       1530       0.13       1543       0.04       1610       0.13
NH     1770
  Butler County Section C, old section D
  Original HEC-2 data with both floodplains modified using 1980 topo
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 2+50
ET                                                              9.1       1200       1610       1090       1610
X1     16.0         17       1543       1610        680        630        650
GR    587.5        500        585        540        584        750       584.5       1000       584.3       1090
GR    584.0       1190        583       1380        582       1530        580       1543        577       1550
GR    573.2       1559      573.2       1572        583       1597        585       1610        590       1660
GR      595       1678      595.3       1770

NH        5        1.0       1625       0.06       2730       0.13       2748       0.04       2822       0.13
NH     3001
  Butler County Section D, old section E
  Section E is modified to exclude East Fork Mill Creek
  Section extended 1000' to the north (left bank)
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 3+50
1
   07APR98      12:59:39                                                                                  PAGE     3


ET                                                              9.1       2400       2822       2260       2822
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X1     17.1        16       2748       2822        150        100        100
GR     0592         0        590        230        588        550        588       1070        586       1476
GR      584      1625        584       2400        582       2730        582       2748      573.7       2764
GR    573.7      2797        586       2822        590       2832        594       2850      595.6       3000
GR    595.8      3001

NC     0.10       0.12      0.055        0.3        0.5
  Section taken off Windisch Road bridge plan 3/84
  Sheet 18/34, "Channel Sections, Mill Creek" Station 5+00
ET                                                          10.4       2400       2822       2160       3100
X1     17.2         20       3000     3118.6        300        130        140      0.843         0.
X3       10                                                                      584.5      592.0
GR    592.0        330      590.0        760        589       1000      587.8       1330      585.5       1885
GR     584        2227      583.8       2327      583.6       2427      583.4       2527      583.2       2627
GR    583.0       2727      582.5       2877      581.5       2927      581.5       2977        582       3000
GR    573.6     3026.9      573.6     3082.7        590     3118.6      593.5     3168.6      594.8     3218.6
  Windisch Road (BUT-CR 127-0.40)
  Bridge data obtained from Butler County Bridge Plan Project BRZ-0905(1), 1984.
  Top of Road 592, Low chord 589
  1959 highwater mark from COE report 585.5 approximatly

ET                                                          10.4       2600       2680       2160       3100
SB     1.25        1.5        2.0          0         45          2        976          2      573.6      573.6
NC                                       0.3        0.5
X1     17.3         20       3000     3118.6         34         34         34      0.843
X2                               1      587.8      584.5                                              0.843
X3       10                                                                      584.5        592
BT      -20        330        592                   760        590                1000        589
BT                1330        588                  1885        586                2227      585.2
BT                2327      585.1                  2427        585                2527        585
BT                2627      584.8                  2727      584.5                2877      585.2
BT                2927      586.1                  2977      587.2                3000      587.9
BT              3026.9      588.7                3082.7       590.4                3118.6     592.0
BT              3168.6      593.5                3218.6       594.8
GR    592.0        330      590.0        760        589       1000      587.8       1330      585.5       1885
GR     584        2227      583.8       2327      583.6       2427      583.4       2527      583.2       2627
GR    583.0       2727      582.5       2877      581.5       2927      581.5       2977        582       3000
GR    573.6     3026.9      573.6     3082.7        590     3118.6      593.5     3168.6      594.8     3218.6

NH        4        1.0       2510       0.06       3013       0.04       3059       0.13       3126
  left bank elevation was changed from 588 to 583
  Cross Section revised using Butler County bridge plans for Windisch Road,
  Channel Station 7+00, and Butler County 1980 Topos (1-26-94).
  Section E
ET                                                           9.1       2700       3094       2050       3090
X1     17.4         12       3000       3094        150        210        183
GR      592        430        590        590        588       1470        586       1993        584       2510
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GR      583       2864      581.8      2910      580.0      3000      573.8      3013      573.8      3059
GR    591.5       3094        600      3126
1
    07APR98      12:59:39                                                                          PAGE    4


NC                                       0.1        0.3
NH        5        1.0       2690       0.06       3220       0.13       3295       0.04       3358       0.13
NH     3500
  Butler County Section F
  Change left bank from 1500 to 3295 (1-26-94).
  Change left overbank elevations based on Butler County 1980 Topo.
ET                                                                    9.1       3020       3358       2560       3358
X1      18.1         16       3295       3358        290        380        390
GR       590        415        586        435        584        580        584       1010        586       1625
GR       586       2125        584       2690      583.5       3130      582.5       3220        580       3295
GR     575.4       3308      575.4       3328        580       3340        585       3358        590       3469
GR       595       3500

NC      0.13      0.130       0.05        0.5        0.8
  Change the bank elevations and left overbank elevations based on
  Butler County topo, extend left bank 1000' to the north.
ET                                                                   10.4       1833       2377       2660       3264
X1      18.2         19       2900       3264        950        200        280       0.67
X3        10                                                                    592.3      607.1
GR       590        300        584        400        584       1000        585       2360        585       2490
GR     584.9       2670      584.5       2800        584       2900        584       3000      582.8       3094
GR     576.4       3106      576.1       3119      576.4       3132      584.1       3140      584.8       3154
GR       590       3264        610       3325        611       3364      613.5       3464
  Interstate 75
  Top of Road 612.9, Low steel 601.8
  1959 highwater mark from COE report 586.5 approximatly
  Bridge model use original FIS data

ET                                                                  10.41       2042       2246       2660       3264
SB        0.9        1.5        2.5          0         28          6       3207        4.0
X1      18.3          0          0          0        390        410        410
X2         0          0          1      601.8      592.3                                 0.67
X3        10                                                                    592.3      613.1
BT       -12        300      593.5        590        400        593        584       1000      592.3        584
BT                 2360      596.5        585       2490        597        585       2670        600      584.9
BT                 2800        603      584.5       2900      605.3        584       3000      607.8      601.8
BT                 3264      613.1      607.1       3364      614.2        611       3464      615.7      613.5
  Butler County old section G
  bank location changed
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ET                                                          9.1       3162       3395       3162       3395
NC      0.12       0.08       0.04
X1      18.4         16       3190       3240         10     230        230
GR     597.5       3100      597.4       3120        595    3135      592.5       3142        590       3155
GR       585       3172        582       3190        580    3208        576       3214        576       3235
GR       580       3238        582       3240        585    3325        590       3450        595       3548
GR       600       3620
1
    07APR98      12:59:39                                                                              PAGE     5


NC      1.0        0.08      0.045        0.1         0.3
  Butler County Section G , old section H
  Channel bottom too low compared with 1980 topo
  Left bank changed from 2100 to 2290, X3 card removed
  right bank changed based on 1980 topo
ET                                                          9.1       2290       2630       1900       3400
X1      19.0         24       2290       2360          30    1410      1522
GR       600          0        590        920         588    1520       586       1620        585       2171
GR     584.9       2240        585       2283       585.1    2290       585       2302        580       2312
GR     576.9       2320      576.9       2338         580    2345       585       2360      585.7       2375
GR       586       2450      584.3       2550         586    2615       588       2740        590       2800
GR       590       2970        589       3000       588.8    3700       590       3850
  Butler County Section H, old section I
  Channel Bottom too low compared to 1980 topo
  Left bank changed from 1802 to 1799
  Right bank changed from 1868 to 1855
  Floodplain elevations revised based on 1980 topo and Butler County
  and the Butler County 1985 Interactive Graphic Study map

ET                                                          9.1       1440       1930       1000       2570
NC      0.1        0.08      0.045        0.1         0.3
X1      20.1         25       1799       1855         940     700       870
GR       592         620        590        660         586     710       584       1100        585       1780
GR     585.5       1790        585       1799         580    1802     577.4       1812      577.4       1833
GR       580       1837        585       1855       585.2    1860       585       1868        586       1970
GR     584.2       2000        586       2168         588    2190       590       2211        590       2305
GR     588.8       2871        590       3145         592    3265       594       3295        595       3310

NC      0.06       0.06      0.045        0.3         0.5
  Section 20.2 from Butler County Mulhauser bridge plan sheet 20/75
ET                                                          9.1                                 1300       2640
X1      20.2         23       2000       2102        1050    1050      1050
X3        10                                                                    593.25      593.25
GR       594         620        590        820         586     965     582.5       1458      582.8       1600
GR     583.7       1800      583.8       1900         585    1999     593.3       2000        578       2033
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GR      578     2033.1       578     2033.9       578       2034       578       2067       578      2067.1
GR      578     2067.9       578       2068     593.3       2102       589       2103       585        2157
GR    584.8       2477     584.8       2700       594       3200
  Section 20.3  Mulhauser Road extension
  As of 11/94, the Mulhaser Road bridge was not in place, but the fills were
  completed. Two tests were run, one with the fill but on bridge, one with
  brige and fills. The WSLs are identical. Therefore, although, the bridge
  was not in place, the HEC-2 model will include the bridge
  Top of Road 595, LC 593.3

ET                                                                 9.1       2000       2102       1300       2640
SB     1.05        1.5        2.5          0      30.76         2      910.9          2        578        578
NC                            0.03
X1     20.3                                          32         32         32
X2                               1      593.3        595
X3       10                                                                            595        595
BT      -23         620        595        594        820        595        590        965        595        586
BT                 1458        595      582.5       1600        595      582.8       1800        595      583.7
1
    07APR98      12:59:39                                                                                PAGE     6


BT                 1900        595      583.8       1999        595        585       2000        595      593.3
BT                 2033        595      593.3     2033.1        595        578     2033.9        595        578
BT                 2034        595      593.3       2067        595      593.3     2067.1        595        578
BT                2067.9       595        578       2068        595      593.3       2102        595      593.3
BT                 2103        595        589       2157        595        585       2477        603      584.8
BT                 2700        607      584.8       3200        610        594

NH        7        0.15       1426       0.06       1980       0.13       2000       0.04       2040       0.12
NH     2074        0.08       2780        0.2       2900
  Section 20.4 from Mauhaser Road existing profile and Butler
  County Interactive Graphics Study
  Section I
ET                                                                 9.1       1700       2400       1280       2580
X1     20.4          21       2000       2040        348        348        348
GR      592         800        590        890        588        940        586       1100      582.8       1426
GR    583.2        1700       584.       1900        585       1980      584.8       2000      578.1       2009
GR    578.5        2031      585.8       2040        589       2074        585       2127      584.4       2280
GR    584.1        2400        585       2526        586       2710        588       2750        590       2780
GR      592        2900

NC                                          0.1        0.3
NH        5         1.0       2375       0.06       2825      0.045       2882       0.06       3295        1.0
NH     3560
  Between Sections J to N, only changes made to original HEC-2 data
  are change bank stations, remove X3 cards and use NH card to model ineffective
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  area. Channel flow lines in the orignal model are lower than the Butler County
  topographic maps
  Butler County Section J
ET                                                          9.1       2400       2940       1620       3140
X1     21.0        27      2825      2882      1265       1275       1270
GR      595       835     592.5       950       590       1150      587.5       1330        585       1485
GR      583      1790       585      2050     587.5       2250        590       2375        590       2500
GR    587.5      2540       585      2566     585.4       2680        585       2732        585       2825
GR      580      2842     578.9      2851     578.9       2868        580       2873        585       2882
GR      586      3150       590      3255       590       3295      587.5       3310        585       3470
GR      590      3485       595      3560

NH        5       1.0      2140      0.06      2673      0.045       2748       0.06       2982        1.0
NH     3455
  Butler County Section K
  Original FIS section 20.5
ET                                                          9.1       1765       2970       1200       2860
X1     22.0        29      2673      2748       490        515        490
GR      595       475     592.5       630       590        790      587.5       1005        587       1220
GR    587.5      1540       590      1585     592.5       1670        595       2040        596       2140
GR      595      2280     592.5      2460       590       2508        585       2673        580       2692
GR    579.2      2700     579.2      2714       580       2720        585       2730      587.5       2748
GR    587.5      2768       586      2840       590       2970        590       2982      587.5       3005
GR    587.5      3290       590      3302       595       3378        600       3455
1
   07APR98      12:59:39                                                                         PAGE     7
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NH        5       1.0      2500      0.06      2632      0.045       2715       0.06       2840        1.0
NH     3465
  Butler County Section L
  Original FIS section 20.58
  Section 23.0, 24.0 and 25.0, right over banks do not agree well with
  Butler County 2' topo, no changes are made to the original HEC-2 model data
  except move the bank stations
ET                                                          9.1       1600       2853       1160       2900
X1     23.0        24      2632      2715       300        475        400
GR      595       131     592.5       395       590        590      587.5       1100        587       1283
GR      590      1460     592.5      1610       595       1830        598       2500        595       2621
GR      590      2632       585      2648       580       2655      579.4       2663      579.4       2675
GR      580      2682       585      2688     587.5       2715        590       2812        590       2840
GR    587.5      2853     587.5      3355       590       3370        595       3465

NH        5       1.0      1970      0.06      2555      0.045       2660       0.06       3190        1.0
NH     4520
  Butler County Section M
```

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  FIS station 20.71
ET                                                    9.1                          1740       3020
X1     24.0         23       2555       2660       460       840       740
GR      595        355      592.5        610       590      1150       589       1330       590       1510
GR      592       1970        590       2200       590      2285     587.5       2330     587.5       2555
GR      585       2595        580       2605     580.1      2615     580.1       2625       580       2634
GR      585       2647      587.5       2660       586      3000       590       3190       590       4265
GR      595       4325        595       4380     597.5      4520

NH        5        1.0       1600       0.06      2205     0.045      2302       0.06      3320        1.0
NH     3912
  FIS CROSS-SECTION N
  Original secton 20.83
ET                                                    9.1                          1805       2900
X1     25.0         49       2205       2293       430       850       660
GR    597.5          0        595        150       592       440       591        900       591       1200
GR    592.5       1500      592.5       1600     590.0      1625     587.5       1679     586.0       1735
GR    588.0       2145      590.0       2187     592.0      2198     594.0       2200     594.0       2205
GR    592.0       2210      590.0       2220     588.0      2230     586.0       2238     584.0       2245
GR    580.8       2252      580.8       2262     584.0      2276     586.0       2282     588.0       2287
GR    590.0       2293      591.9       2302     590.0      2315     588.0       2408     587.1       2523
GR    586.0       2811      586.4       3095     586.4      3155     588.0       3298     590.0       3310
GR    592.0       3320      593.6       3333     593.6      3339     592.0       3347     590.0       3352
GR    588.0       3360      587.8       3410     588.0      3460     590.0       3648     590.0       3672
GR    592.0       3789      594.0       3861     596.0      3880     598.0       3912

NH        6       0.06        945       0.12      1010     0.040      1075       0.12      1098       0.06
NH     2270        1.0       2815
   Added section, section coded from Union Township 1980 topographic map
   and Butler County interactive map
   Section 21.06 (old section O) deleted, this section will be section O
ET                                                    9.1                           580       1900
1
   07APR98      12:59:39                                                                    PAGE    8


X1     26.1         35       1000       1080       700       700       700
GR      594        200        592        230       590       280       588        360       588        945
GR      590        978        594       1000       590      1010       584       1028     582.5       1030
GR    582.5       1050        584       1054       590      1075       592       1080       592       1091
GR      590       1098      588.7       1200       588      1260     587.9       1470       587       1480
GR      590       1485        590       1495       588      1508     586.2       1650     586.1       2200
GR      588       2270        590       2280       592      2300       592       2325       590       2340
GR      588       2360        588       2470       590      2560       592       2740       594       2815

NC                                  .3        .5
NH        6       0.06        945       0.12      1010     0.040      1075       0.12      1098       0.06
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NH     2270        1.0       2815
ET                                                    9.1                             580        1900
X1    26.11                                 350       225        320                  0.35

NH        6      0.080        850      0.120        863     0.040        917     0.120        922      0.080
NH     1870        1.0       2650
  Rialto Road downstream face
ET                                                    9.1                             850        1910
X1     26.2         31        850        917        350       225        320         0          0          0
X3       10          0          0          0          0         0          0     594.1      592.3
GR    598.0          0      590.0        100      588.0       200        588       650      590.0        750
GR    591.8        850      590.9        863      588.5       877      586.6       880      585.4        891
GR    583.9        892      583.2        900      583.9       907      590.4     907.1      590.4        917
GR    592.0        922      594.0        992        590      1185      588.5      1200        588       1470
GR      587       1650        587       1690        590      1700        590      1740        588       1870
GR      588       2280        590       2370        592      2400        592      2470        594       2520
GR      596       2650

NH        6      0.080        850      0.120        891     0.035      907.1     0.100        992      0.080
NH     1700        1.0       2650
  UPSTREAM FACE, Rialto Road
  Top of Road 595.5, LS 594.1
  1959 highwater from COE report 593 approximately
  Beyond station 1470, CG*E dike prevent effective flows
ET                                                    9.1                             850        1910
SB    1.050        1.5        2.6          0         15       0.1        402       2.6     584.10     584.10
X1    26.30          0          0          0         26        26         26
X2        0          0          1      594.1      593.0         0          0         0          0          0
X3       10          0          0          0          0         0          0     595.5      593.0
BT      -24          0      600.0      598.0        100       598      590.0       200        596        588
BT                 650        596        588        750     595.6      590.0       850      595.5      591.8
BT                 850      595.5      594.1        917     595.6      594.1       917      595.6      590.4
BT                 922        595        592        992     594.0      594.0      1185      593.1        590
BT                1200        593      588.5       1470       597        588      1650        597        587
BT                1690        597        587       1700       597        590      1740        597        590
BT                1870        597        588       2280       597        588      2370        597        590
BT                2400        597        592       2520       596        594      2650        596        596
  Original FIS CROSS-SECTION P
  Section includes CG&E dike, Woolpert study 4/93
  left bank ineffective due to Rialto Road embankment
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ET                                                    9.1                             440        1560
NH        5        1.0        610       0.10        649     0.040        672      0.10        702       0.06
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NH     2096        1.0
X1    26.31         29        624         688          50          50          50           0           0           0
GR    600.0         20      598.0         142       596.0         184       594.0         230       592.0         330
GR    590.0        375      589.4         480       590.0         610       592.0         618       593.0         624
GR    592.0        630      590.0         640       588.0         643       586.0         646       584.0         649
GR    582.9        652      582.9         669       584.0         672       586.0         674       588.0         679
GR    590.0        687      592.0         688       592.0         702       590.0         710       589.7         901
GR    589.7       1132      589.7      1141.3      597.00        1155      595.17        2096

NH        5       0.06        819       0.100         858       0.040         889       0.100         919       0.060
NH     2093
  NEW CROSS-SECTION ACROSS CG&E SUBSTATION
  From Woolpert, section 21.2
  New section P
ET                                                    9.1                                   540        1600
X1     26.4         24        835         902         470         435         485
GR    600.0        100      598.0         332       596.0         394       594.0         423       592.0         450
GR    590.0        525      589.5         650       590.0         819       592.0         829       594.0         835
GR    592.0        845      590.0         853       584.0         858       583.5         862       583.5         887
GR    584.0        889      590.0         898       592.0         902       592.0         910       590.0         919
GR    589.1       1050      589.1      1164.8       595.2        1180       595.2        2093

NC                                         0.1         0.3
NH        6       0.06        950       0.100         987      0.0400        1013       0.100        1041        0.06
NH     1900        1.0       2048
  FIS CROSS-SECTION Q
ET                                                    9.1                                   500        1560
X1     27.0         36        965        1029        1020         965         962           0           0           0
GR    600.0        100      598.0         142       596.0         170       594.0         215       592.0         352
GR    591.4        400      592.0         495       592.0         950       594.0         957       594.0         965
GR    592.0        970      590.0         975       588.0         979       586.0         987       585.0         993
GR    585.0       1000      586.0        1013       588.0        1021       590.0        1026       594.0        1029
GR    594.0       1038      592.0        1041       590.0        1047       589.4        1293       588.8        1558
GR    588.8       1890      590.0        1900       592.0        1911       594.0        1921       595.3        1931
GR    595.3       1937      594.0        1943       594.0        1965       596.0        2000       598.0        2022
GR    600.0       2048

NH        6       0.06        505       0.100         543       0.040         572       0.100         592        0.06
NH      745        1.0       1411
  FIS CROSS-SECTION R
  Area south of RR not effective
  set right bank to 745
ET                                                    9.1                                   320         700
X1     28.0         38        523         719        1612        1635        1633           0           0           0
X3       10                                                                              592         597
GR    600.0        100      598.0         112       596.0         129       594.0         153       592.0         189
GR    591.8        240      592.0         295       594.0         497       596.0         505       596.0         523
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GR    594.0       533      592.0       540      590.0       543      586.0       551      586.6       563
GR    590.0       572      596.0       580      596.0       585      594.0       590      592.0       592
GR    591.0       640      592.0       694      592.0       709      592.0       719      594.0       723
GR    596.0       731      597.8       739      597.8       745      596.0       758      594.0       765
1
   07APR98      12:59:39                                                                    PAGE   10

GR    592.0       775      590.0       781      590.0       805      590.4       841      590.0       891
GR    590.0      1276      595.0      1371      600.0      1411

NH        5      0.06        980     0.100       1013     0.035       1044     0.100       1098       1.0
NH     1842
  FIS CROSS-SECTION S
  Area south of RR not effective
  use x3 card for storage calculation purpose
ET                                                          9.1                              440       1080
X1     29.1        39        996      1083       1295      1300       1300          0          0          0
X3       10                                                                      594        599
GR    600.0       100      598.0       113      596.0       138      594.0       185      594.0       290
GR    594.0       387      593.6       476      594.0       639      594.0       692      594.0       715
GR    596.0       980      598.0       989      598.0       996      596.0      1001      594.0      1004
GR    592.0      1009      590.0      1013      586.8      1026      586.8      1033      590.0      1044
GR    592.0      1051      594.0      1060      596.0      1065      598.0      1073      599.0      1083
GR    599.0      1089      598.0      1098      596.0      1101      594.0      1105      592.0      1114
GR    590.3      1127      592.0      1142      592.0      1165      592.0      1230      593.2      1522
GR    594.0      1769      596.0      1820      598.0      1830      600.0      1842

NC     0.06       1.0     0.035        0.3        0.5
  Butler County Section T replaced by relocated 747 bridge downstream section.
  Cross section and bridge data taken from Butler County bridge plans for
  State Route 747 (BUT-747-2.12, Feb. 1993). (sheets 14-18/50)
ET                                                          9.1                             1480       2085
X1     29.2        23      2000     2084.5       1300       950       1115      0.872
X3       10                                                                      598.8     600.20
GR      604       185      599.9       966      599.0      1216       597.6      1266      596.9      1366
GR    595.9      1466      595.6      1666      595.3      1766       596.7      1866      595.8      1966
GR    596.3      2000      588.8      2015      588.8    2069.5       596.3    2084.5      599.5      2119
GR    593.4      2166      594.1      2266      593.9      2366       594.2      2566      595.2      2966
GR    596.5      3166      602.2      3216      605.0      3280

NC                          0.03
  SR 747 built in 1994
  TOR 600.2 LS=598.5
ET                                                          9.1                             1480       2085
SB     1.05       1.5        2.8                  54.5         2       654.5       1.5     589.50      589.5
X1     29.3        23      2000     2084.5         80        80          80      0.872
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X2                          1      598.5       600.1                                    0.872
X3       10                                                                 600.1       600.2
BT      -23        185        604                966       600.1                1216       600.1
BT                1266      600.1                1366       600.2                1466       600.3
BT                1666      600.4                1766       600.5                1866       600.5
BT                1966      600.2                2000       600.2                2015       600.2
BT              2069.5      600.2              2084.5       600.2                2119       600.2
BT                2166      600.2                2266       600.5                2366       600.9
BT                2566      601.8                2966       602.9                3166       603.3
BT                3216      603.8                3280       605.0
GR       604        185      599.9         966    599.0        1216      597.6       1266      596.9        1366
GR     595.9       1466      595.6        1666    595.3        1766      596.7       1866      595.8        1966
GR     596.3       2000      588.8        2015    588.8      2069.5      596.3     2084.5      599.5        2119
GR     593.4       2166      594.1        2266    593.9        2366      594.2       2566      595.2        2966
GR     596.5       3166      602.2        3216    605.0        3280
1
    07APR98      12:59:39                                                                                PAGE   11


  Between Section 22.21 to 23.41, very little change was made to the original
  data for the Butler County FIS, NH cards were used for uneffective area
  sections 22.98 and 23.08 were extented on the left bank using USGS topo
  1959 highwater from COE report 598 approximately

NH        5       0.06       1700       0.06       2085       0.035       2128       0.10       2150       0.25
NH     3175
  Butler County Section U
  Original section 22.21
  Use X3 card to prevent flow over RR track unless overtopped
ET                                                              9.1                               1500       2150
X1     29.4         18       2085       2150        200        230        230
X3       10
GR      605        370        600        420        600        490      597.5       1250      597.5        1700
GR    597.5       2000      597.4       2070        595       2085        590       2095      589.6        2100
GR    589.6       2112        590       2118        595       2128        601       2150        595        2252
GR    597.5       2282        600       3150      604.5       3175

NH        4       0.06       1766      0.040       1823        0.1       1842       0.25       2818
  Butler County Section V
  Peak discharges from MILL.HC1 Tyler
QT        5       1513       2396       2706       3723       2706
ET                                                              9.1                               1200       1842
X1     30.0         19       1766       1842        875        900        900
X3       10
GR      601        280        600        500      597.5       1200        597       1416        595        1766
GR      590       1776      589.6       1784      589.6       1792        590       1798        595        1810
GR      600       1823        602       1842        595       1880        595       2300      597.5        2685
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GR      600       2720      602.5       2770        605       2810        610       2818
NC                                        0.1         0.3
NH        4       0.06       2422      0.042        2488       0.10        2496       0.25       3660
  Butler County Section W
ET                                                                9.1                              1800       2488
X1     31.0         20       2422       2488         512        512         512
X3       10
GR    602.5        300        600        500       597.5       2195         595       2422        590       2435
GR    589.8       2444      589.8       2452         590       2459         595       2467        600       2473
GR      602       2488        600       2496         595       2530         595       2860      597.5       3180
GR    597.5       3410        600       3440       602.5       3510         605       3545      607.5       3660

NH        4       0.06       3380      0.045        3450       0.10        3460       0.25       4900
  Butler County Section X
ET                                                                9.1                              2541       3450
X1     32.0         26       3380       3450        1550       1550        1550
X3       10
GR      610        300        605        680       602.5       1110         600       1500        598       1940
GR    597.5       2432        598       3352         598       3362       597.5       3372      597.5       3380
GR      595       3383        590       3392       589.9       3400       589.9       3412        590       3420
GR      595       3430        600       3438       603.2       3450         600       3460        595       3472
GR      595       4185      597.5       4375         600       4400       602.5       4580        605       4720
GR      610       4900
1
   07APR98      12:59:39                                                                                  PAGE   12


NH        4       0.06       3338      0.043        3385       0.12        3392       0.25       4990
  Butler County Section Y
ET                                                                9.1                              3229       3392
X1     33.0         21       3338       3392        1450       1090        1120
X3       10
GR      610          0        605        100         603        400       602.5       1920        600       2920
GR    597.5       3221        595       3338         590       3345         590       3365        595       3375
GR      600       3385        605       3392       605.4       3400         605       3402        600       3415
GR      596       3970        600       4355       602.5       4445         605       4680      607.5       4750
GR      610       4990

NH        4       0.06       3250      0.045        3320       0.12        3332       0.25       4850
  Butler County Section Z
ET                                                                9.1                              3250       3332
X1     34.0         27       3250       3332         450        530         540
X3       10
GR      610          0        606        140         603        400       602.5       2060        600       3020
GR      600       3250        595       3262       591.3       3268       591.3       3283        595       3292
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GR      600       3320       605       3332       605       3348       600       3363       595       3395
GR      595       3750     597.5       4065       600       4095       601       4210       605       4295
GR      605       4311       600       4320       600       4338     602.5       4370     602.5       4550
GR      605       4730     607.5       4850

NH        4       0.06       1910      0.045       1943      0.12       1958      0.25       3780
  Butler County Section AA
ET                                                            9.1                            1430       1958
X1     35.0         20       1910       1958        600       620        575
X3       10
GR      605          0        600       1260        600      1895        600      1910        595       1918
GR    592.4       1925      592.4       1938        595      1943        600      1950        605       1958
GR      605       1972        600       1988        595      2021        595      2655      597.5       2718
GR      600       2745        600       3002        605      3030      607.5      3140        610       3780
  Butler County Section AB

NC     0.06       0.25      0.045
ET                                                            9.1                            1280       2219
X1     36.0         22       2182       2219       1112      1120       1120
X3       10
GR      610          0        605        100        600      1030        600      2115        600       2182
GR      595       2192      594.6       2201      594.6      2213        595      2218        605       2219
GR      600       2263      597.5       2303      597.5      2700        595      2740        595       2760
GR      597       3060      597.5       3330        600      3410        600      3560        605       3610
GR    607.5       3630        610       3980

NH        6        1.0       1500      0.060       3848      0.12       3895      0.040       3911      0.12
NH     3951      0.060       4300
   First Cross Section of New Study
   Section surveyed 10/15/93
   Section AC
ET                                                            9.1                            2900       3911
1
   07APR98      12:59:39                                                                                PAGE   13


X1     37.0         25       3895       3911       2600      2600       2600
GR      610          0        605        500        600      1000        600      1500      601.2       2500
GR    600.9       2780      601.2       3130      600.7      3390      600.5      3500      600.6       3634
GR    600.8       3754      601.6       3848        608      3870     599.24      3891     597.79       3895
GR   597.44       3899     597.06       3907     597.52      3911      603.1      3919     607.69       3931
GR    602.9       3951     603.88       4009        603      4157        604      4260        610       4300

NH        4        1.0       1600       0.06       2000     0.045       2049       0.10       2250
    Survey section 53'd/s of Seaward Road, moved downstream , lower .79'
    Section AD
ET                                                            9.1                            1900       2049
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X1      38.1        13       2000       2049        900         900         900
GR       610       150        605        600        604        1600         603       1860         603       1970
GR    608.94      1985     605.14       2000     597.64        2011      597.44       2015      598.04       2019
GR    602.74      2034     606.34       2049     606.84        2064         610       2250

NC      0.08      0.08      0.045        0.5        0.8
    SEWARD ROAD BRIDGE (Special BRIDGE ROUTINE)
    Bridge and channel section from Site Plan, Seward Road bridge No. 02.55
    dated 6/93, prepared by Lockwood, Jones & Beals
  TOR =610.6, LS=606.7
    Berm northeast of Seward elevation 609
ET                                                    10.4
X1      38.2        10       2000       2047        300         220         250
X3        10                                                                 607.7         610
GR       620       600        610        700        606        1690       606.7       2000         598       2015
GR       598      2031        607       2047        607        2090         610       2290         620       2780

ET                                                    10.4                                          2000       2047
SB       1.0       1.6        2.6                     16         0.1         306         2.0
X1      38.3                                          32          32          32
X2                            1.0      606.7        609
X3        10                                                                 609         610
BT       -10       600        620        620        700         610         610       1690       607.8        606
BT                2000     610.14      606.7       2015       610.2       606.8       2031       610.4        607
BT                2047     610.35        607       2090      610.96         607       2290      612.42        610
BT                2780        620        620

NH         5       1.0       1930       0.06       2000        0.04        2030       0.06       2075        1.0
NH      4900
    Survey section 1.6
    1959 highwater from COE report 608 approximately
    Section AE
ET                                                    9.1                                           1960       2223
X1      38.6        15       2000       2030         80          80          80
GR       620       600        610        700     606.73        1930      606.43       1950      603.93       2000
GR    598.23      2003     597.73       2014     598.23        2025      603.13       2030      605.83       2042
GR    609.73      2065      606.5       2075      606.5        4023         610       4600         620       4900
  leaving the contraction/expansion coeff
1
    07APR98      12:59:39                                                                                  PAGE    14


NH         5       1.0        700       0.06        994       0.045      1017.5       0.06        1400        1.0
NH      3400
    Survey section 1.7   10/14/93
    Section AF
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ET                                                    9.1                            894       1276
X1     39.0        18       994    1017.5       700       700       700
GR      615        30       610        80       608       300     607.8       700    607.82        890
GR   607.83       978     606.2       984    602.91       994    599.61      1000    599.61       1010
GR    604.5    1017.5    611.08      1030    606.68      1042     606.7      1120       608       1400
GR      608      3000       610      3200       620      3400

NH        5      0.06      1966      0.12      2020      0.04      2050      0.12      2136       0.06
NH     3300
ET                                                   10.4
X1     40.1        17      2000      2070       310       310       310
GR      620      1100       610      1200     608.3      1700     608.6      1800     608.6       1934
GR    608.5      1944     608.4      1966     606.7      2000     600.4      2020     599.5       2035
GR    600.4      2050     606.7      2070     608.4      2104     613.5      2126       609       2136
GR      610      2300       620      3300

NC                                0.3       0.5
NH        5      0.06      1966      0.12    2019.2     0.040    2050.7      0.12      2126       0.10
NH     3200
   PRIVATE DRIVE BRIDGE (NORMAL BRIDGE ROUTINE)
 TOR =612.2 LS=609.4
X1     40.2        26    2019.2    2050.7       100       100       100
X3       10                                                                 608       610
GR      620      1140     608.3      1500     609.1      1860     608.5      1944     608.4       1966
GR    606.7      2000     600.7    2019.2     600.4    2021.6     599.6      2024     599.4     2026.5
GR    599.4    2028.9     599.6    2031.3     599.7    2033.7     599.7      2035     599.7    2036.25
GR    599.4    2038.6     599.7    2041.1     600.7    2043.5     601.6    2045.9     602.6     2048.3
GR   603.45    2050.7     606.7      2070       610      2104     613.5      2126       610       2136
GR      620      3200

NH        5      0.06      1966      0.12    2019.2     0.040    2050.7      0.12      2126       0.10
NH     3200
X1     40.3                                       1         1         1
X3       10                                                                 608       610
BT      -26      1140       620       620      1500     608.3     608.3      1860     609.1      609.1
BT               1944       610       610      1966       610       610      2000       610        610
BT             2019.2     612.2    605.45    2021.6     612.2    607.55    2024.0     612.2     608.98
BT             2026.5     612.2     609.4    2028.9     612.2    608.98    2031.3     612.2     607.55
BT             2033.7     612.2     599.7      2035     612.2     599.7   2036.25     612.2      599.7
BT             2038.6     612.2    607.55    2041.1     612.2    608.98    2043.5     612.2      609.4
BT             2045.9     612.2    608.98    2048.3     612.2    607.55    2050.7     612.2     605.45
BT               2070       610       610      2104       610       610      2126     613.5      613.5
BT               2136       610       610      3200       620       620
1
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NH        5       0.06       1966       0.12       2019.2      0.040      2050.7      0.12       2126       0.10
NH     3200
X1     40.4                                          12          12         12
X2                                                                          1
X3       10                                                                          608        610

NH        5       0.060      1966       0.12       2019.2      0.040      2050.7      0.12       2126       0.10
NH     3200
X1     40.5          26      2019.2     2050.7          1           1          1
GR      620        1140       608.3       1500       609.1        1860       608.4       1944       608.4       1966
GR    606.7        2000       600.7     2019.2       600.4      2021.6       599.6    2024.08       599.4     2026.5
GR    599.4      2028.9       599.6     2031.3       599.7      2033.7       599.7       2035       599.7    2036.25
GR    599.4      2038.6       599.7     2041.1       600.7      2043.5       601.6    2045.92       602.6    2048.34
GR   603.45      2050.7       606.7       2070       608.4        2104       613.5       2126         610       2136
GR      620        3200

NC                                        0.1        0.3
NH        5       0.08       1966         0.1       2020       0.040        2050       0.10       2126       0.10
NH     3100
ET                                                                9.1                               1925       2050
X1     40.6          13       2020       2050         70          70          70
GR      620        1000        610       1300        610        1944       608.4       1966       606.7       2000
GR    600.4        2020       599.5       2035       600.4        2050       606.7       2070       608.4       2104
GR    613.5        2126         610       2130        620        3100

NC     0.09        0.09      0.045
  Sruvey section 2.7
ET                                                               10.4
X1     41.0          12       1000       1075         640         640         640
GR      620          20        610        460       609.65        920       608.55       1000      606.25       1027
GR   600.65        1043     600.15       1048       600.55        1054       609.45       1075      609.65       1175
GR      610        1510        620       2020
    Section AG
  Survey section 2.8

ET                                                               5.4                               900        1064
X1     42.0          12       1000       1037         810         740         800                    2.0
GR      620          70     611.25        910       612.25        1000       609.05       1007      601.95       1012
GR   602.25        1015     602.25       1020       607.85        1037       611.95       1084        610       1200
GR      610        1400        620       1960

NC                                        0.3        0.5
  Survey section 3.1
ET                                                                9.1                              1000        1105
X1     43.1           9       1000       1070         800         800         800
GR      620         820     615.9         942       614.7        1000       607.8        1013      607.1       1024
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GR    607.2       1030       613.6       1070       616.4       1092         620        1850
   Tylersville Road
   Elevations Taken From Butler County Cut & Fill Plan Dated 6-86
   TOR=622.8, LS=620.9
1
ET                                                                 10.4
X1     43.2         17       1000       1105        100         100          100
X3       10                                                                  620         620
GR    623.2        595       618.4       900        618.1       950          618.1       1000        609.9       1025
GR      607       1035        607       1045        607.2       1055         608.3       1075         617        1105
GR    615.7       1150       614.2       1250       613.8       1350         613.1       1450        614.9       1550
GR    617.4       1650        620        1700

NC                              0.035
ET                                                                 10.41
SB      0.9         1.6         2.6                    50          3.0         1108.3      1.92        607.0       607.0
X1     43.3                                              50          50           50
X2                                  1       620.9      622.4
X3       10                                                                    622.8        620
BT      -12         595        623.2                     900        623.2                    950        623.0
BT                 1000        622.8                    1105        622.4                   1150        622.1
BT                 1250        621.7                    1350        621.3                   1450        620.8
BT                 1550        620.4                    1650        620.1                   1700        620.0

NC     0.06        0.06        0.04
  Section 43.4 and 44.0 from Millers Run subdivision Grading Plan
   Sheet 7A/11 (Bayer-Becker Engineering)
   Section AH
ET                                                                 10.4
X1     43.4         16       1000       1124        200         200          200
GR      620        840        618        910        616         937          614         1000        612         1040
GR      610       1060        608       1066       607.5        1067        607.5        1080        608         1081
GR      610       1104        612       1114        614         1124         614         1220        616         1300
GR      618       1308

NC                                        0.1         0.3
  Section AI
X1     44.0         13       1000       1050        600         560          700
GR      620        580        616        772        614         890          614         1000        610         1014
GR      608       1015        608       1029        610         1030         612         1040        614         1050
GR      616       1064        618       1170        620         2060
   Section 45.0 from Schul Estates Section Six Plan (Bayer Becker Eng., 1"=50')
   July 13. 1988
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ET                                                        9.1                                 900       1142
X1     45.0        18      1000      1042       450       450       450
GR      621       485       618       525       621       577       621       795       618        962
GR      618       982       616       990       614       996       612      1000       610       1003
GR    609.5      1008     609.5      1036       610      1041       612      1042       614       1043
GR      616      1044       616      1128       620      1500
   Section 46.0 from Schul Estates Section Six plan, Section D
   Section AJ
1
   07APR98      12:59:39                                                                   PAGE   17


ET                                                        9.1                                 836       1047
X1     46.0        10      1000      1047       520       520       520
GR      620       605       620       635       621       680       618       700       618       1000
GR      610      1010       610      1030       616      1047       618      1054       620       1200

NC     0.08      0.08     0.045
   Cross Section 47.0  From Schul Estates Plat Plan (Bayer Becker Eng., 1"=100')
   Section AK
ET                                                        5.4
X1     47.0        11      1000      1127      1060      1060      1060
GR      628       625       626       682       624       725       622       747       620        765
GR      618      1000     613.3      1082     613.3      1105       618      1127       620       1145
GR      630      1212
   Section AL

X1     48.0        13      1000      1058      1040      1040      1040
GR      628       850       626       895       624       982       622       991       620       1000
GR      618      1006     617.5      1012     617.5      1040       618      1050       620       1058
GR      622      1068       624      1150       626      1266
   Cross Section From Schul Estates Grading Plan (Bayer Becker Eng., 1"=50')
   Section AM

X1     49.0        14      1012      1055       750       550       650
GR      630       976       628       982       626       989       624      1000       622       1012
GR    621.8      1024     621.3      1025     621.3      1046     621.8      1047       622       1055
GR      624      1065       626      1075       628      1085       630      1100
1
   07APR98      12:59:39                                                                   PAGE   18


T1     Flood Insurance Study EMW-93-C-4106
T2     Floodway Analysis
T3     Mill Creek              Butler County, Ohio
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J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	6							585.46	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2		-1							

1

THIS RUN EXECUTED 07APR98 12:59:40

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MILL CREEK

SUMMARY PRINTOUT

	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
	14.200	.00	584.46	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.200	.00	585.46	1.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.04	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.82	.78	103.00	970.00	1000.00	1073.00	1073.00
*	14.400	152.00	585.73	.00	1673.60	937.71	2000.00	2067.00	2611.31
*	14.400	152.00	586.33	.61	600.00	1800.00	2000.00	2067.00	2400.00
*	15.000	992.00	585.98	.00	1160.12	198.86	1000.00	1050.00	1421.81
*	15.000	992.00	586.59	.61	360.00	770.00	1000.00	1050.00	1130.00
	16.000	1642.00	586.50	.00	1109.08	515.95	1543.00	1610.00	1625.03
	16.000	1642.00	587.08	.58	520.00	1090.00	1543.00	1610.00	1610.00

*	17.100	1742.00	586.64	.00	1478.20	1345.41	2748.00	2822.00	2823.61
	17.100	1742.00	587.15	.51	562.00	2260.00	2748.00	2822.00	2822.00
	17.200	1882.00	586.70	.00	1278.96	1395.75	2580.81	2680.79	2674.71
	17.200	1882.00	587.23	.53	455.49	2220.19	2580.81	2680.79	2675.68
	17.300	1916.00	586.71	.00	1280.85	1393.88	2580.81	2680.79	2674.73
	17.300	1916.00	587.24	.53	456.88	2218.83	2580.81	2680.79	2675.70
	17.400	2099.00	586.82	.00	1306.29	1778.46	3000.00	3094.00	3084.75
	17.400	2099.00	587.39	.57	1035.88	2050.00	3000.00	3094.00	3085.88
	18.100	2489.00	586.95	.00	2971.05	430.25	3295.00	3358.00	3401.30
	18.100	2489.00	587.48	.53	798.00	2560.00	3295.00	3358.00	3358.00
*	18.200	2769.00	587.40	.00	207.06	2042.00	2042.00	2285.88	2249.06
*	18.200	2769.00	587.84	.43	213.22	2042.00	2042.00	2285.88	2255.22

1

	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
	18.300	3179.00	587.44	.00	207.67	2042.00	2042.00	2285.88	2249.67
	18.300	3179.00	587.87	.42	213.65	2042.00	2042.00	2285.88	2255.65
*	18.400	3409.00	588.06	.00	239.78	3161.61	3190.00	3240.00	3401.39
*	18.400	3409.00	588.36	.30	233.00	3162.00	3190.00	3240.00	3395.00
*	19.000	4931.00	589.88	.00	2703.19	955.14	2290.00	2360.00	3835.36
*	19.000	4931.00	590.06	.18	1500.00	1900.00	2290.00	2360.00	3400.00
*	20.100	5801.00	590.12	.00	2494.60	657.60	1799.00	1855.00	3152.20
*	20.100	5801.00	590.34	.21	1570.00	1000.00	1799.00	1855.00	2570.00
*	20.200	6851.00	590.12	.00	88.09	2006.85	2000.00	2102.00	2094.94
*	20.200	6851.00	590.40	.28	89.31	2006.25	2000.00	2102.00	2095.56
*	20.300	6883.00	590.16	.00	88.25	2006.77	2000.00	2102.00	2095.02
*	20.300	6883.00	590.44	.27	89.46	2006.18	2000.00	2102.00	2095.63
*	20.400	7231.00	590.90	.00	1984.88	849.34	2000.00	2040.00	2834.22
*	20.400	7231.00	591.14	.23	1300.00	1280.00	2000.00	2040.00	2580.00
*	21.000	8501.00	590.97	.00	2426.94	1072.58	2825.00	2882.00	3499.52

*	21.000	8501.00	591.21	.24	1520.00	1620.00	2825.00	2882.00	3140.00
*	22.000	8991.00	591.03	.00	1726.02	723.77	2673.00	2748.00	3317.73
*	22.000	8991.00	591.26	.23	803.82	1200.00	2673.00	2748.00	2860.00
*	23.000	9391.00	591.27	.00	1809.50	491.28	2632.00	2715.00	3394.05
*	23.000	9391.00	591.51	.24	661.72	1160.00	2632.00	2715.00	2900.00
*	24.000	10131.00	591.86	.00	3488.36	749.15	2555.00	2660.00	4287.27
*	24.000	10131.00	592.19	.33	1280.00	1740.00	2555.00	2660.00	3020.00
*	25.000	10791.00	591.92	.00	3048.37	474.90	2205.00	2293.00	3784.56
	25.000	10791.00	592.28	.36	1083.99	1805.00	2205.00	2293.00	2900.00
	26.100	11491.00	591.96	.00	2452.45	230.95	1000.00	1080.00	2736.59
	26.100	11491.00	592.36	.40	1306.94	580.00	1000.00	1080.00	1900.00
	26.110	11811.00	591.98	.00	2403.47	239.30	1000.00	1080.00	2706.50
	26.110	11811.00	592.39	.42	1304.35	580.00	1000.00	1080.00	1900.00
*	26.200	12131.00	592.32	.00	1487.72	850.00	850.00	917.00	2477.90
*	26.200	12131.00	592.44	.13	929.79	850.00	850.00	917.00	1910.00
*	26.300	12157.00	594.60	.00	1709.47	850.00	850.00	917.00	2559.47
*	26.300	12157.00	594.61	.00	1060.00	850.00	850.00	917.00	1910.00
*	26.310	12207.00	594.60	.00	934.37	216.13	624.00	688.00	1150.50
*	26.310	12207.00	594.61	.01	710.53	440.00	624.00	688.00	1150.53

1

	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
*	26.400	12692.00	594.79	.00	767.41	411.56	835.00	902.00	1178.98
	26.400	12692.00	594.81	.02	639.02	540.00	835.00	902.00	1179.02
*	27.000	13654.00	594.93	.00	1776.76	194.03	965.00	1029.00	1981.31
	27.000	13654.00	595.06	.12	1060.00	500.00	965.00	1029.00	1560.00
*	28.000	15287.00	595.20	.00	547.21	138.56	523.00	719.00	719.00
*	28.000	15287.00	595.72	.53	353.48	320.00	523.00	719.00	700.00
*	29.100	16587.00	597.18	.00	933.68	123.28	996.00	1083.00	1069.71
*	29.100	16587.00	598.10	.92	633.92	440.00	996.00	1083.00	1073.92

*	29.200	17702.00	598.29	.00	73.68	1767.68	1767.68	1841.36	1841.36
	29.200	17702.00	598.99	.70	361.36	1480.00	1767.68	1841.36	1841.36
	29.300	17782.00	598.57	.00	73.68	1767.68	1767.68	1841.36	1841.36
	29.300	17782.00	599.41	.84	73.68	1767.68	1767.68	1841.36	1841.36
	29.400	18012.00	599.79	.00	1591.42	554.14	2085.00	2150.00	2145.56
	29.400	18012.00	600.40	.61	647.78	1500.00	2085.00	2150.00	2147.78
*	30.000	18912.00	600.18	.00	1362.67	461.97	1766.00	1842.00	1824.64
*	30.000	18912.00	600.86	.68	631.16	1200.00	1766.00	1842.00	1831.16
	31.000	19424.00	600.27	.00	1996.22	478.77	2422.00	2488.00	2474.99
	31.000	19424.00	600.94	.67	680.04	1800.00	2422.00	2488.00	2480.04
	32.000	20974.00	600.48	.00	2014.88	1424.92	3380.00	3450.00	3439.80
	32.000	20974.00	601.19	.71	901.48	2541.00	3380.00	3450.00	3442.48
*	33.000	22094.00	600.70	.00	746.74	2639.24	3338.00	3392.00	3385.98
*	33.000	22094.00	601.47	.77	158.06	3229.00	3338.00	3392.00	3387.06
*	34.000	22634.00	601.14	.00	743.57	2579.19	3250.00	3332.00	3322.76
*	34.000	22634.00	601.99	.85	74.79	3250.00	3250.00	3332.00	3324.79
*	35.000	23209.00	602.22	.00	1250.65	702.89	1910.00	1958.00	1953.54
*	35.000	23209.00	603.22	1.00	525.15	1430.00	1910.00	1958.00	1955.15
*	36.000	24329.00	602.63	.00	1678.23	540.54	2182.00	2219.00	2218.76
*	36.000	24329.00	603.55	.92	938.85	1280.00	2182.00	2219.00	2218.85
	37.000	26929.00	603.04	.00	3213.33	696.08	3895.00	3911.00	4161.04
	37.000	26929.00	604.05	1.01	987.91	2900.00	3895.00	3911.00	3911.00
*	38.100	27829.00	604.60	.00	1015.34	999.66	2000.00	2049.00	2041.75
*	38.100	27829.00	605.13	.53	119.35	1900.00	2000.00	2049.00	2043.97
	38.200	28079.00	606.93	.00	46.88	2000.00	2000.00	2047.00	2046.88
*	38.200	28079.00	607.82	.89	47.00	2000.00	2000.00	2047.00	2047.00

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SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
38.300	28111.00	607.78	.00	47.00	2000.00	2000.00	2047.00	2047.00
38.300	28111.00	608.67	.89	47.00	2000.00	2000.00	2047.00	2047.00

*	38.600	28191.00	609.27	.00	3498.32	976.37	2000.00	2030.00	4478.87
*	38.600	28191.00	609.47	.20	260.71	1960.00	2000.00	2030.00	2223.00
	39.000	28891.00	609.97	.00	3109.88	82.63	994.00	1017.50	3197.61
*	39.000	28891.00	610.66	.69	380.05	894.00	994.00	1017.50	1276.00
*	40.100	29201.00	610.22	.00	1102.20	1197.85	2000.00	2070.00	2321.52
*	40.100	29201.00	610.98	.76	302.74	1767.26	2000.00	2070.00	2070.00
	40.200	29301.00	610.23	.00	690.12	1440.58	2019.20	2050.70	2160.59
	40.200	29301.00	611.00	.77	250.29	1800.41	2019.20	2050.70	2050.70
*	40.300	29302.00	610.38	.00	711.74	1436.04	2019.20	2050.70	2176.31
*	40.300	29302.00	611.22	.84	370.61	1680.09	2019.20	2050.70	2050.70
	40.400	29314.00	610.43	.00	719.10	1434.49	2019.20	2050.70	2181.67
	40.400	29314.00	611.28	.85	373.66	1677.04	2019.20	2050.70	2050.70
*	40.500	29315.00	610.39	.00	720.09	1435.57	2019.20	2050.70	2177.93
*	40.500	29315.00	611.23	.84	285.24	1765.46	2019.20	2050.70	2050.70
	40.600	29385.00	610.29	.00	848.98	1291.38	2020.00	2050.00	2157.89
	40.600	29385.00	611.16	.87	125.00	1925.00	2020.00	2050.00	2050.00
	41.000	30025.00	611.33	.00	1176.78	401.28	1000.00	1075.00	1578.06
	41.000	30025.00	612.29	.96	299.70	844.14	1000.00	1075.00	1143.84
*	42.000	30825.00	613.31	.00	436.90	904.29	1000.00	1037.00	1473.33
*	42.000	30825.00	613.45	.14	199.99	1001.74	1000.00	1037.00	1236.96
*	43.100	31625.00	616.86	.00	274.87	913.50	1000.00	1070.00	1188.37
*	43.100	31625.00	617.54	.69	105.00	1000.00	1000.00	1070.00	1105.00
	43.200	31725.00	617.21	.00	102.30	1002.70	1000.00	1105.00	1105.00
	43.200	31725.00	617.87	.65	104.29	1000.71	1000.00	1105.00	1105.00
	43.300	31775.00	617.22	.00	102.33	1002.67	1000.00	1105.00	1105.00
	43.300	31775.00	617.88	.65	104.31	1000.69	1000.00	1105.00	1105.00
	43.400	31975.00	617.53	.00	389.69	916.41	1000.00	1124.00	1306.10
	43.400	31975.00	618.06	.54	152.83	1000.00	1000.00	1124.00	1152.83
*	44.000	32675.00	617.83	.00	477.48	683.85	1000.00	1050.00	1161.33
*	44.000	32675.00	618.46	.63	160.71	889.29	1000.00	1050.00	1050.00
	45.000	33125.00	618.12	.00	372.90	523.45	1000.00	1042.00	1324.84

45.000	33125.00	618.85	.73	227.29	914.71	1000.00	1042.00	1142.00

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	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
	46.000	33645.00	619.05	.00	437.71	693.00	1000.00	1047.00	1130.70
	46.000	33645.00	619.57	.51	211.00	836.00	1000.00	1047.00	1047.00
*	47.000	34705.00	621.00	.00	395.73	755.98	1000.00	1127.00	1151.71
*	47.000	34705.00	621.45	.45	152.01	974.99	1000.00	1127.00	1127.00
*	48.000	35745.00	622.19	.00	85.84	990.13	1000.00	1058.00	1075.97
*	48.000	35745.00	622.89	.70	58.00	1000.00	1000.00	1058.00	1058.00
*	49.000	36395.00	628.11	.00	104.17	981.66	1012.00	1055.00	1085.84
*	49.000	36395.00	628.15	.04	62.09	1001.34	1012.00	1055.00	1063.42

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SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 14.400 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 14.400 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 15.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 15.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 17.100 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.200 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 18.200 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.400 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 18.400 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 19.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 19.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 20.100 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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 WARNING SECNO=     20.100  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     20.200  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     20.200  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     20.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     20.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     20.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     20.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     21.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     21.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     22.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     22.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     23.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     23.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     24.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     24.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     25.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=     26.200  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     26.200  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     26.200  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 WARNING SECNO=     26.200  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     26.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     26.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
1
    07APR98      12:59:39                                                    PAGE   25


 WARNING SECNO=     26.310  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     26.310  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     26.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     27.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     28.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     28.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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 WARNING SECNO=     29.100  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     29.100  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     29.200  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     30.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     30.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     33.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     33.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     34.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     34.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     35.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     35.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     36.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     36.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=     38.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     38.100  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     38.100  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=     38.100  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     38.100  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     38.100  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=     38.200  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     38.600  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     38.600  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     39.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     40.100  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     40.100  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     40.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     40.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=     40.500  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     40.500  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=     42.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
1
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CAUTION SECNO=     42.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     42.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     43.100  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     43.100  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     44.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     44.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     47.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     47.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     48.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     48.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     49.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     49.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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    07APR98      12:59:39                                                PAGE   27
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Floodway width summary: MILL CREEK
Profile No. 2

Section Number	Elevation Increase	Top Width	Left Encroach Station	Left Sta Distance From Center	Center Station	Right Sta Distance From Center	Right Encroach Station
14.200	1.00	73.00	1000.00	36.50	1036.50	36.50	1073.00
14.300	.78	150.00	970.00	66.50	1036.50	83.50	1120.00
14.400	.61	600.00	1800.00	233.50	2033.50	366.50	2400.00
15.000	.61	360.00	770.00	255.00	1025.00	105.00	1130.00
16.000	.58	520.00	1090.00	486.50	1576.50	33.50	1610.00
17.100	.51	562.00	2260.00	525.00	2785.00	37.00	2822.00
17.200	.53	460.60	2220.19	410.61	2630.80	49.99	2680.79
17.300	.53	461.97	2218.83	411.97	2630.80	49.99	2680.79
17.400	.57	1040.00	2050.00	997.00	3047.00	43.00	3090.00
18.100	.53	798.00	2560.00	766.50	3326.50	31.50	3358.00
18.200	.43	243.88	2042.00	121.94	2163.94	121.94	2285.88
18.300	.42	243.88	2042.00	121.94	2163.94	121.94	2285.88
18.400	.30	233.00	3162.00	53.00	3215.00	180.00	3395.00

19.000	.18	1500.00	1900.00	425.00	2325.00	1075.00	3400.00
20.100	.21	1570.00	1000.00	827.00	1827.00	743.00	2570.00
20.200	.28	1340.00	1300.00	751.00	2051.00	589.00	2640.00
20.300	.27	1340.00	1300.00	751.00	2051.00	589.00	2640.00
20.400	.23	1300.00	1280.00	740.00	2020.00	560.00	2580.00
21.000	.24	1520.00	1620.00	1233.50	2853.50	286.50	3140.00
22.000	.23	1660.00	1200.00	1510.50	2710.50	149.50	2860.00
23.000	.24	1740.00	1160.00	1513.50	2673.50	226.50	2900.00
24.000	.33	1280.00	1740.00	867.50	2607.50	412.50	3020.00
25.000	.36	1095.00	1805.00	444.00	2249.00	651.00	2900.00
26.100	.40	1320.00	580.00	460.00	1040.00	860.00	1900.00
26.110	.42	1320.00	580.00	460.00	1040.00	860.00	1900.00
26.200	.13	1060.00	850.00	33.50	883.50	1026.50	1910.00
26.300	.00	1060.00	850.00	33.50	883.50	1026.50	1910.00
26.310	.01	1120.00	440.00	216.00	656.00	904.00	1560.00
26.400	.02	1060.00	540.00	328.50	868.50	731.50	1600.00
27.000	.12	1060.00	500.00	497.00	997.00	563.00	1560.00
28.000	.53	380.00	320.00	301.00	621.00	79.00	700.00
29.100	.92	640.00	440.00	599.50	1039.50	40.50	1080.00
29.200	.70	605.00	1480.00	324.52	1804.52	280.48	2085.00
29.300	.84	605.00	1480.00	324.52	1804.52	280.48	2085.00
29.400	.61	650.00	1500.00	617.50	2117.50	32.50	2150.00
30.000	.68	642.00	1200.00	604.00	1804.00	38.00	1842.00
31.000	.67	688.00	1800.00	655.00	2455.00	33.00	2488.00
32.000	.71	909.00	2541.00	874.00	3415.00	35.00	3450.00
33.000	.77	163.00	3229.00	136.00	3365.00	27.00	3392.00
34.000	.85	82.00	3250.00	41.00	3291.00	41.00	3332.00
35.000	1.00	528.00	1430.00	504.00	1934.00	24.00	1958.00
36.000	.92	939.00	1280.00	920.50	2200.50	18.50	2219.00
37.000	1.01	1011.00	2900.00	1003.00	3903.00	8.00	3911.00
38.100	.53	149.00	1900.00	124.50	2024.50	24.50	2049.00
38.200	.89	47.00	2000.00	23.50	2023.50	23.50	2047.00
38.300	.89	47.00	2000.00	23.50	2023.50	23.50	2047.00
38.600	.20	263.00	1960.00	55.00	2015.00	208.00	2223.00

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39.000	.69	382.00	894.00	111.75	1005.75	270.25	1276.00
40.100	.76	302.74	1767.26	267.74	2035.00	35.00	2070.00
40.200	.77	250.29	1800.41	234.54	2034.95	15.75	2050.70
40.300	.84	370.61	1680.09	354.86	2034.95	15.75	2050.70
40.400	.85	373.67	1677.04	357.91	2034.95	15.75	2050.70
40.500	.84	285.24	1765.46	269.49	2034.95	15.75	2050.70
40.600	.87	125.00	1925.00	110.00	2035.00	15.00	2050.00
41.000	.96	299.71	844.14	193.36	1037.50	106.34	1143.84
42.000	.14	236.96	1000.00	18.50	1018.50	218.46	1236.96

43.100	.69	105.00	1000.00	35.00	1035.00	70.00	1105.00
43.200	.65	105.00	1000.00	52.50	1052.50	52.50	1105.00
43.300	.65	105.00	1000.00	52.50	1052.50	52.50	1105.00
43.400	.54	152.83	1000.00	62.00	1062.00	90.83	1152.83
44.000	.63	160.71	889.29	135.71	1025.00	25.00	1050.00
45.000	.73	242.00	900.00	121.00	1021.00	121.00	1142.00
46.000	.51	211.00	836.00	187.50	1023.50	23.50	1047.00
47.000	.45	152.02	974.99	88.51	1063.50	63.50	1127.00
48.000	.70	58.00	1000.00	29.00	1029.00	29.00	1058.00
49.000	.04	62.09	1001.34	32.16	1033.50	29.92	1063.42

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FLOODWAY DATA, MILL CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
14.200	73.	791.	5.6	585.5	584.5	1.0
14.300	103.	920.	4.9	585.8	585.0	.8
14.400	600.	3550.	1.3	586.3	585.7	.6
15.000	360.	1873.	2.4	586.6	586.0	.6
16.000	520.	2353.	1.9	587.1	586.5	.6
17.100	562.	2680.	1.7	587.1	586.6	.5
17.200	455.	2694.	1.7	587.2	586.7	.5
17.300	457.	2704.	1.7	587.2	586.7	.5
17.400	1036.	4289.	1.0	587.4	586.8	.6
18.100	798.	3513.	1.3	587.5	587.0	.5
18.200	213.	942.	4.7	587.8	587.4	.4
18.300	214.	949.	4.7	587.8	587.4	.4
18.400	233.	1156.	3.9	588.4	588.1	.3
19.000	1500.	4695.	1.0	590.1	589.9	.2
20.100	1570.	7164.	.6	590.3	590.1	.2
20.200	89.	771.	5.8	590.4	590.1	.3
20.300	89.	774.	5.8	590.5	590.2	.3
20.400	1300.	9265.	.5	591.1	590.9	.2
21.000	1520.	8503.	.5	591.2	591.0	.2
22.000	1660.	3316.	1.3	591.2	591.0	.2
23.000	1740.	2316.	1.9	591.5	591.3	.2
24.000	1280.	4682.	1.0	592.2	591.9	.3
25.000	1095.	5526.	.8	592.3	591.9	.4

26.100	1320.	6118.	.7	592.4	592.0	.4
26.110	1320.	5695.	.8	592.4	592.0	.4
26.200	1060.	3497.	1.3	592.4	592.3	.1
26.300	1060.	5705.	.8	594.6	594.6	.0
26.310	711.	3556.	1.3	594.6	594.6	.0
26.400	639.	3426.	1.3	594.8	594.8	.0
27.000	1060.	4823.	.9	595.0	594.9	.1
28.000	380.	1233.	3.6	595.7	595.2	.5
29.100	634.	2499.	1.8	598.1	597.2	.9
29.200	361.	1535.	2.9	599.0	598.3	.7
29.300	74.	684.	6.5	599.4	598.6	.8
29.400	648.	2174.	2.1	600.4	599.8	.6
30.000	631.	2956.	.9	600.9	600.2	.7
31.000	680.	2775.	1.0	601.0	600.3	.7
32.000	901.	3394.	.8	601.2	600.5	.7
33.000	158.	1001.	2.7	601.5	600.7	.8
34.000	75.	478.	5.7	602.0	601.1	.9
35.000	525.	1894.	1.4	603.2	602.2	1.0
36.000	939.	3496.	.8	603.5	602.6	.9

1

FLOODWAY DATA, MILL CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
37.000	1011.	3162.	.9	604.0	603.0	1.0
38.100	144.	339.	8.0	605.1	604.6	.5
38.200	47.	324.	8.3	607.8	606.9	.9
38.300	47.	364.	7.4	608.7	607.8	.9
38.600	263.	1057.	2.6	609.5	609.3	.2
39.000	382.	1480.	1.8	610.7	610.0	.7
40.100	303.	1222.	2.2	611.0	610.2	.8
40.200	250.	954.	2.8	611.0	610.2	.8
40.300	371.	1100.	2.5	611.2	610.4	.8
40.400	374.	1127.	2.4	611.3	610.4	.9
40.500	285.	1098.	2.5	611.2	610.4	.8
40.600	125.	676.	4.0	611.2	610.3	.9
41.000	300.	1201.	2.3	612.3	611.3	1.0
42.000	235.	410.	6.6	613.4	613.3	.1

43.100	105.	612.	4.4	617.6	616.9	.7
43.200	104.	766.	3.5	617.9	617.2	.7
43.300	104.	767.	3.5	617.9	617.2	.7
43.400	153.	1003.	2.7	618.0	617.5	.5
44.000	161.	879.	3.1	618.4	617.8	.6
45.000	227.	770.	3.5	618.8	618.1	.7
46.000	211.	615.	4.4	619.6	619.1	.5
47.000	152.	875.	3.1	621.5	621.0	.5
48.000	58.	288.	9.4	622.9	622.2	.7
49.000	62.	383.	7.1	628.1	628.1	.0

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    03AUG07    TIME   09:10:09  *
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***************************************
*  U.S. ARMY CORPS OF ENGINEERS       *
*  HYDROLOGIC ENGINEERING CENTER      *
*  609 SECOND STREET, SUITE D         *
*  DAVIS, CALIFORNIA 95616-4687       *
*          (916) 756-1104             *
***************************************
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```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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THIS RUN EXECUTED 03AUG07 09:10:09

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***********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
***********************************
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```
T1      Flood Insurance Study-Butler County, Ohio       (EMW-93-4106)
T2      100-Year Flood
T3      MILL CREEK
T4      Duplicate Effective Model 07-05-07

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

        0         4                                                             584.46

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1
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J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    115        200         38         66          1         52          4         53         21         22
     54

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10
  Starting WSL from MCSHARON.HC2 output
   Peak flow from MILL95.HC1 SR747D
   Current effective floodway will be maintained

QT        5       2467       4009       4465       6335       4465
NC     0.08       0.08       0.04        0.3        0.5
ET                                                            9.1       1000       1073       1000       1073
  Section modified by Crescent Park
  Section revised based on 9/93 Signco drainage plan by Neyer
  and 2/26/94 bridge survey
X1     14.2         17       1000       1073        100      100.0      100.0
X3       10                                                                      585.5      586.4
GR      586        350        585        795        585        900        584        950        583        970
GR    581.8       1000      575.4       1022        572       1027      569.7       1030      569.7     1030.1
GR      570     1031.4        570     1031.5        572       1050      577.5       1073      582.9       1105
GR      582       1680        586       1740

ET                                                            9.1        970       1120        970       1120
   CRESCENTVILLE ROAD BRIDGE
   Top of Road 585.6, low chord 584.5
   Bridge area west of west pier ineffective flow
SB     1.00       1.56       2.80       0.00       19.0       2.00        657       1.91        570        570
1
   03AUG07      09:10:09                                                                                  PAGE    2


X1     14.3                                          32.0       32.0       32.0
X2                              1      584.5       585.6
X3       10                                                                      585.6      586.4
BT       -6        350        586                   795      585.6                1000      585.6
BT                1073      586.4                  1340        588                1540        590

NH        7        1.0       1710       0.06       1988       0.13       2000       0.04       2067       0.13
NH     2100       0.08       2200        1.0       2630
  Butler County Section A
  Section 14.4 2/26/94 survey section u/s of Crescentville Rd
  ET field 9 and 10 original FIS floodway, field 7, 8 optimized floodway
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ET                                                                  9.1       1800       2200       1800       2400
X1     14.4         18       2000       2067        120          120        120
GR      588        750      585.8        925      585.1         1050      581.8       1150      583.2       1200
GR    581.4       1710      579.2       1988      580.8         2000        572       2001      570.9       2002
GR    570.2       2030      573.2       2032      577.6         2040      579.7       2067        582       2100
GR      582       2200        582       2590        589         2630

NC     0.08       0.12       0.04        0.1        0.3
NH        7        1.0        713       0.06        984         0.13       1000       0.04       1050       0.13
NH     1076       0.12       1131        1.0       1757
  Butler County Section B
  Section 15.0  4/94 survey section CM-1
ET                                                                  9.1        770       1130        770       1130
X1     15.0         40       1000       1050        800          800        840
GR   588.80        192     586.99        196     584.53          203     584.05        240     583.89        331
GR   583.14        437     582.85        505     581.98          713     582.00        814     582.66        930
GR   581.96        971     581.11        976     581.99          984     582.22        994     580.75       1000
GR   573.51       1002     571.58       1003     570.18         1006      570.6       1011     571.97       1017
GR   572.68       1022     573.55       1025     575.49         1028     579.35       1034     579.03       1040
GR   579.26       1045     580.52       1050      582.5         1060     581.39       1067     582.06       1070
GR   583.19       1076     583.19       1082     582.52         1086     583.21       1098     584.53       1131
GR   586.15       1271     585.83       1364     586.09         1462     587.62       1611     588.48       1757

NH        5        1.0       1090       0.06       1530         0.13       1543       0.04       1610       0.13
NH     1770
  Butler County Section C, old section D
  Original HEC-2 data with both floodplains modified using 1980 topo
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 2+50
ET                                                                  9.1       1200       1610       1090       1610
X1     16.0         17       1543       1610        680          630        650
GR    587.5        500        585        540        584          750       584.5       1000      584.3       1090
GR    584.0       1190        583       1380        582         1530        580       1543        577       1550
GR    573.2       1559      573.2       1572        583         1597        585       1610        590       1660
GR      595       1678      595.3       1770

NH        5        1.0       1625       0.06       2730         0.13       2748       0.04       2822       0.13
NH     3001
  Butler County Section D, old section E
  Section E is modified to exclude East Fork Mill Creek
  Section extended 1000' to the north (left bank)
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 3+50
1
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ET                                                          9.1       2400       2822       2260       2822
X1      17.1         16       2748       2822        150      100        100
GR      0592          0        590        230        588      550        588       1070        586       1476
GR       584       1625        584       2400        582     2730        582       2748      573.7       2764
GR     573.7       2797        586       2822        590     2832        594       2850      595.6       3000
GR     595.8       3001

NC      0.10       0.12      0.055        0.3        0.5
  Section taken off Windisch Road bridge plan 3/84
  Sheet 18/34, "Channel Sections, Mill Creek" Station 5+00
ET                                                         10.4       2400       2822       2160       3100
X1      17.2         20       3000     3118.6        300      130        140      0.843         0.
X3        10                                                                    584.5      592.0
GR     592.0        330      590.0        760        589     1000      587.8       1330      585.5       1885
GR       584       2227      583.8       2327      583.6     2427      583.4       2527      583.2       2627
GR     583.0       2727      582.5       2877      581.5     2927      581.5       2977        582       3000
GR     573.6     3026.9      573.6     3082.7        590   3118.6      593.5     3168.6      594.8     3218.6
  Windisch Road (BUT-CR 127-0.40)
  Bridge data obtained from Butler County Bridge Plan Project BRZ-0905(1), 1984.
  Top of Road 592, Low chord 589
  1959 highwater mark from COE report 585.5 approximatly

ET                                                         10.4       2600       2680       2160       3100
SB      1.25        1.5        2.0          0         45        2        976          2      573.6      573.6
NC                                         0.3        0.5
X1      17.3         20       3000     3118.6         34       34         34      0.843
X2                                1        587.8      584.5                                            0.843
X3        10                                                                    584.5        592
BT       -20        330        592                   760      590                1000        589
BT                 1330        588                  1885      586                2227      585.2
BT                 2327      585.1                  2427      585                2527        585
BT                 2627      584.8                  2727    584.5                2877      585.2
BT                 2927      586.1                  2977    587.2                3000      587.9
BT               3026.9      588.7                3082.7    590.4              3118.6      592.0
BT               3168.6      593.5                3218.6    594.8
GR     592.0        330      590.0        760        589     1000      587.8       1330      585.5       1885
GR       584       2227      583.8       2327      583.6     2427      583.4       2527      583.2       2627
GR     583.0       2727      582.5       2877      581.5     2927      581.5       2977        582       3000
GR     573.6     3026.9      573.6     3082.7        590   3118.6      593.5     3168.6      594.8     3218.6

NH         4        1.0       2510       0.06       3013     0.04       3059       0.13       3126
  left bank elevation was changed from 588 to 583
  Cross Section revised using Butler County bridge plans for Windisch Road,
  Channel Station 7+00, and Butler County 1980 Topos (1-26-94).
  Section E
ET                                                          9.1       2700       3094       2050       3090
X1      17.4         12       3000       3094        150      210        183
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GR      592        430        590        590        588        1470        586        1993        584        2510
GR      583        2864       581.8      2910       580.0      3000        573.8      3013        573.8      3059
GR    591.5        3094        600       3126
1
    03AUG07      09:10:09                                                                          PAGE     4


NC                                          0.1        0.3
NH        5        1.0        2690        0.06       3220       0.13        3295       0.04        3358       0.13
NH     3500
1
    03AUG07      09:10:09                                                                          PAGE     5


T1      Flood Insurance Study EMW-93-C-4106
T2      Floodway Analysis
T3      Mill Creek              Butler County, Ohio
T4      Duplicate Effective Model 07-05-07

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0        6                                                                  585.46

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      2                  -1

1
    03AUG07      09:10:09                                                                          PAGE     6


                                                                  THIS RUN EXECUTED 03AUG07     09:10:09

************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MILL CREEK
```

SUMMARY PRINTOUT

	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
	14.200	.00	584.46	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.200	.00	585.46	1.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.04	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.82	.78	103.00	970.00	1000.00	1073.00	1073.00
*	14.400	152.00	585.73	.00	1673.60	937.71	2000.00	2067.00	2611.31
*	14.400	152.00	586.33	.61	600.00	1800.00	2000.00	2067.00	2400.00
*	15.000	992.00	585.98	.00	1160.12	198.86	1000.00	1050.00	1421.81
*	15.000	992.00	586.59	.61	360.00	770.00	1000.00	1050.00	1130.00
	16.000	1642.00	586.50	.00	1109.08	515.95	1543.00	1610.00	1625.03
	16.000	1642.00	587.08	.58	520.00	1090.00	1543.00	1610.00	1610.00
*	17.100	1742.00	586.64	.00	1478.20	1345.41	2748.00	2822.00	2823.61
	17.100	1742.00	587.15	.51	562.00	2260.00	2748.00	2822.00	2822.00
	17.200	1882.00	586.70	.00	1278.96	1395.75	2580.81	2680.79	2674.71
	17.200	1882.00	587.23	.53	455.49	2220.19	2580.81	2680.79	2675.68
	17.300	1916.00	586.71	.00	1280.85	1393.88	2580.81	2680.79	2674.73
	17.300	1916.00	587.24	.53	456.88	2218.83	2580.81	2680.79	2675.70
	17.400	2099.00	586.82	.00	1306.29	1778.46	3000.00	3094.00	3084.75
	17.400	2099.00	587.39	.57	1035.88	2050.00	3000.00	3094.00	3085.88

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 14.400 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 14.400 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 15.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 15.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 17.100 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

1

Floodway width summary: MILL CREEK
Profile No. 2

Section Number	Elevation Increase	Top Width	Left Encroach Station	Left Sta Distance From Center	Center Station	Right Sta Distance From Center	Right Encroach Station
14.200	1.00	73.00	1000.00	36.50	1036.50	36.50	1073.00
14.300	.78	150.00	970.00	66.50	1036.50	83.50	1120.00
14.400	.61	600.00	1800.00	233.50	2033.50	366.50	2400.00
15.000	.61	360.00	770.00	255.00	1025.00	105.00	1130.00
16.000	.58	520.00	1090.00	486.50	1576.50	33.50	1610.00
17.100	.51	562.00	2260.00	525.00	2785.00	37.00	2822.00
17.200	.53	460.60	2220.19	410.61	2630.80	49.99	2680.79
17.300	.53	461.97	2218.83	411.97	2630.80	49.99	2680.79
17.400	.57	1040.00	2050.00	997.00	3047.00	43.00	3090.00

1

FLOODWAY DATA, MILL CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
14.200	73.	791.	5.6	585.5	584.5	1.0
14.300	103.	920.	4.9	585.8	585.0	.8
14.400	600.	3550.	1.3	586.3	585.7	.6
15.000	360.	1873.	2.4	586.6	586.0	.6
16.000	520.	2353.	1.9	587.1	586.5	.6
17.100	562.	2680.	1.7	587.1	586.6	.5
17.200	455.	2694.	1.7	587.2	586.7	.5
17.300	457.	2704.	1.7	587.2	586.7	.5
17.400	1036.	4289.	1.0	587.4	586.8	.6

THIS RUN EXECUTED 21AUG07 10:28:29

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**********************************
 HEC-2 WATER SURFACE PROFILES
 Version   4.6.2;  May 1991
**********************************

T1      Flood Insurance Study-Butler County, Ohio       (EMW-93-4106)
T2      100-Year Flood
T3      MILL CREEK
T4      Revised Existing Conditions Model 07-05-07

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0        4                                                          584.46

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1        0        -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    115       200        38        66         1        52         4        53        21        22
     54

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10
  Starting WSL from MCSHARON.HC2 output
   Peak flow from MILL95.HC1 SR747D
   Current effective floodway will be maintained

QT        5      2467      4009      4465      6335      4465
NC     0.08      0.08      0.04       0.3       0.5
ET                                                     9.1      1000      1073      1000      1073
  Section modified by Crescent Park
  Section revised based on 9/93 Signco drainage plan by Neyer
  and 2/26/94 bridge survey
X1     14.2        17      1000      1073       100     100.0     100.0
X3       10                                                               585.5     586.4
GR      586       350       585       795       585       900       584       950       583       970
GR    581.8      1000     575.4      1022       572      1027     569.7      1030     569.7    1030.1
GR      570    1031.4       570    1031.5       572      1050     577.5      1073     582.9      1105
GR      582      1680       586      1740
ET                                                     9.1       970      1120       970      1120
   CRESCENTVILLE ROAD BRIDGE
   Top of Road 585.6, low chord 584.5
   Bridge area west of west pier ineffective flow
SB     1.00      1.56      2.80      0.00      19.0      2.00       657      1.91       570       570
```

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X1     14.3                                    32.0       32.0       32.0
X2                          1      584.5       585.6
X3       10                                                        585.6      586.4
BT       -6       350       586                795       585.6      1000       585.6
BT                1073      586.4              1340        588       1540         590

NH        7        1.0      1710       0.06    1988       0.13      2000       0.04      2067       0.13
NH     2100       0.08      2200        1.0    2630
  Butler County Section A
  Section 14.4 2/26/94 survey section u/s of Crescentville Rd
  ET field 9 and 10 original FIS floodway, field 7, 8 optimized floodway
ET                                                      9.1       1800       2200       1800       2400
X1     14.4         18      2000       2067     120    120        120
GR      588        750      585.8       925     585.1  1050       581.8      1150       583.2      1200
GR    581.4       1710      579.2      1988     580.8  2000        572       2001       570.9      2002
GR    570.2       2030      573.2      2032     577.6  2040       579.7      2067        582       2100
GR     582        2200       582       2590      589   2630

NC     0.08       0.12      0.04        0.1      0.3
NH        7        1.0       770       0.06     984       0.13      1000       0.04      1050       0.13
NH     1076       0.12      1131        1.0     1757
  Butler County Section B
  Section 15.0  4/94 survey section CM-1
ET                                                      9.1        770       1130        770       1130
X1     15.0         40      1000       1050     800    800        840
GR   588.80        192     586.99       196    584.53  203       584.05      240       583.89       331
GR   583.14        437     582.85       505    581.98  713       582.00      814       582.66       930
GR   581.96        971     581.11       976    581.99  984       582.22      994       580.75      1000
GR   573.51       1002     571.58      1003    570.18  1006       570.6      1011       571.97      1017
GR   572.68       1022     573.55      1025    575.49  1028      579.35      1034       579.03      1040
GR   579.26       1045     580.52      1050     582.5  1060      581.39      1067       582.06      1070
GR   583.19       1076     583.19      1082    582.52  1086      583.21      1098       584.53      1131
GR   586.15       1271     585.83      1364    586.09  1462      587.62      1611       588.48      1757

NH        6        1.0       910        1.0     1515       0.06      1728       0.13      1844       0.04
NH     1892       0.13      1950
  Section B2 - New Section For Development East of Windisch Road
  Section 15.5  Existing Conditions 07/2007 BB Field Topo Merged w/Aerial Topo
ET                                                      9.1                                 1515       1927
X1     15.5         22      1844       1892     346    334        365
X3       10                                                                    582.5
GR   588.00        927     586.00       946    585.00  1067      584.00      1306       583.00      1382
GR   582.00       1410     581.00      1436    580.00  1480      579.50      1515       579.25      1538
GR   579.14       1602     580.00      1641    581.00  1672      582.00      1702       582.50      1728
GR   580.00       1844     571.85      1855    571.85  1877      585.00      1892       589.00      1908
GR   589.80       1927     590.00      1950

NH        5        1.0      1090       0.06     1530       0.13      1543       0.04      1610       0.13
NH     1770
  Butler County Section C, old section D
  Original HEC-2 data with both floodplains modified using 1980 topo
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 2+50
  Existing Conditions 07/2007 BB Field Topo Merged w/Aerial Topo
```

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ET                                                          9.1      1200      1610      1090      1610
X1      16.0        27      1543      1610       290       290       295
X3        10                                                        582.50
GR     587.5       500       586       550       585       730     584.7       844      585.0       908
GR     586.0      1028       585      1080       584      1124       583      1182       581      1188
GR     580.0      1200     579.0      1225    576.94      1312       579      1360       580      1400
GR       581      1435       582      1500       582      1530       580      1543       577      1550
GR     573.2      1559     573.2      1572       583      1597       585      1610       590      1660
GR     595.0      1678     595.3      1770

NH         5       1.0      1625      0.06      2730      0.13      2748      0.04      2822      0.13
NH      3001
  Butler County Section D, old section E
  Section E is modified to exclude East Fork Mill Creek
  Section extended 1000' to the north (left bank)
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 3+50
ET                                                          9.1      2400      2822      2260      2822
X1      17.1        26      2748      2822       150       100       100
X3        10                                                        582.5
GR     0592         0       590       230       588       550       588      1070       586      1476
GR     587.5      1610       587      1764       588      1787       588      1870       585      1900
GR     584.5      1995       585      2075     584.5      2260       584      2285       583      2405
GR       577      2425       577      2600     582.0      2630     583.5      2748     573.7      2764
GR     573.7      2797       586      2822       590      2832       594      2850     595.6      3000
GR     595.8      3001

NC      0.10       0.12     0.055       0.3       0.5
  Section taken off Windisch Road bridge plan 3/84
  Sheet 18/34, "Channel Sections, Mill Creek" Station 5+00
ET                                                         10.4      2400      2822      2160      3100
X1      17.2        20      3000    3118.6       300       130       140     0.843        0.
X3        10                                                        584.5     592.0
GR     592.0       330     590.0       760       589      1000     587.8      1330     585.5      1885
GR       584      2227     583.8      2327     583.6      2427     583.4      2527     583.2      2627
GR     583.0      2727     582.5      2877     581.5      2927     581.5      2977       582      3000
GR     573.6    3026.9     573.6    3082.7       590    3118.6     593.5    3168.6     594.8    3218.6
  Windisch Road (BUT-CR 127-0.40)
  Bridge data obtained from Butler County Bridge Plan Project BRZ-0905(1), 1984.
  Top of Road 592, Low chord 589
  1959 highwater mark from COE report 585.5 approximatly

ET                                                         10.4      2600      2680      2160      3100
SB      1.25       1.5       2.0         0        45         2       976         2     573.6     573.6
NC                                     0.3       0.5
X1      17.3        20      3000    3118.6        34        34        34     0.843
X2                             1       587.8     584.5                                 0.843
X3        10                                                        584.5       592
BT       -20       330       592                 760       590                1000       589
BT                1330       588                1885       586                2227     585.2
BT                2327     585.1                2427       585                2527       585
BT                2627     584.8                2727     584.5                2877     585.2
BT                2927     586.1                2977     587.2                3000     587.9
BT              3026.9     588.7              3082.7     590.4                3118.6     592.0
```

```
BT              3168.6      593.5              3218.6      594.8
GR    592.0       330       590.0       760      589       1000      587.8      1330      585.5      1885
GR      584      2227       583.8      2327     583.6      2427      583.4      2527      583.2      2627
GR    583.0      2727       582.5      2877     581.5      2927      581.5      2977        582      3000
GR    573.6    3026.9       573.6    3082.7       590    3118.6      593.5    3168.6      594.8    3218.6

NH        4       1.0        2510      0.06      3013      0.04       3059      0.13       3126
  left bank elevation was changed from 588 to 583
  Cross Section revised using Butler County bridge plans for Windisch Road,
  Channel Station 7+00, and Butler County 1980 Topos (1-26-94).
  Section E
ET                                                          9.1       2700      3094      2050      3090
X1      17.4        12        3000      3094       150       210        183
GR       592       430         590       590       588      1470        586      1993       584      2510
GR       583      2864       581.8      2910     580.0      3000      573.8      3013     573.8      3059
GR     591.5      3094         600      3126
NC                                     0.1       0.3
NH        5       1.0        2690      0.06      3220      0.13       3295      0.04      3358      0.13
NH     3500
```

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T1      Flood Insurance Study EMW-93-C-4106
T2      Floodway Analysis
T3      Mill Creek              Butler County, Ohio
T4      Corrected Effective Model 07-05-07
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	6							585.46	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2		-1							

THIS RUN EXECUTED 21AUG07 10:28:29

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MILL CREEK

SUMMARY PRINTOUT

	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
	14.200	.00	584.46	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.200	.00	585.46	1.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.04	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.82	.78	103.00	970.00	1000.00	1073.00	1073.00
*	14.400	152.00	585.73	.00	1673.60	937.71	2000.00	2067.00	2611.31
*	14.400	152.00	586.33	.61	600.00	1800.00	2000.00	2067.00	2400.00
*	15.000	992.00	585.98	.00	1160.12	198.86	1000.00	1050.00	1421.81
*	15.000	992.00	586.59	.61	360.00	770.00	1000.00	1050.00	1130.00
	15.500	1357.00	586.27	.00	953.61	943.46	1844.00	1892.00	1897.07
*	15.500	1357.00	586.88	.61	384.52	1515.00	1844.00	1892.00	1899.52
	16.000	1652.00	586.40	.00	1087.30	536.69	1543.00	1610.00	1623.99
*	16.000	1652.00	586.99	.60	520.00	1090.00	1543.00	1610.00	1610.00
	17.100	1752.00	586.43	.00	1064.16	1387.99	2748.00	2822.00	2823.08
	17.100	1752.00	587.02	.59	562.00	2260.00	2748.00	2822.00	2822.00
*	17.200	1892.00	586.46	.00	1228.69	1445.56	2580.81	2680.79	2674.26
*	17.200	1892.00	587.03	.57	417.03	2258.28	2580.81	2680.79	2675.31
	17.300	1926.00	586.48	.00	1233.63	1440.67	2580.81	2680.79	2674.30
	17.300	1926.00	587.05	.57	421.05	2254.30	2580.81	2680.79	2675.35
	17.400	2109.00	586.61	.00	1250.28	1834.05	3000.00	3094.00	3084.33
	17.400	2109.00	587.23	.62	1035.55	2050.00	3000.00	3094.00	3085.55

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 14.400 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 14.400 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 15.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 15.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 15.500 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 16.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 17.200 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 17.200 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

Floodway width summary: MILL CREEK
Profile No. 2

Section Number	Elevation Increase	Top Width	Left Encroach Station	Left Sta Distance From Center	Center Station	Right Sta Distance From Center	Right Encroach Station
14.200	1.00	73.00	1000.00	36.50	1036.50	36.50	1073.00
14.300	.78	150.00	970.00	66.50	1036.50	83.50	1120.00
14.400	.61	600.00	1800.00	233.50	2033.50	366.50	2400.00
15.000	.61	360.00	770.00	255.00	1025.00	105.00	1130.00
15.500	.61	412.00	1515.00	353.00	1868.00	59.00	1927.00
16.000	.60	520.00	1090.00	486.50	1576.50	33.50	1610.00
17.100	.59	562.00	2260.00	525.00	2785.00	37.00	2822.00
17.200	.57	422.51	2258.28	372.52	2630.80	49.99	2680.79
17.300	.57	426.49	2254.30	376.50	2630.80	49.99	2680.79
17.400	.62	1040.00	2050.00	997.00	3047.00	43.00	3090.00

FLOODWAY DATA, MILL CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
14.200	73.	791.	5.6	585.5	584.5	1.0
14.300	103.	920.	4.9	585.8	585.0	.8
14.400	600.	3550.	1.3	586.3	585.7	.6
15.000	360.	1873.	2.4	586.6	586.0	.6
15.500	385.	2667.	1.7	586.9	586.3	.6
16.000	520.	3524.	1.3	587.0	586.4	.6
17.100	562.	3870.	1.2	587.0	586.4	.6
17.200	417.	2458.	1.8	587.1	586.5	.6
17.300	421.	2483.	1.8	587.1	586.5	.6
17.400	1036.	4117.	1.1	587.2	586.6	.6

```
**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************

T1      Flood Insurance Study-Butler County, Ohio       (EMW-93-4106)
T2      100-Year Flood
T3      MILL CREEK
T4      Revised Proposed Conditions Model 10-19-07

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0        4                                                          584.46

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1        0        -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    115       200        38        66         1        52         4        53        21        22
     54

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10
  Starting WSL from MCSHARON.HC2 output
   Peak flow from MILL95.HC1 SR747D
   Current effective floodway will be maintained

QT        5      2467      4009      4465      6335      4465
NC     0.08      0.08      0.04       0.3       0.5
ET                                                     9.1      1000      1073      1000      1073
  Section modified by Crescent Park
  Section revised based on 9/93 Signco drainage plan by Neyer
  and 2/26/94 bridge survey
X1     14.2        17      1000      1073       100     100.0     100.0
X3       10                                                               585.5     586.4
GR      586       350       585       795       585       900       584       950       583       970
GR    581.8      1000     575.4      1022       572      1027     569.7      1030     569.7    1030.1
GR      570    1031.4       570    1031.5       572      1050     577.5      1073     582.9      1105
GR      582      1680       586      1740

ET                                                     9.1       970      1120       970      1120
```

Revised Proposed

```
   CRESCENTVILLE ROAD BRIDGE
   Top of Road 585.6, low chord 584.5
   Bridge area west of west pier ineffective flow
SB      1.00       1.56       2.80       0.00       19.0       2.00        657       1.91        570        570
X1      14.3                                         32.0       32.0       32.0
X2                                    1      584.5    585.6
X3        10                                                                      585.6      586.4
BT        -6        350        586                   795      585.6                 1000      585.6
BT                 1073      586.4                  1340        588                 1540        590

NH         7        1.0       1710       0.06       1988       0.13        2000       0.04       2067       0.13
NH      2100       0.08       2200        1.0       2630
  Butler County Section A
  Section 14.4 2/26/94 survey section u/s of Crescentville Rd
  ET field 9 and 10 original FIS floodway, field 7, 8 optimized floodway
ET                                                                 9.1       1800       2200       1800       2400
X1      14.4         18       2000       2067        120        120        120
GR       588        750      585.8        925      585.1       1050      581.8       1150      583.2       1200
GR     581.4       1710      579.2       1988      580.8       2000        572       2001      570.9       2002
GR     570.2       2030      573.2       2032      577.6       2040      579.7       2067        582       2100
GR       582       2200        582       2590        589       2630

NC      0.08       0.12       0.04        0.1        0.3
NH         7        1.0        770       0.06        984       0.13        1000       0.04       1050       0.13
NH      1076       0.12       1131        1.0       1757
  Butler County Section B
  Section 15.0  4/94 survey section CM-1
ET                                                                 9.1        770       1130        770       1130
X1      15.0         40       1000       1050        800        800        840
GR    588.80        192     586.99        196     584.53        203     584.05        240     583.89        331
GR    583.14        437     582.85        505     581.98        713     582.00        814     582.66        930
GR    581.96        971     581.11        976     581.99        984     582.22        994     580.75       1000
GR    573.51       1002     571.58       1003     570.18       1006      570.6       1011     571.97       1017
GR    572.68       1022     573.55       1025     575.49       1028     579.35       1034     579.03       1040
GR    579.26       1045     580.52       1050      582.5       1060     581.39       1067     582.06       1070
GR    583.19       1076     583.19       1082     582.52       1086     583.21       1098     584.53       1131
GR    586.15       1271     585.83       1364     586.09       1462     587.62       1611     588.48       1757

NH         6        1.0        910        1.0       1515       0.06        1782       0.13       1844       0.04
NH      1892       0.13       1950
```

```
 Section B2 - New Section For Development East of Windisch Road
  Section 15.5  Existing Conditions 07/2007 BB Field Topo Merged w/Aerial Topo
ET                                                   9.1                              1515       1927
X1      15.5       22      1844      1892       346       334       365
X3        10                                                                 582.5
GR    586.00      946    583.20       979    584.00      1018    585.00      1081    585.80     1125
GR    589.80     1126    589.80      1408    589.00      1420    587.75      1476    587.75     1507
GR    578.80     1580    580.00      1641    579.00      1770    579.00      1772    582.00     1782
GR    580.00     1844    571.85      1855    571.85      1877    585.00      1892    589.00     1908
GR    589.80     1927    590.00      1950

NH         5      1.0      1090      0.06      1530      0.13      1543      0.04      1610      0.13
NH      1770
  Butler County Section C, old section D
  Original HEC-2 data with both floodplains modified using 1980 topo
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 2+50
  Existing Conditions 07/2007 BB Field Topo Merged w/Aerial Topo
ET                                                   9.1      1200      1610      1090       1610
X1      16.0       22      1543      1610       290       290       295
X3        10                                                                 582.5
GR     588.0      480       586       485       585       594     585.8       722     589.8      723
GR     589.8      987       589      1000       588      1047       579      1080       578     1090
GR     577.4     1332       578      1495       582      1507       581      1543       577     1550
GR     573.2     1559     573.2      1572       583      1597       585      1610       590     1660
GR     595.0     1678     595.3      1770

NH         5      1.0      1625      0.06      2730      0.13      2748      0.04      2822      0.13
NH      3001
  Butler County Section D, old section E
  Section E is modified to exclude East Fork Mill Creek
  Section extended 1000' to the north (left bank)
  Channel area replaced by Windisch Road bridge plan sheet 3/84
  Sheet 17/34 "Channel Sections" station 3+50
ET                                                   9.1      2400      2822      2260       2822
X1      17.1       26      2748      2822       150       100       100
X3        10                                                                 583.5     586.0
GR      0592        0       590       230       588       550       588      1070       586     1476
GR     587.5     1610       587      1764       588      1787     589.8      1870       589     1895
GR     589.0     2016     589.8      2029       585      2133     586.0      2179       585     2232
GR     581.0     2250       578      2256       577      2411     583.5      2748     573.7     2764
GR     573.7     2797       586      2822       590      2832       594      2850     595.6     3000
GR     595.8     3001

NC      0.10     0.12     0.055       0.3       0.5
```

Section taken off Windisch Road bridge plan 3/84
Sheet 18/34, "Channel Sections, Mill Creek" Station 5+00

ET						10.4	2400	2822	2160	3100
X1	17.2	20	3000	3118.6	300	130	140	0.843	0.	
X3	10							584.5	592.0	
GR	592.0	330	590.0	760	589	1000	587.8	1330	585.5	1885
GR	584	2227	583.8	2327	583.6	2427	583.4	2527	583.2	2627
GR	583.0	2727	582.5	2877	581.5	2927	581.5	2977	582	3000
GR	573.6	3026.9	573.6	3082.7	590	3118.6	593.5	3168.6	594.8	3218.6

Windisch Road (BUT-CR 127-0.40)
Bridge data obtained from Butler County Bridge Plan Project BRZ-0905(1), 1984.
Top of Road 592, Low chord 589
1959 highwater mark from COE report 585.5 approximatly

ET						10.4	2600	2680	2160	3100
SB	1.25	1.5	2.0	0	45	2	976	2	573.6	573.6
NC				0.3	0.5					
X1	17.3	20	3000	3118.6	34	34	34	0.843		
X2			1	587.8	584.5				0.843	
X3	10							584.5	592	
BT	-20	330	592		760	590		1000	589	
BT		1330	588		1885	586		2227	585.2	
BT		2327	585.1		2427	585		2527	585	
BT		2627	584.8		2727	584.5		2877	585.2	
BT		2927	586.1		2977	587.2		3000	587.9	
BT		3026.9	588.7		3082.7	590.4		3118.6	592.0	
BT		3168.6	593.5		3218.6	594.8				
GR	592.0	330	590.0	760	589	1000	587.8	1330	585.5	1885
GR	584	2227	583.8	2327	583.6	2427	583.4	2527	583.2	2627
GR	583.0	2727	582.5	2877	581.5	2927	581.5	2977	582	3000
GR	573.6	3026.9	573.6	3082.7	590	3118.6	593.5	3168.6	594.8	3218.6

NH	4	1.0	2510	0.06	3013	0.04	3059	0.13	3126	

```
left bank elevation was changed from 588 to 583
   Cross Section revised using Butler County bridge plans for Windisch Road,
   Channel Station 7+00, and Butler County 1980 Topos (1-26-94).
   Section E
ET                                                          9.1       2700       3094       2050       3090
X1      17.4         12       3000       3094        150      210        183
GR       592        430        590        590        588     1470        586       1993        584       2510
GR       583       2864      581.8       2910      580.0     3000      573.8       3013      573.8       3059
GR     591.5       3094        600       3126
NC                                        0.1        0.3
NH         5        1.0       2690       0.06       3220     0.13       3295       0.04       3358       0.13
NH      3500

T1       Flood Insurance Study EMW-93-C-4106
T2       Floodway Analysis
T3       Mill Creek                Butler County, Ohio
T4       Proposed Conditions Model 07-05-07

J1   ICHECK      INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
          0        6                                                                  585.46

J2   NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
          2               -1
```

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MILL CREEK

SUMMARY PRINTOUT

	SECNO	CUMDS	CWSEL	DIFKWS	TOPWID	SSTA	STCHL	STCHR	ENDST
	14.200	.00	584.46	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.200	.00	585.46	1.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.04	.00	73.00	1000.00	1000.00	1073.00	1073.00
	14.300	32.00	585.82	.78	103.00	970.00	1000.00	1073.00	1073.00
*	14.400	152.00	585.73	.00	1673.60	937.71	2000.00	2067.00	2611.31
*	14.400	152.00	586.33	.61	600.00	1800.00	2000.00	2067.00	2400.00
*	15.000	992.00	585.98	.00	1160.12	198.86	1000.00	1050.00	1421.81
*	15.000	992.00	586.59	.61	360.00	770.00	1000.00	1050.00	1130.00
*	15.500	1357.00	586.26	.00	556.99	946.00	1844.00	1892.00	1897.03
*	15.500	1357.00	586.88	.62	384.51	1515.00	1844.00	1892.00	1899.51
*	16.000	1652.00	586.37	.00	808.82	484.07	1543.00	1610.00	1623.72
*	16.000	1652.00	586.97	.60	520.00	1090.00	1543.00	1610.00	1610.00
	17.100	1752.00	586.38	.00	833.68	1397.10	2748.00	2822.00	2822.97
	17.100	1752.00	586.98	.60	562.00	2260.00	2748.00	2822.00	2822.00
*	17.200	1892.00	586.42	.00	1218.77	1455.40	2580.81	2680.79	2674.17
*	17.200	1892.00	586.99	.57	410.02	2265.22	2580.81	2680.79	2675.24
	17.300	1926.00	586.45	.00	1225.84	1448.40	2580.81	2680.79	2674.23
	17.300	1926.00	587.02	.57	414.86	2260.44	2580.81	2680.79	2675.29
	17.400	2109.00	586.57	.00	1241.11	1843.15	3000.00	3094.00	3084.26
	17.400	2109.00	587.20	.63	1035.49	2050.00	3000.00	3094.00	3085.49

SUMMARY OF ERRORS AND SPECIAL NOTES

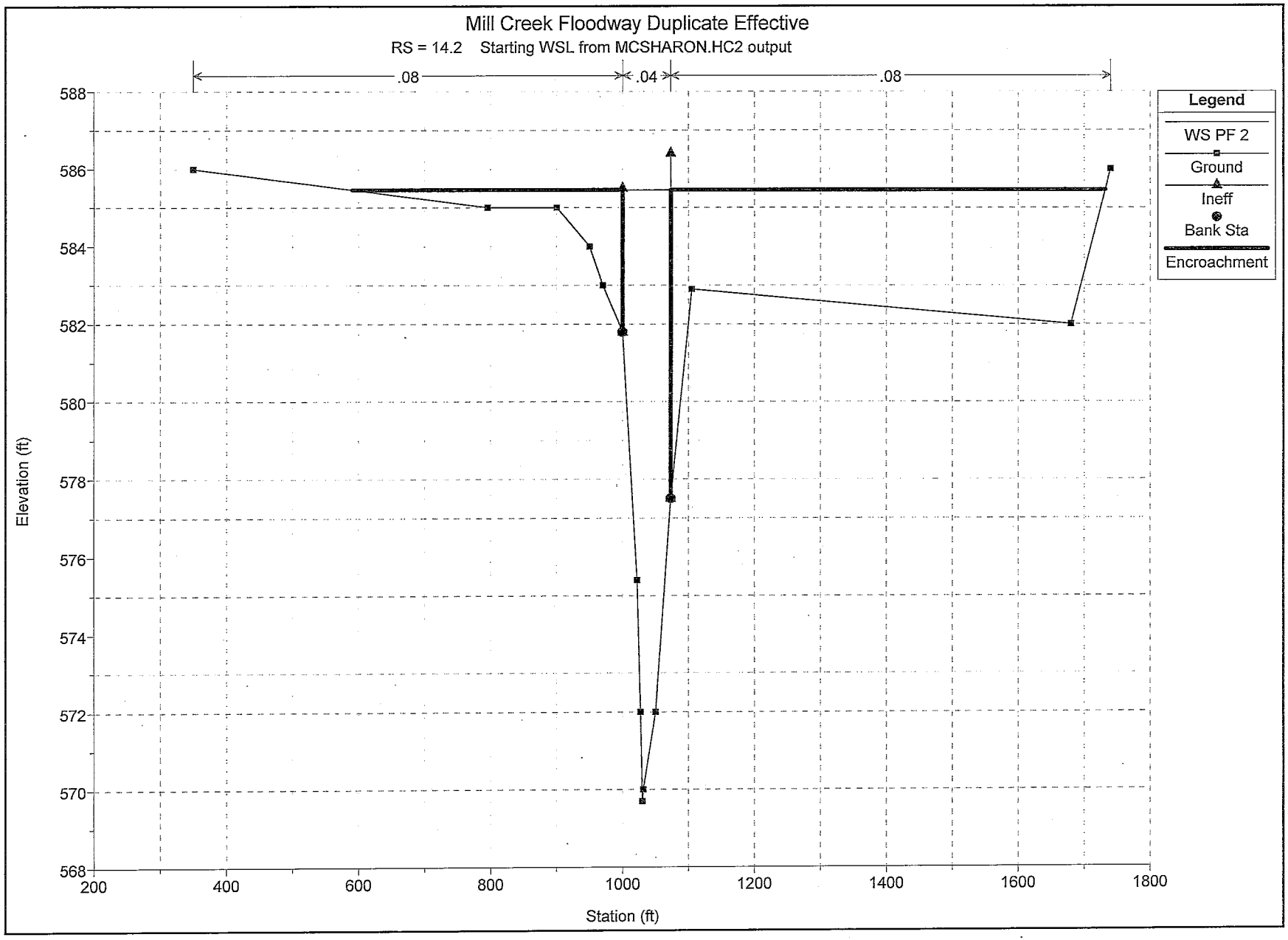
```
WARNING SECNO=     14.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     14.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     15.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     15.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     15.500  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     15.500  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     16.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     16.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     17.200  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     17.200  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

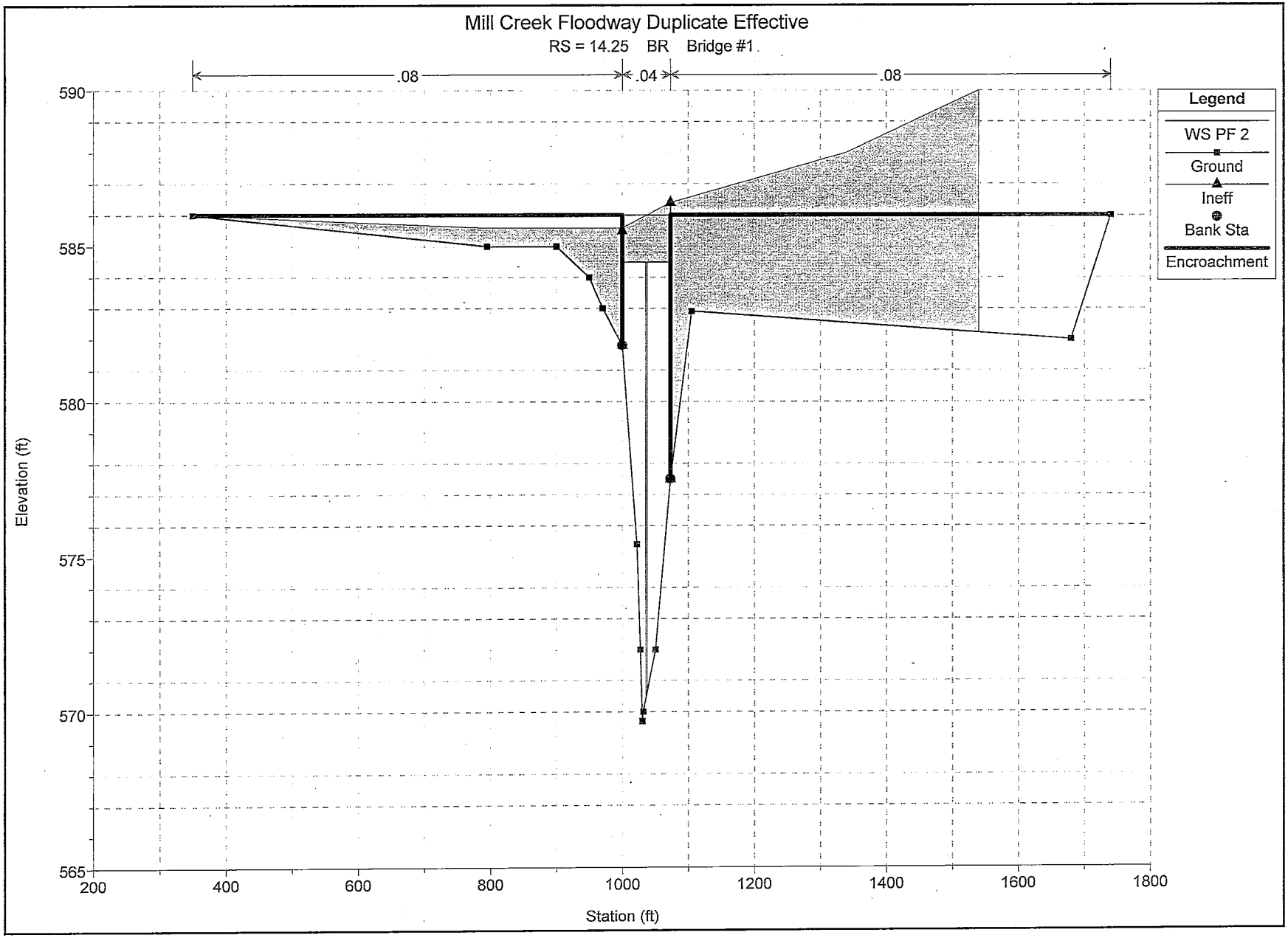
Floodway width summary: MILL CREEK
Profile No. 2

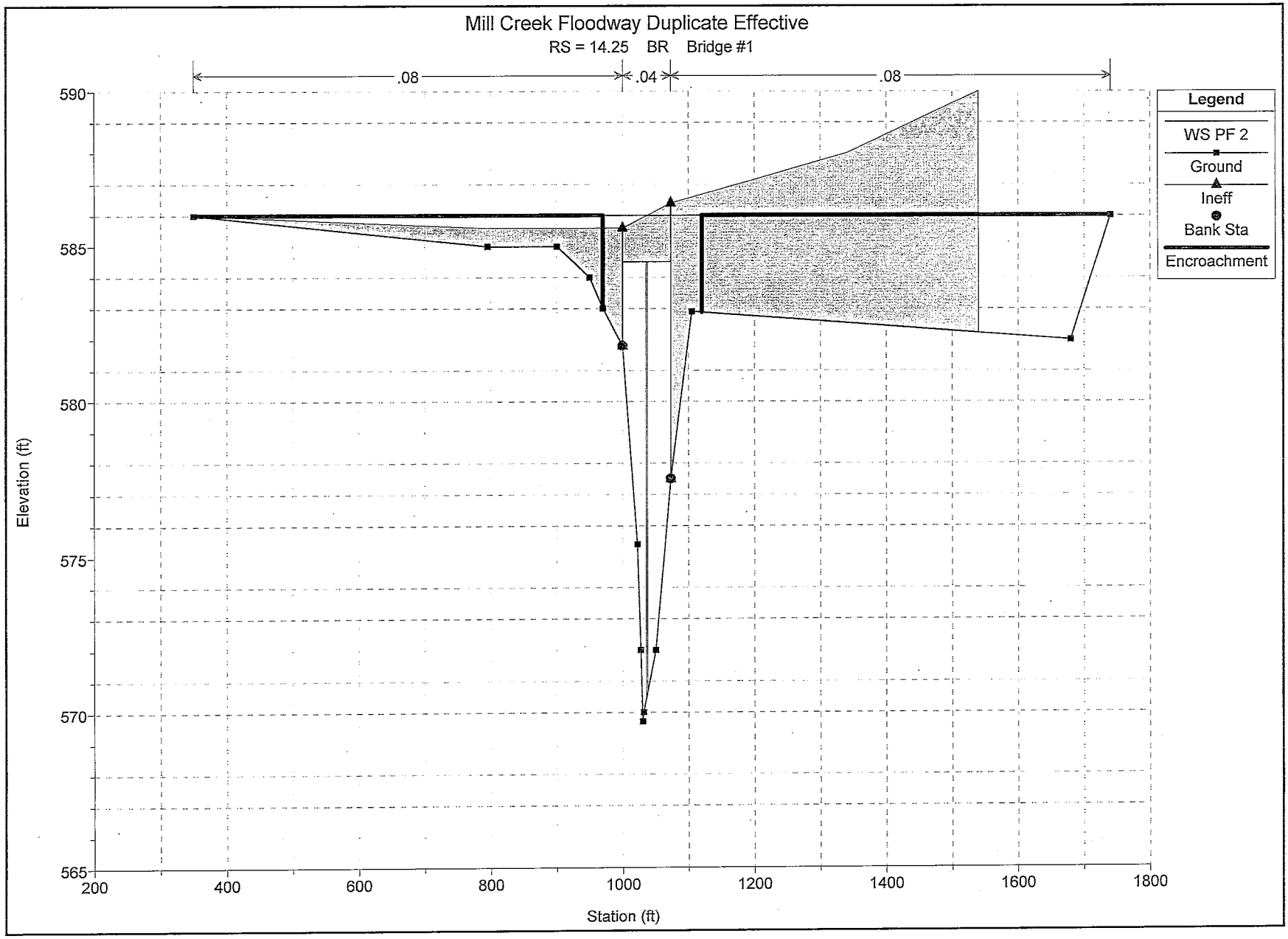
Section Number	Elevation Increase	Top Width	Left Encroach Station	Left Sta Distance From Center	Center Station	Right Sta Distance From Center	Right Encroach Station
14.200	1.00	73.00	1000.00	36.50	1036.50	36.50	1073.00
14.300	.78	150.00	970.00	66.50	1036.50	83.50	1120.00
14.400	.61	600.00	1800.00	233.50	2033.50	366.50	2400.00
15.000	.61	360.00	770.00	255.00	1025.00	105.00	1130.00
15.500	.62	412.00	1515.00	353.00	1868.00	59.00	1927.00
16.000	.60	520.00	1090.00	486.50	1576.50	33.50	1610.00
17.100	.60	562.00	2260.00	525.00	2785.00	37.00	2822.00
17.200	.57	415.57	2265.22	365.58	2630.80	49.99	2680.79
17.300	.57	420.36	2260.44	370.36	2630.80	49.99	2680.79
17.400	.63	1040.00	2050.00	997.00	3047.00	43.00	3090.00

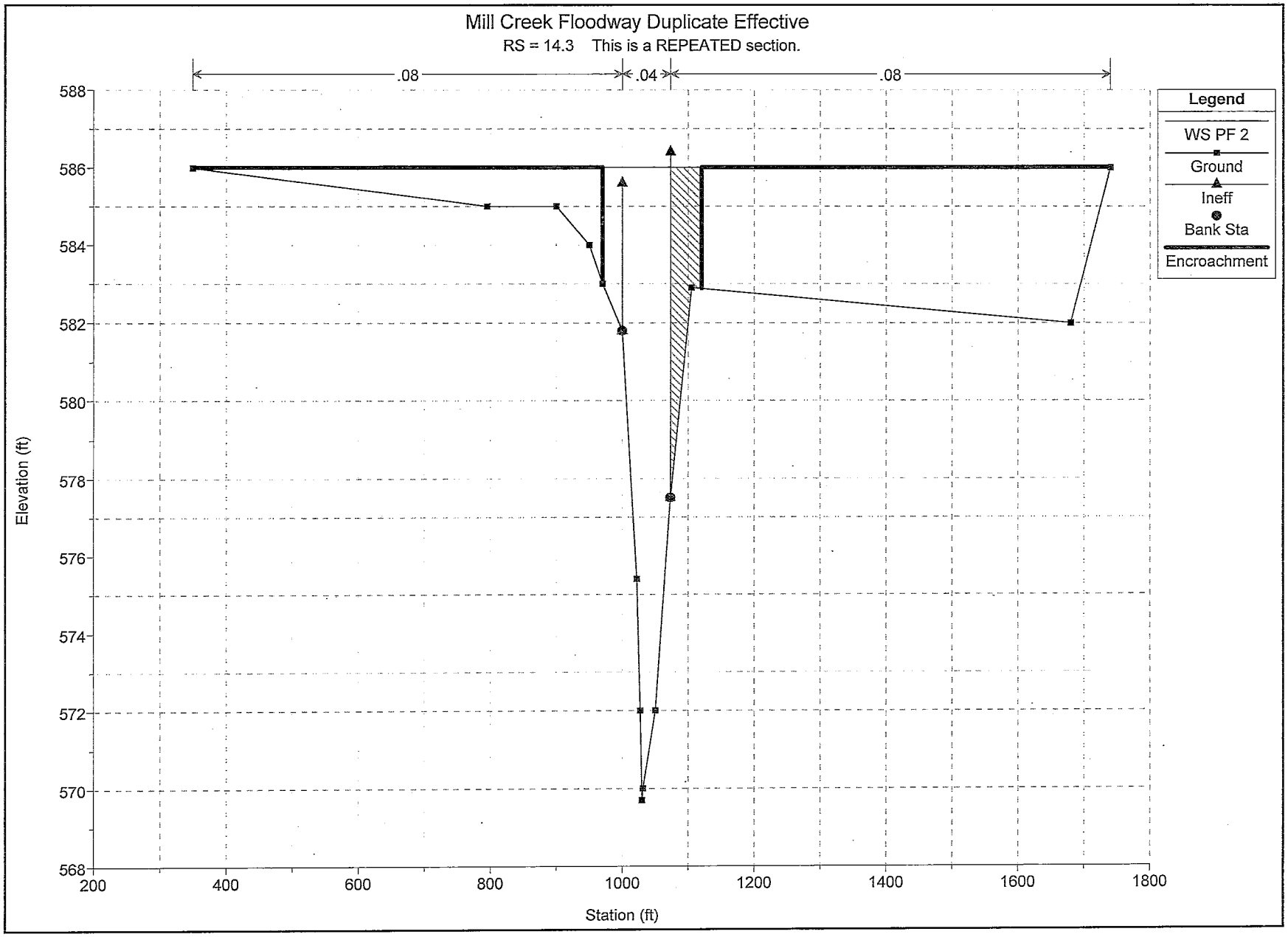
FLOODWAY DATA, MILL CREEK
PROFILE NO. 2

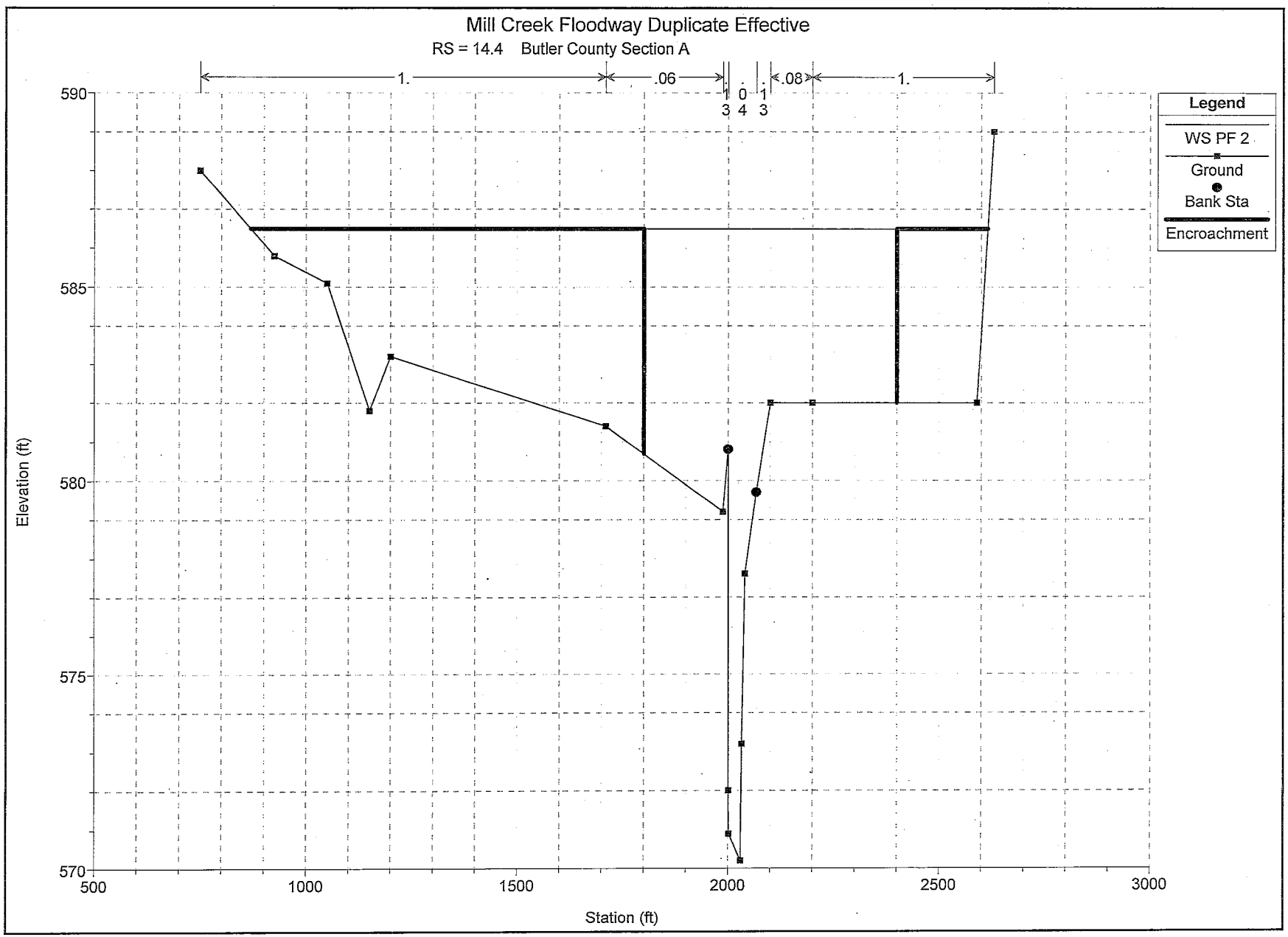
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
14.200	73.	791.	5.6	585.5	584.5	1.0
14.300	103.	920.	4.9	585.8	585.0	.8
14.400	600.	3550.	1.3	586.3	585.7	.6
15.000	360.	1873.	2.4	586.6	586.0	.6
15.500	385.	2702.	1.7	586.9	586.3	.6
16.000	520.	4637.	1.0	587.0	586.4	.6
17.100	562.	4454.	1.0	587.0	586.4	.6
17.200	410.	2417.	1.8	587.0	586.4	.6
17.300	415.	2446.	1.8	587.0	586.4	.6
17.400	1035.	4087.	1.1	587.2	586.6	.6

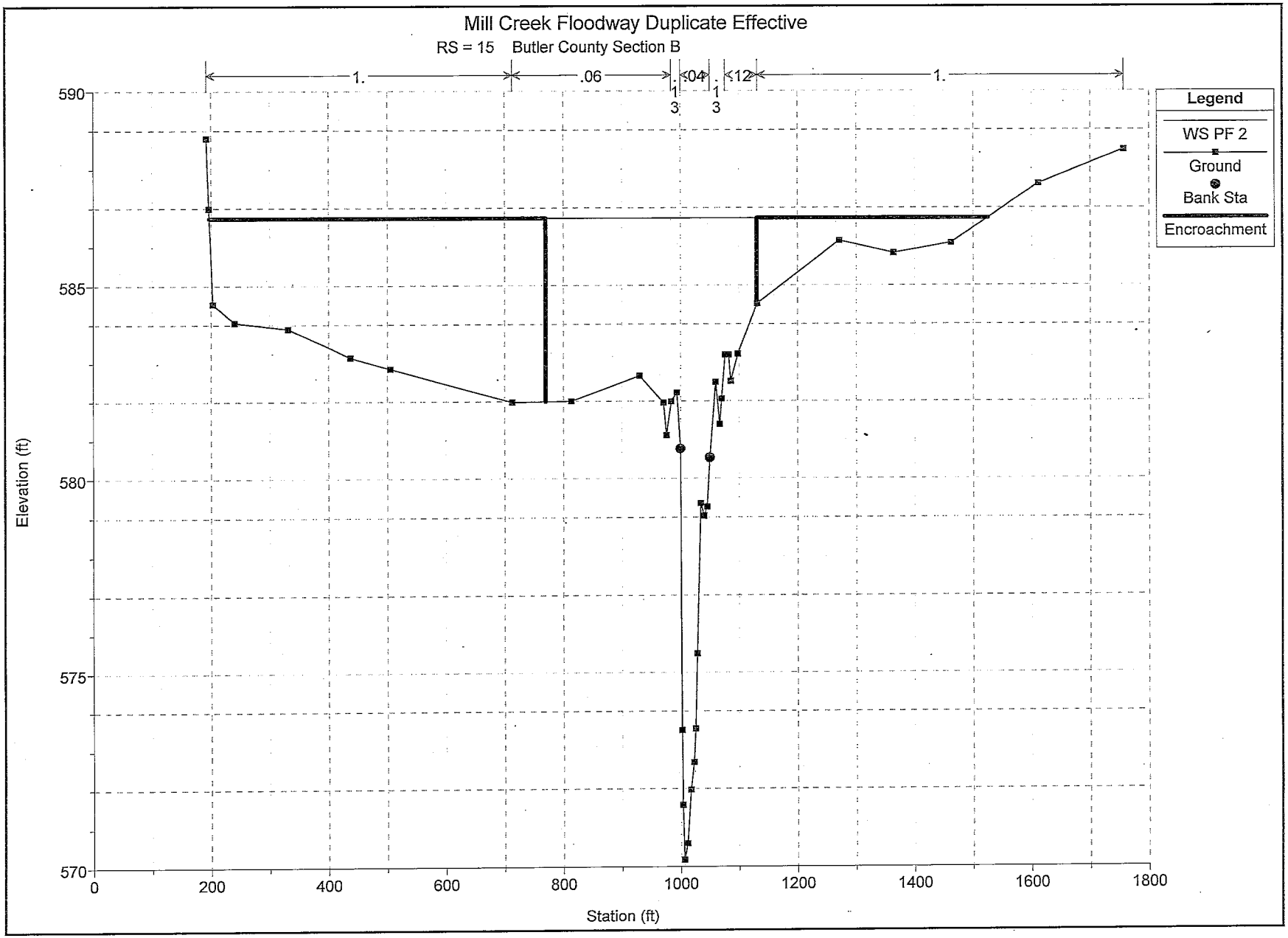

Mill Creek Floodway Duplicate Effective
RS = 14.2 Starting WSL from MCSHARON.HC2 output
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
588
586
584
582
580
578
576
574
572
570
568
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

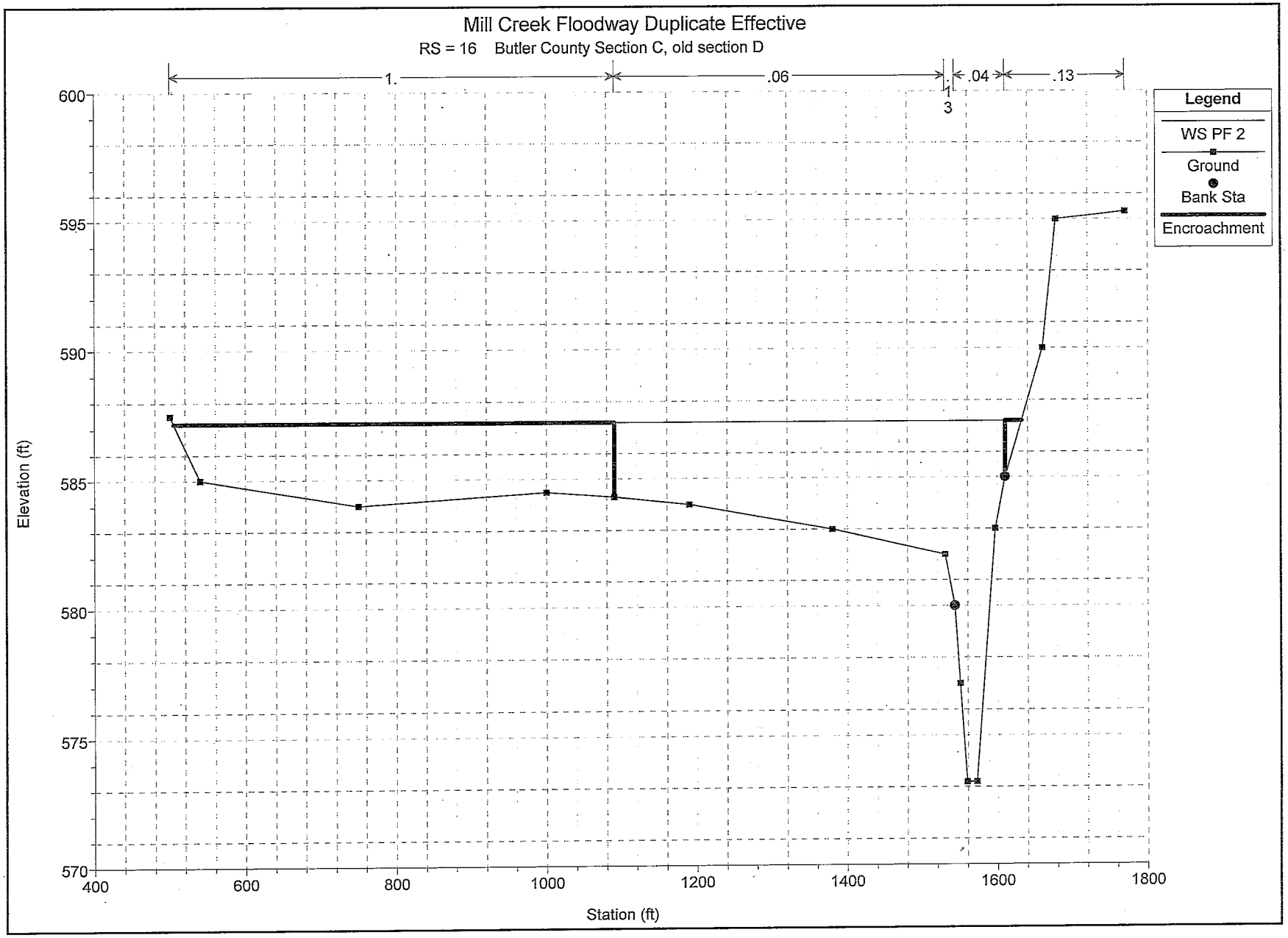

Mill Creek Floodway Duplicate Effective
RS = 14.25 BR Bridge #1
.08
.04
.08
590
585
580
575
570
565
Elevation (ft)
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment

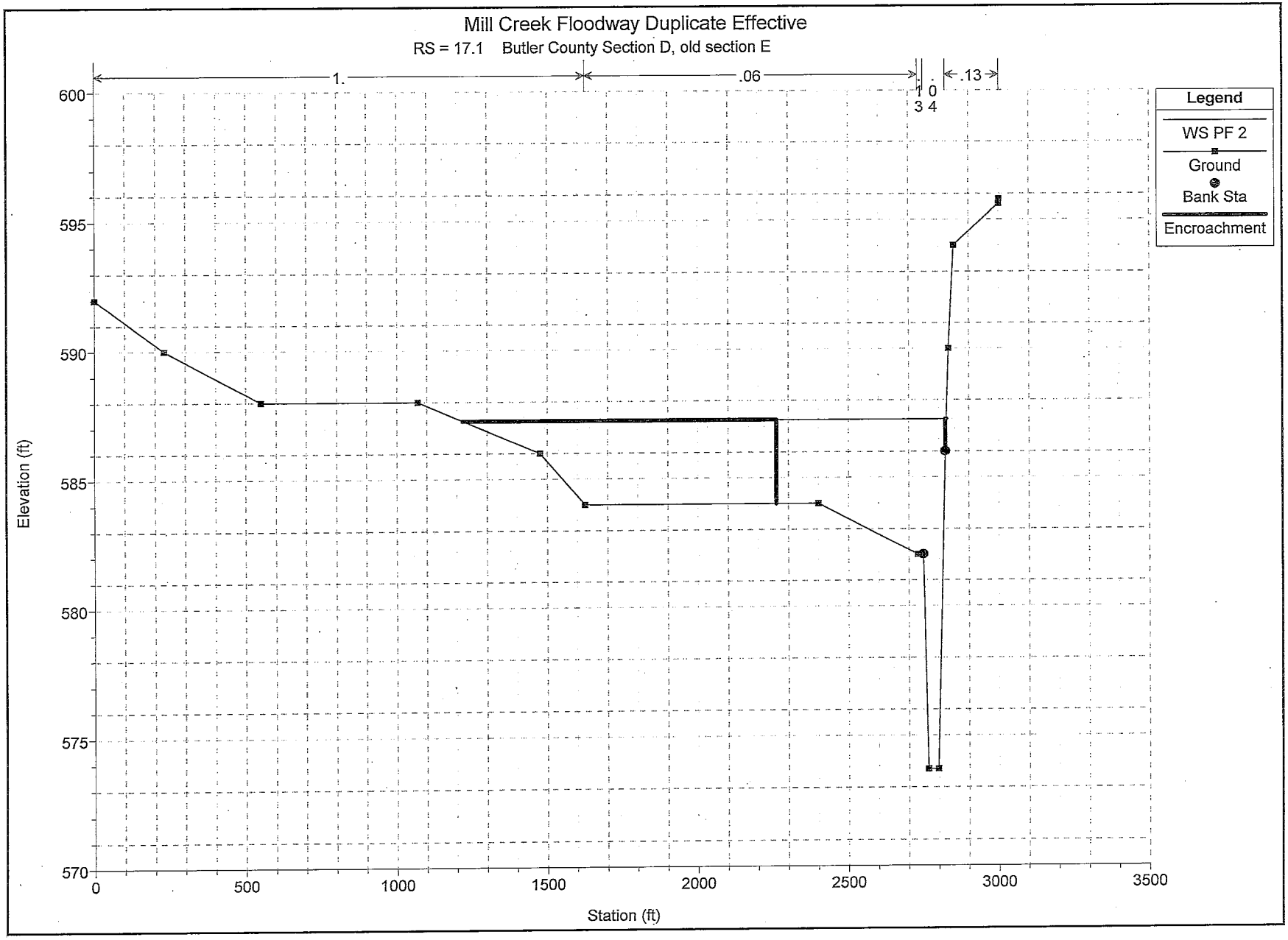

Mill Creek Floodway Duplicate Effective
RS = 14.25 BR Bridge #1
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
590
585
580
575
570
565
Elevation (ft)
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

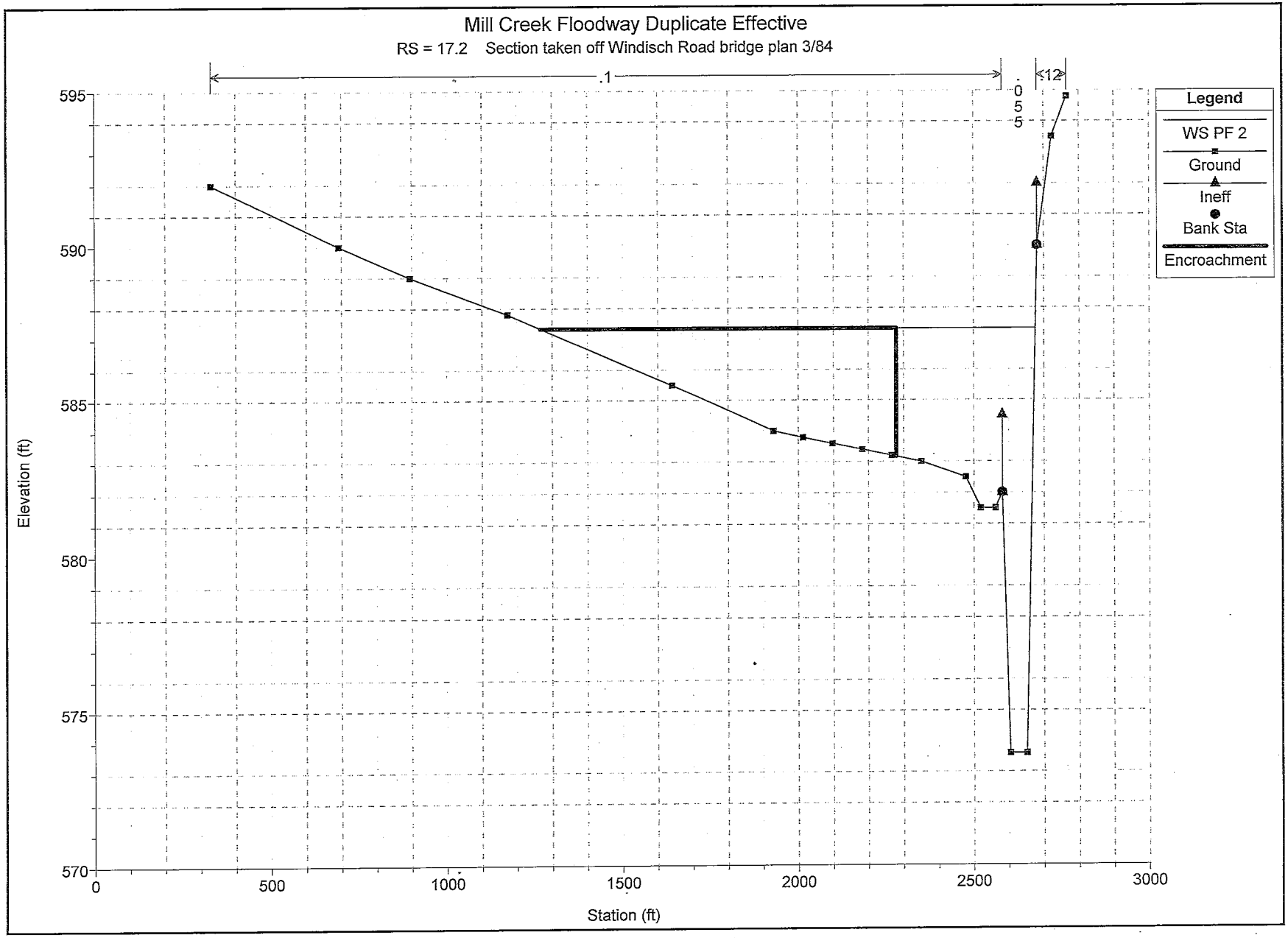

Mill Creek Floodway Duplicate Effective
RS = 14.3 This is a REPEATED section.
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
588
586
584
582
580
578
576
574
572
570
568
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

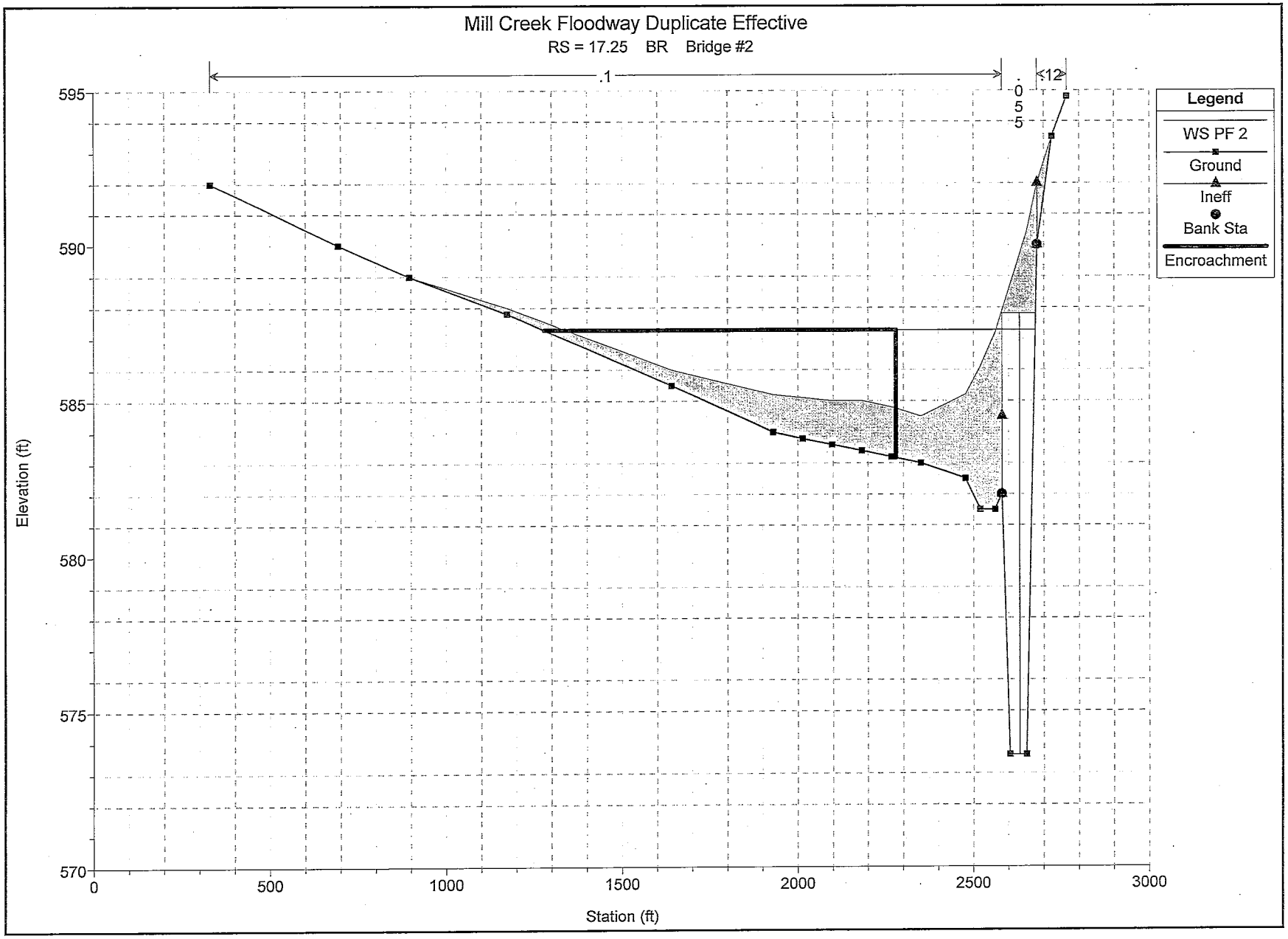

Mill Creek Floodway Duplicate Effective
RS = 14.4 Butler County Section A
1.
.06
.08
1.
0
1
3
4
3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
590
585
580
575
570
Elevation (ft)
500
1000
1500
2000
2500
3000
Station (ft)

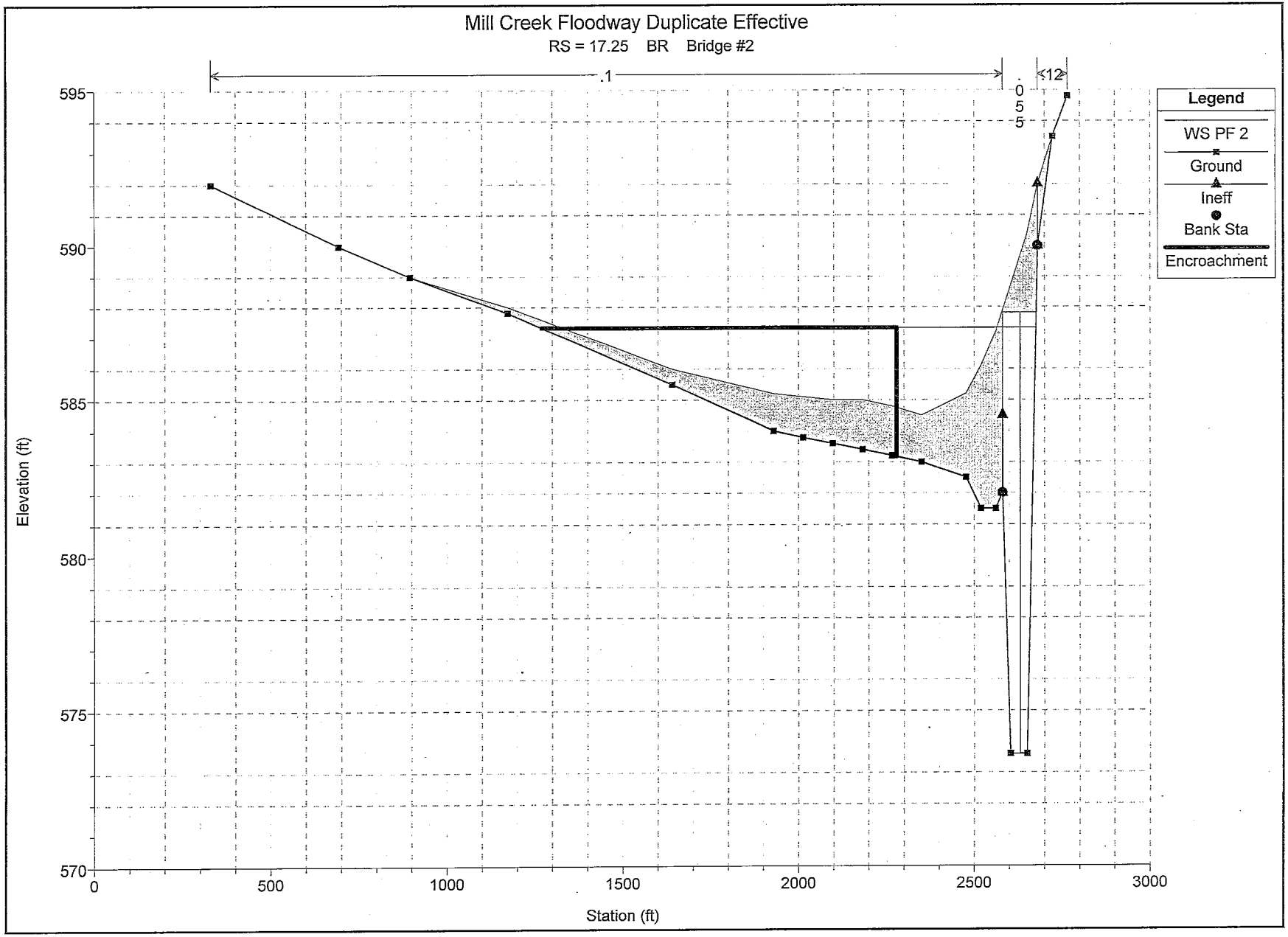

Mill Creek Floodway Duplicate Effective
RS = 15 Butler County Section B
1.
.06
.04
.12
1.
1
3
1
3
590
585
580
575
570
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 2
Ground
Bank Sta
Encroachment

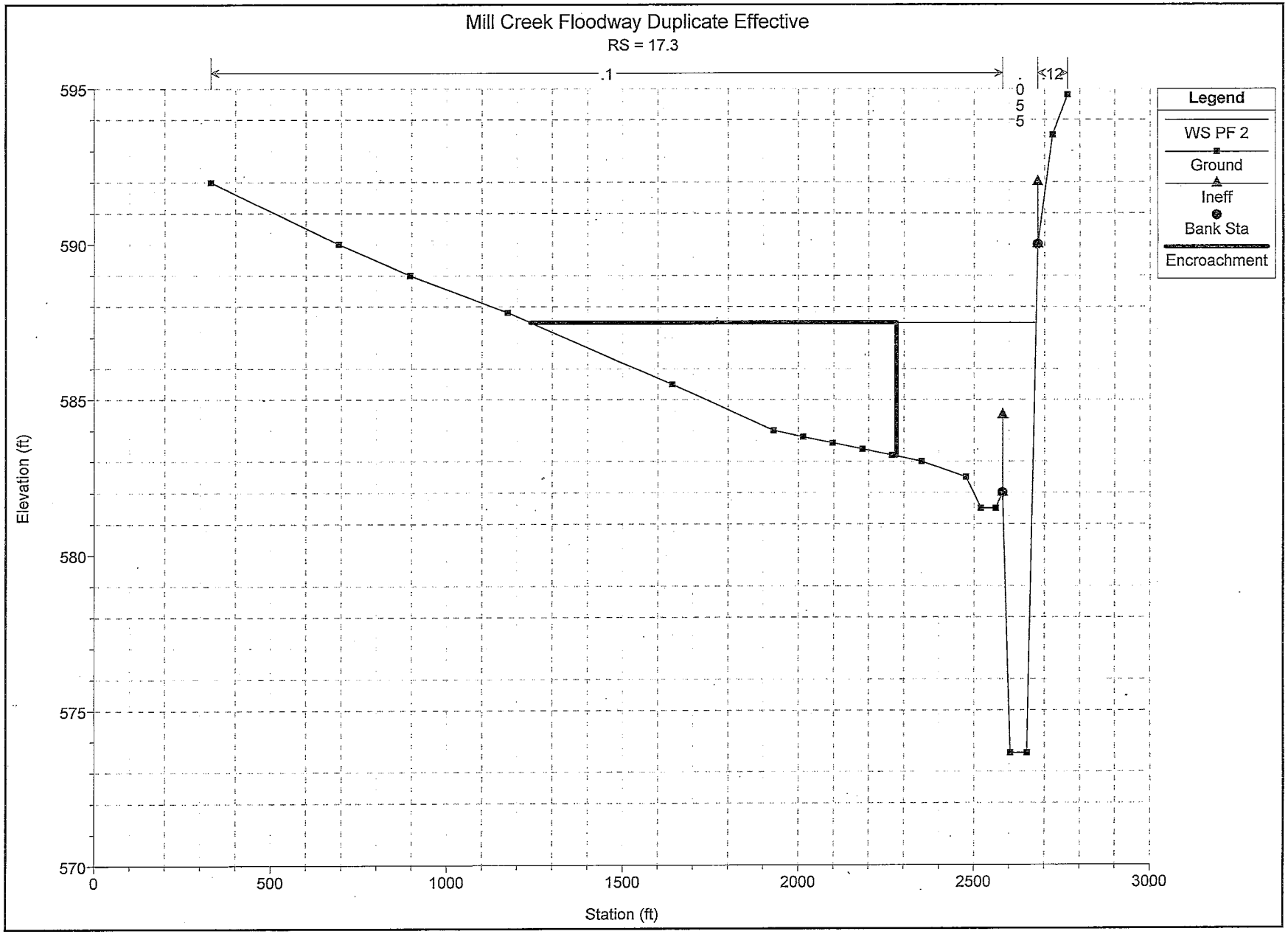

Mill Creek Floodway Duplicate Effective
RS = 16 Butler County Section C, old section D
1.
.06
.04
.13
1
3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
400
600
800
1000
1200
1400
1600
1800
Station (ft)

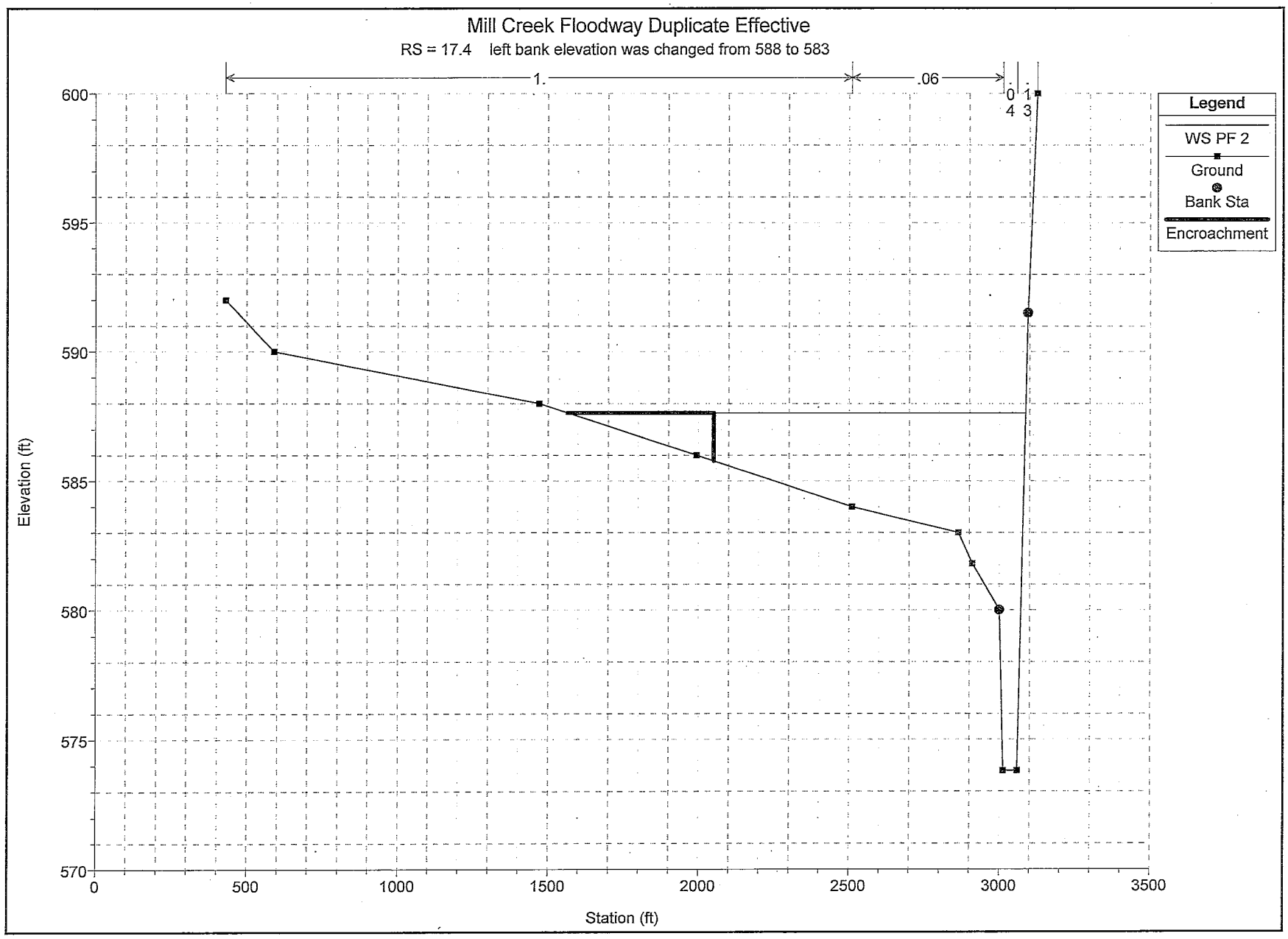

Mill Creek Floodway Duplicate Effective
RS = 17.1 Butler County Section D, old section E
1.
.06
.13
.
1 0
3 4
Legend
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

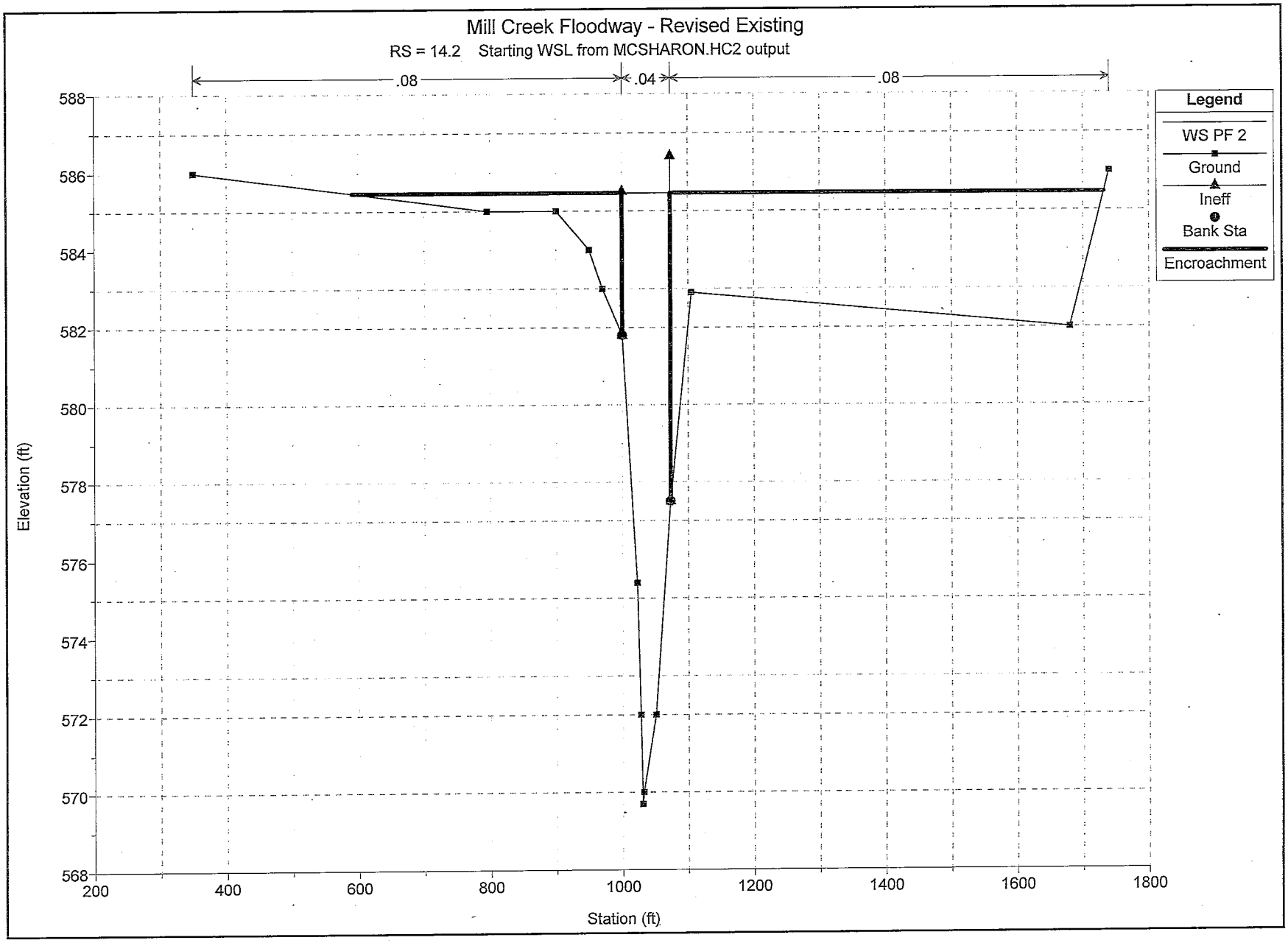

Mill Creek Floodway Duplicate Effective
RS = 17.2 Section taken off Windisch Road bridge plan 3/84
.1
.055
.12
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
Station (ft)

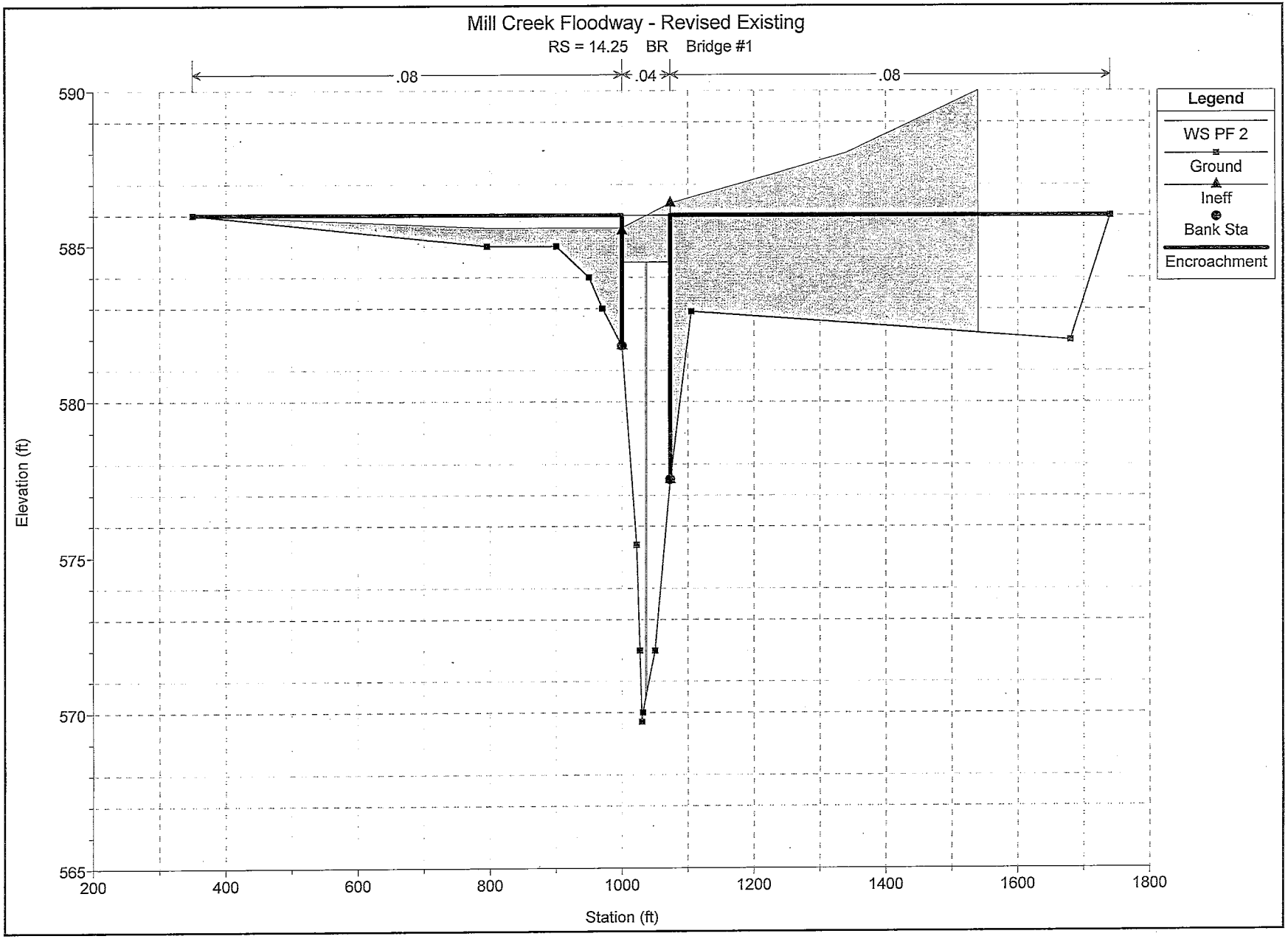

Mill Creek Floodway Duplicate Effective
RS = 17.25 BR Bridge #2
.1
.12
0
5
5
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
595
590
585
580
575
570
Elevation (ft)
0
500
1000
1500
2000
2500
3000
Station (ft)

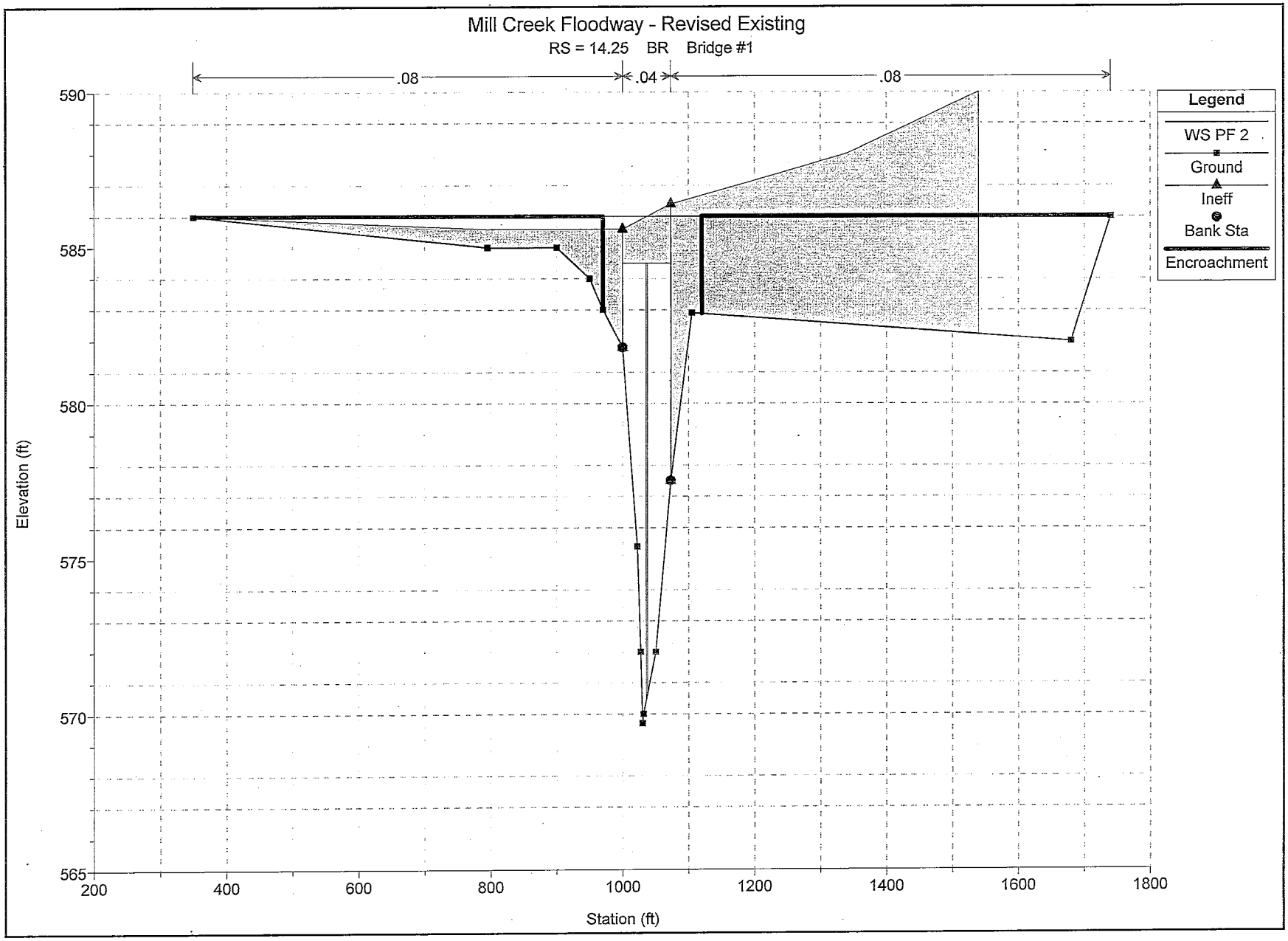

Mill Creek Floodway Duplicate Effective
RS = 17.25 BR Bridge #2
.1
.12
0
5
5
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
595
590
585
580
575
570
Elevation (ft)
0
500
1000
1500
2000
2500
3000
Station (ft)

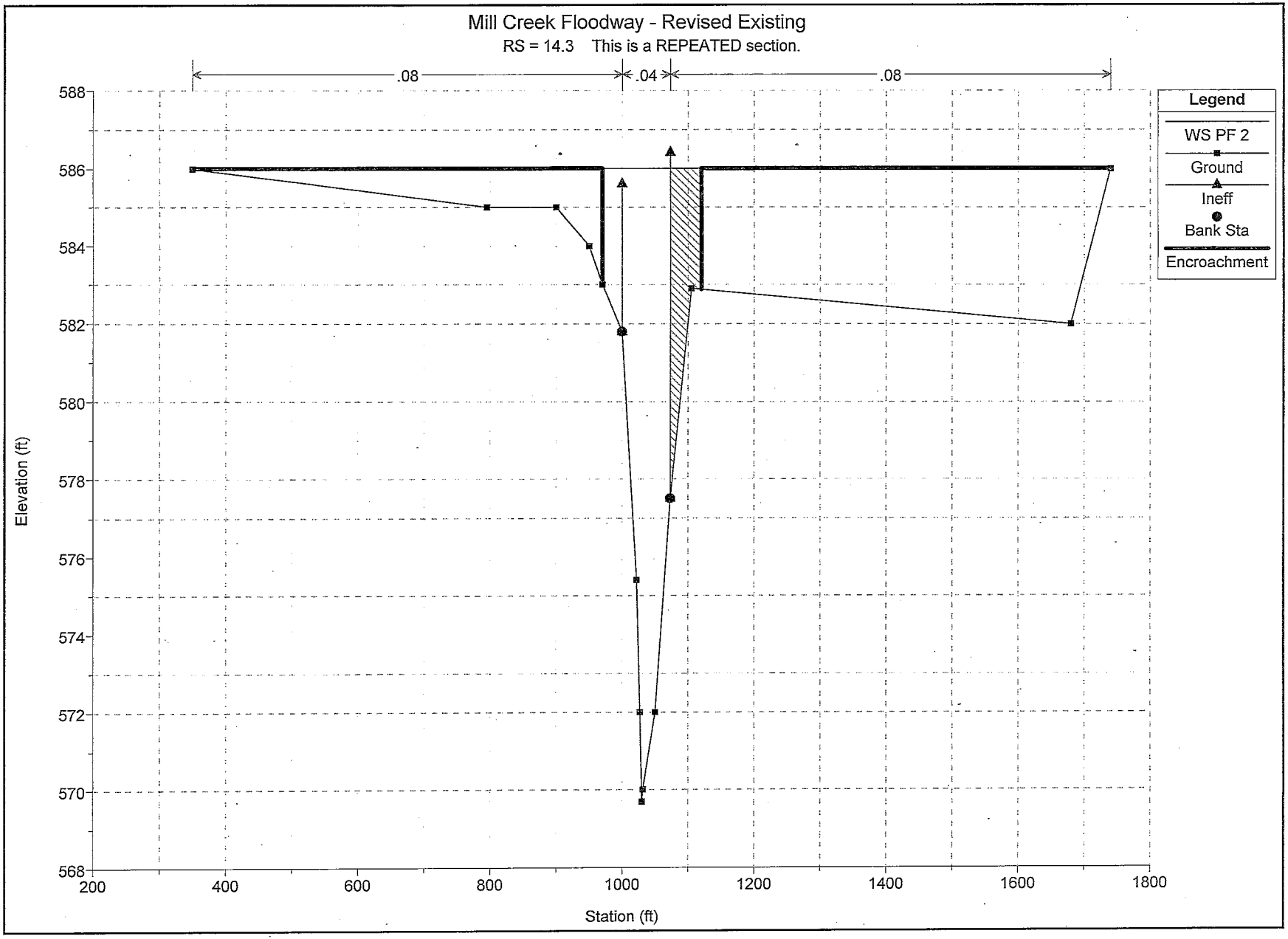

Mill Creek Floodway Duplicate Effective
RS = 17.3
.1
.055
.12
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
Station (ft)

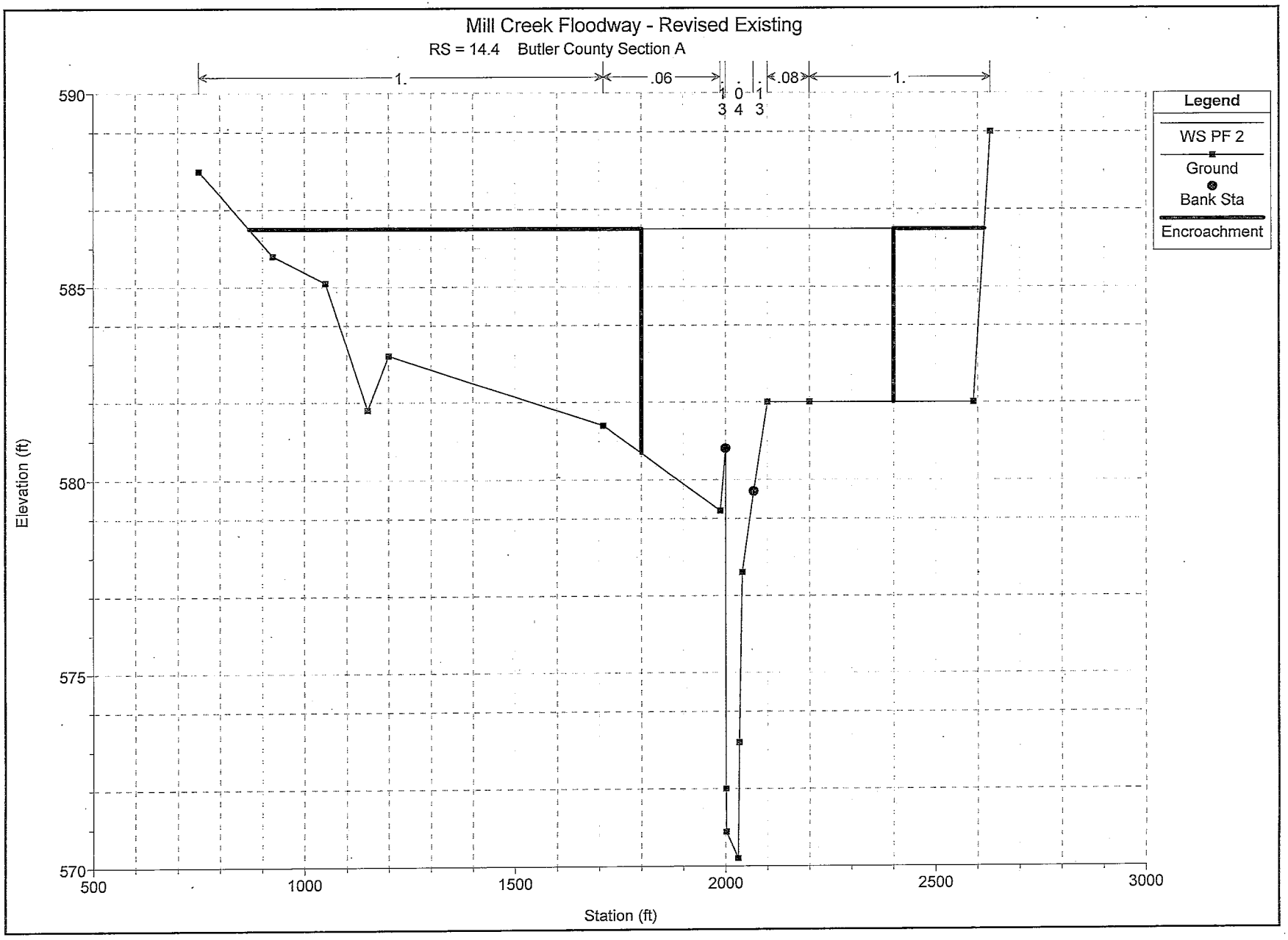

Mill Creek Floodway Duplicate Effective
RS = 17.4 left bank elevation was changed from 588 to 583
1.
.06
0
1
4
3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

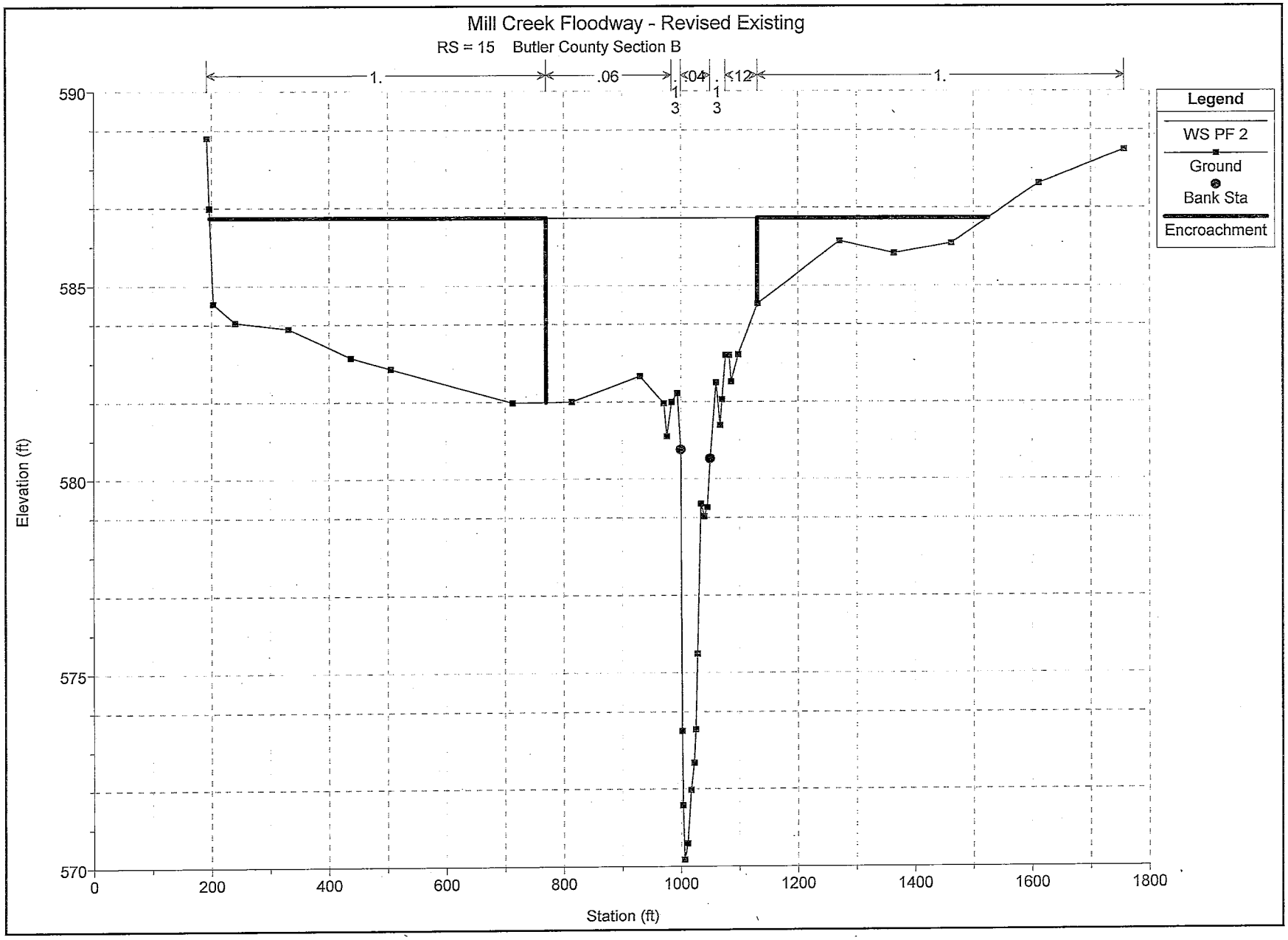

Mill Creek Floodway - Revised Existing
RS = 14.2 Starting WSL from MCSHARON.HC2 output
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
588
586
584
582
580
578
576
574
572
570
568
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

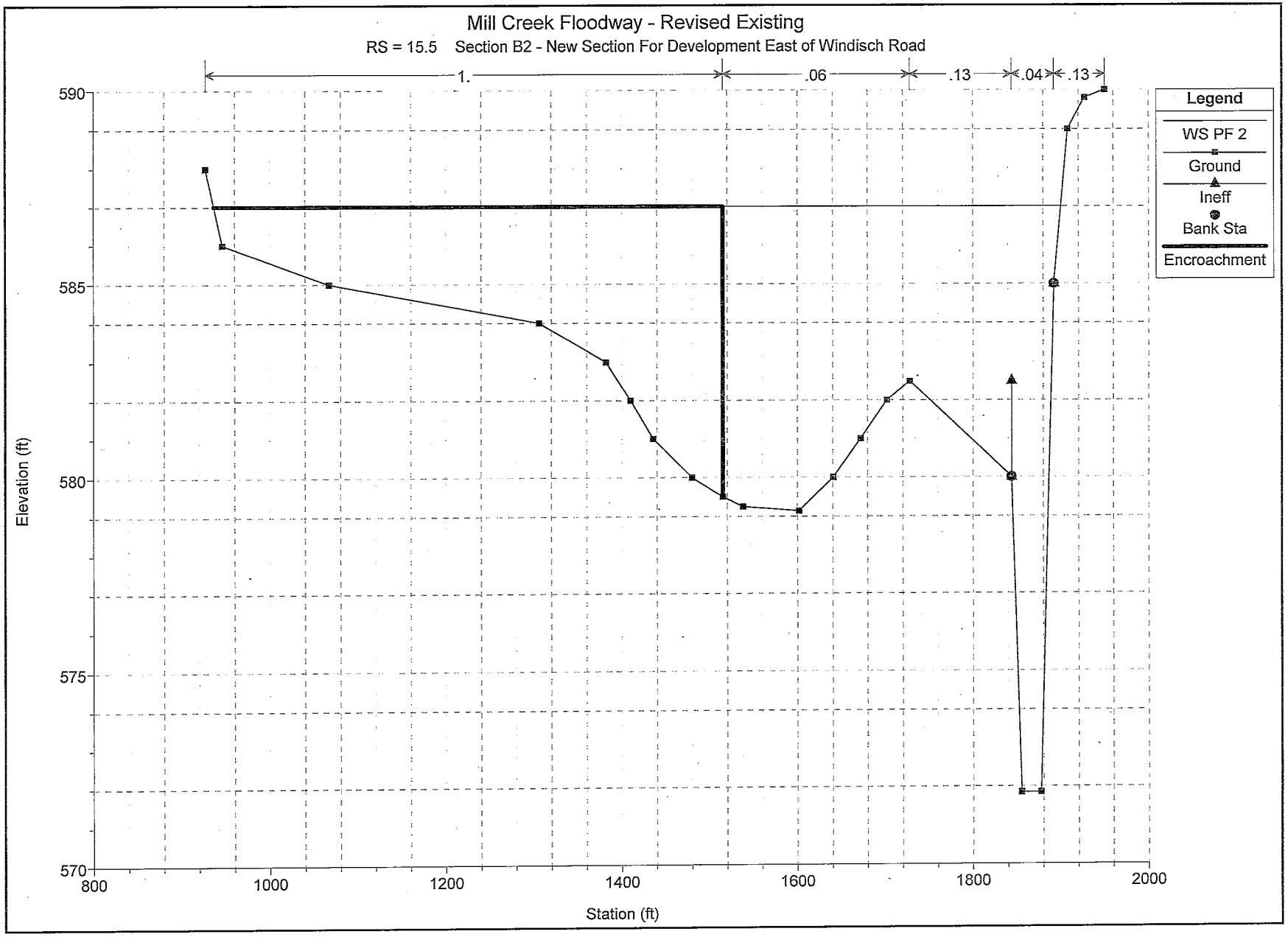

Mill Creek Floodway - Revised Existing
RS = 14.25 BR Bridge #1
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
590
585
580
575
570
565
Elevation (ft)
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

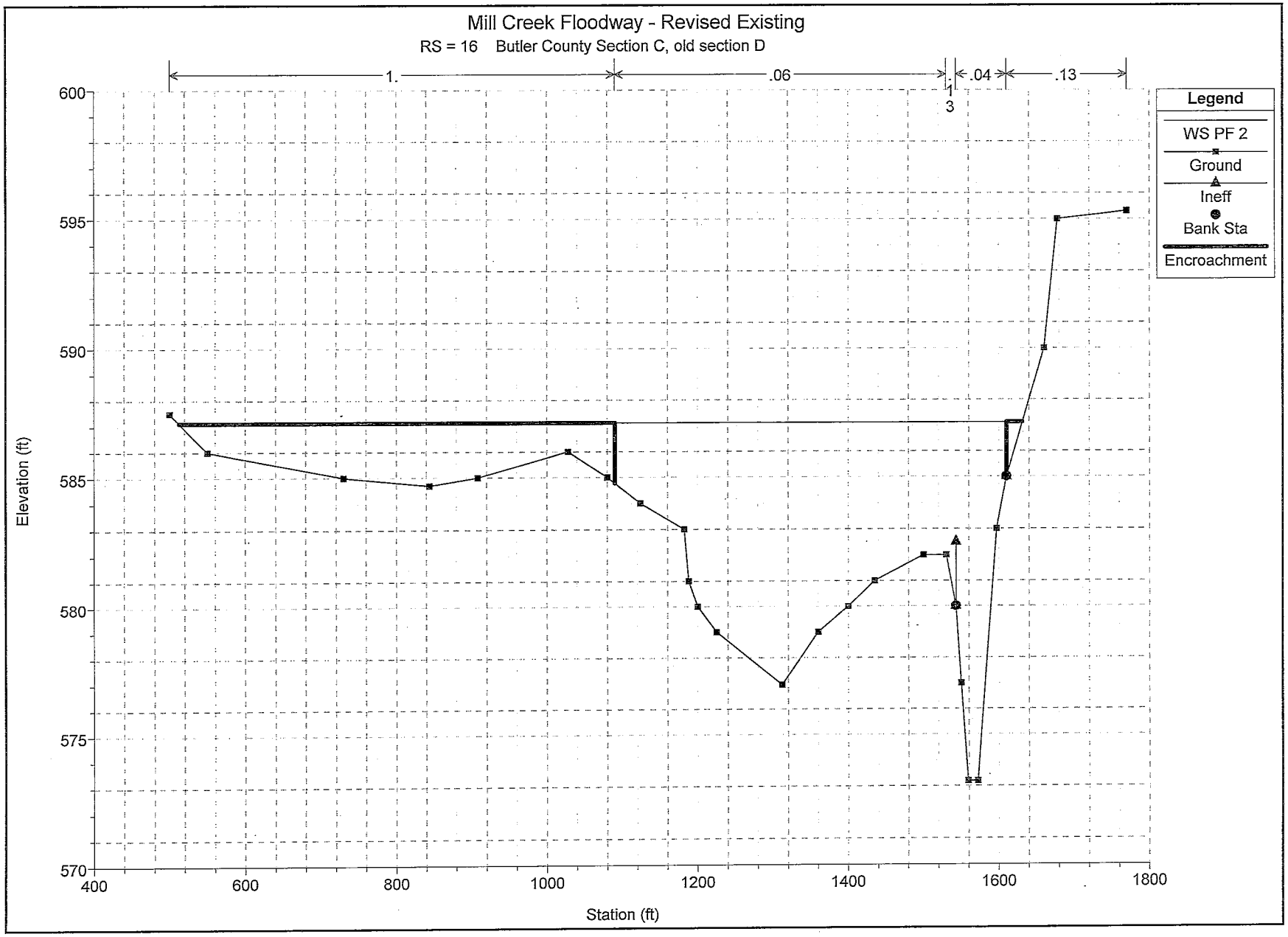

Mill Creek Floodway - Revised Existing
RS = 14.25 BR Bridge #1
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
590
585
580
575
570
565
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

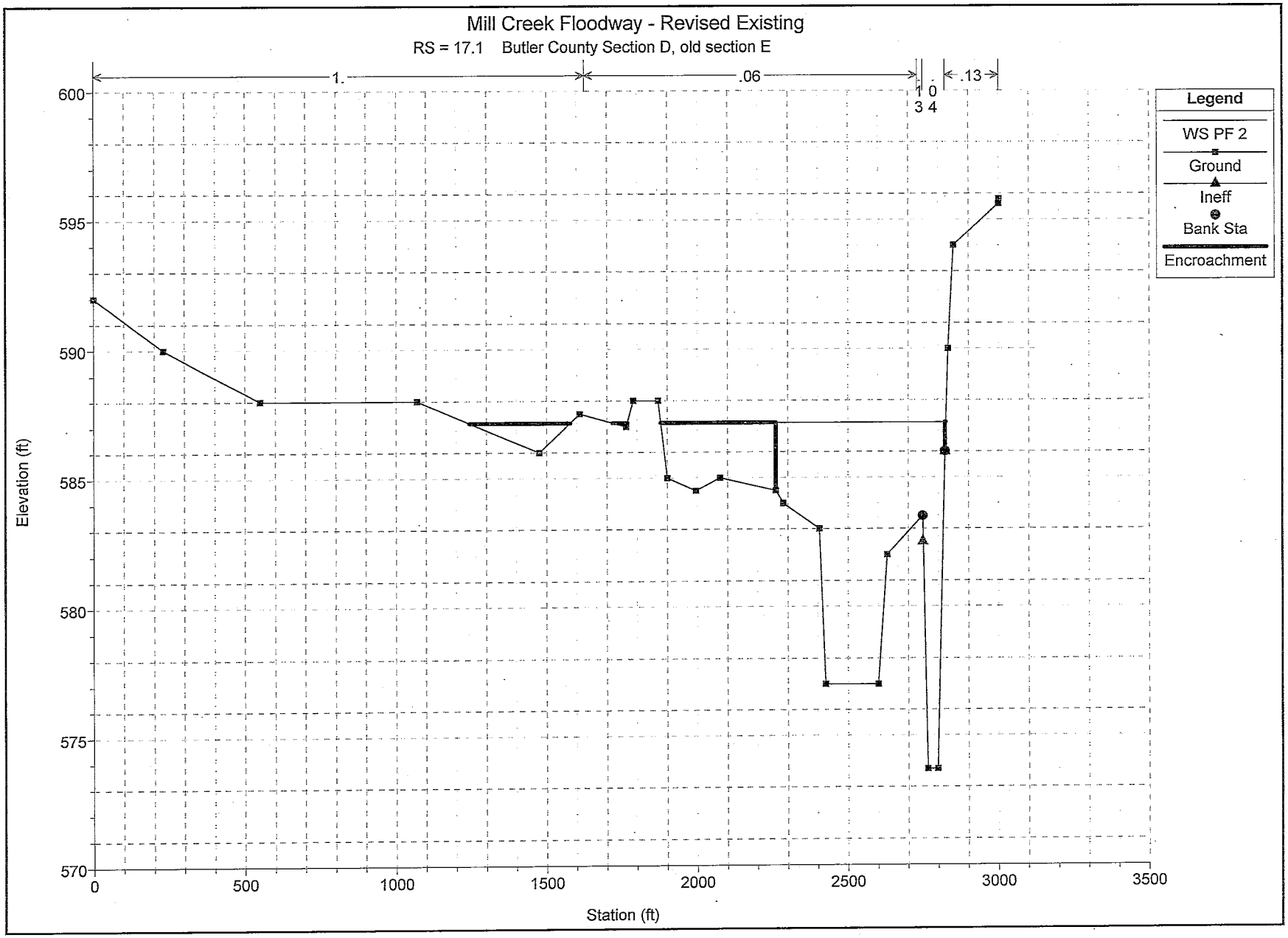

Mill Creek Floodway - Revised Existing
RS = 14.3 This is a REPEATED section.
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
588
586
584
582
580
578
576
574
572
570
568
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

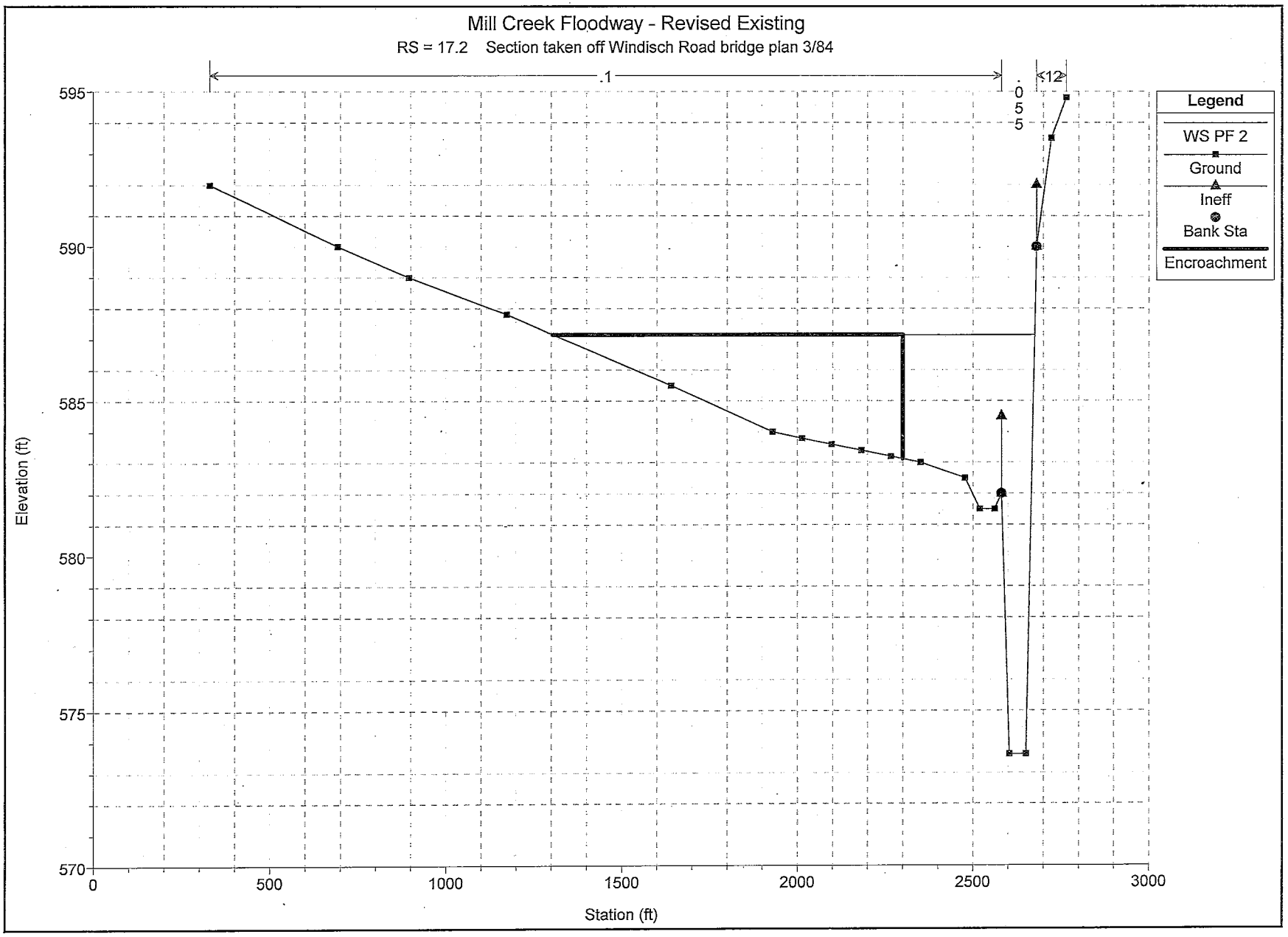

Mill Creek Floodway - Revised Existing
RS = 14.4 Butler County Section A
1.
.06
.08
1.
0
1
3 4 3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
590
585
580
575
570
Elevation (ft)
500
1000
1500
2000
2500
3000
Station (ft)

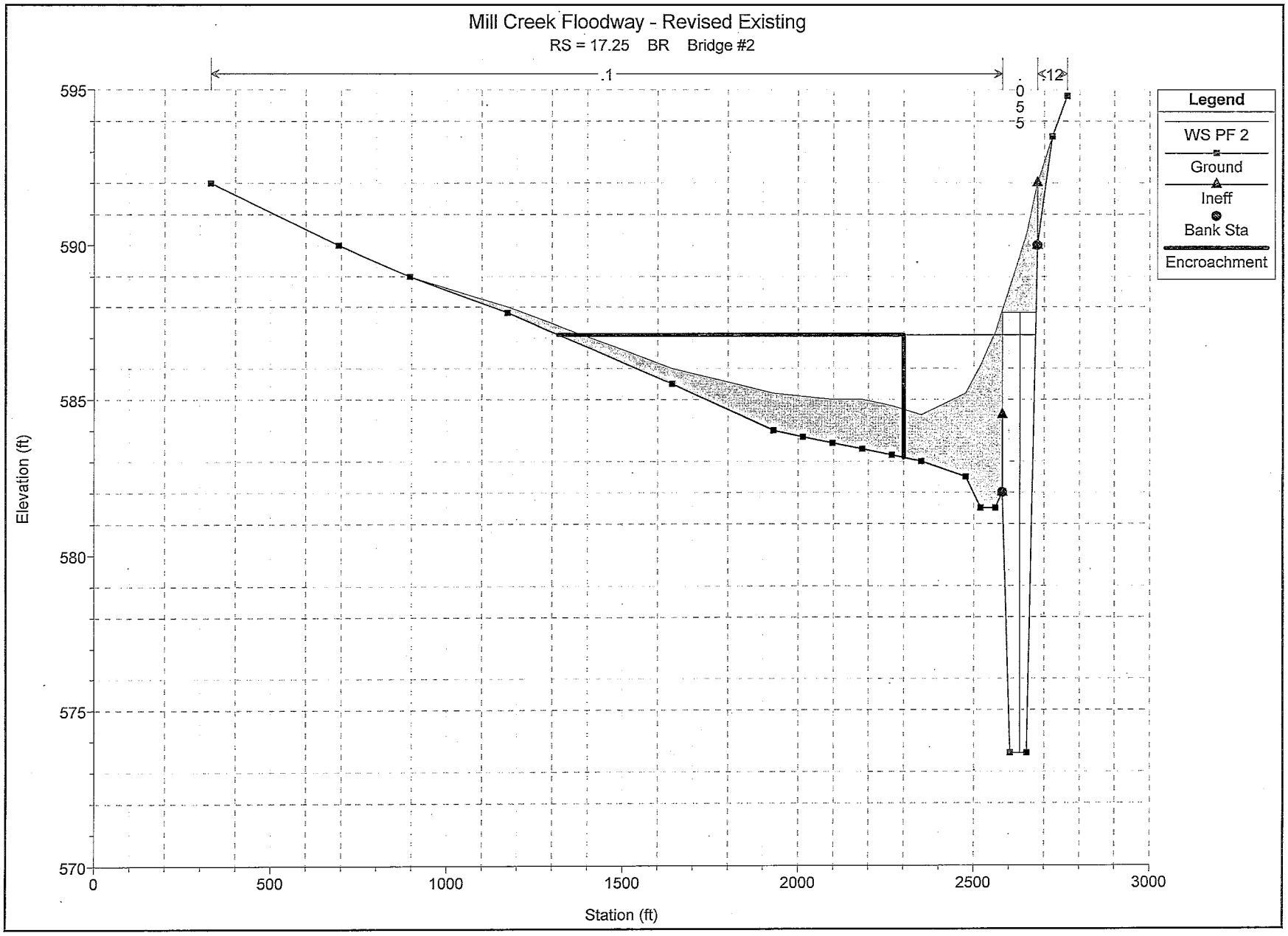

Mill Creek Floodway - Revised Existing
RS = 15 Butler County Section B
1.
.06
.04
.12
1.
1
3
1
3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
590
585
580
575
570
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

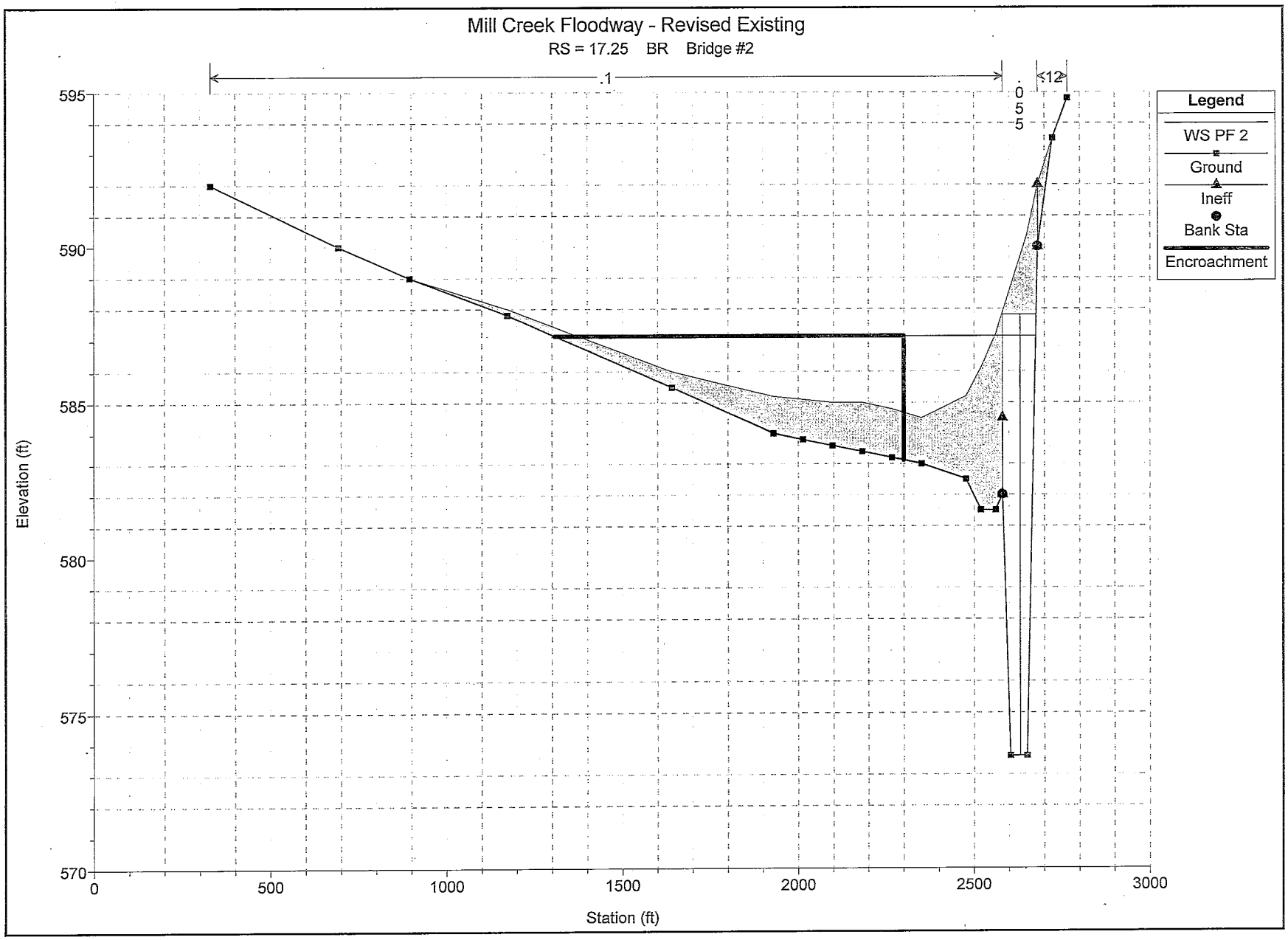

Mill Creek Floodway - Revised Existing
RS = 15.5 Section B2 - New Section For Development East of Windisch Road
1.
.06
.13
.04
.13
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
590
585
580
575
570
Elevation (ft)
800
1000
1200
1400
1600
1800
2000
Station (ft)

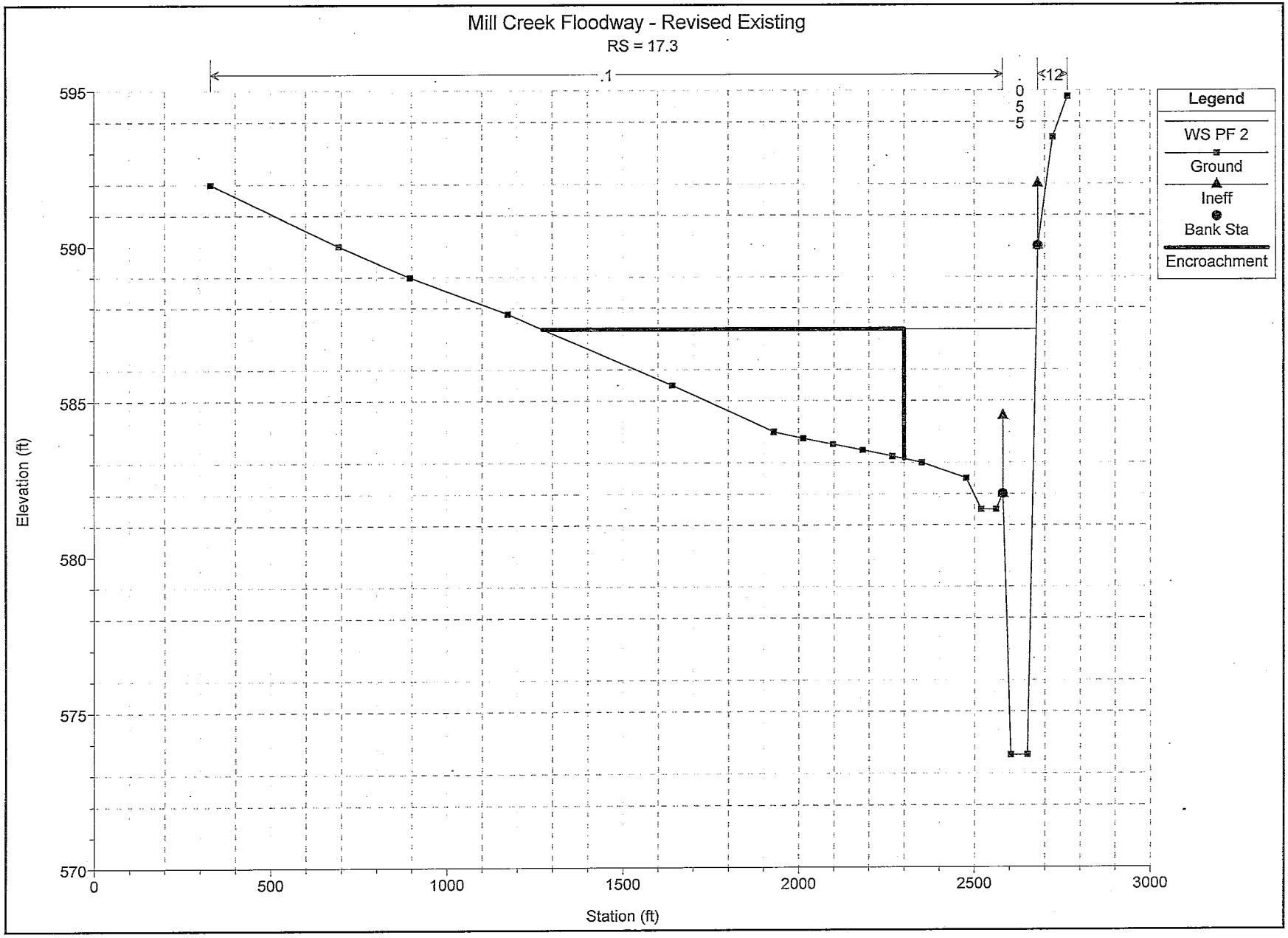

Mill Creek Floodway - Revised Existing
RS = 16 Butler County Section C, old section D
1.
.06
.04
.13
1
3
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
400
600
800
1000
1200
1400
1600
1800
Station (ft)

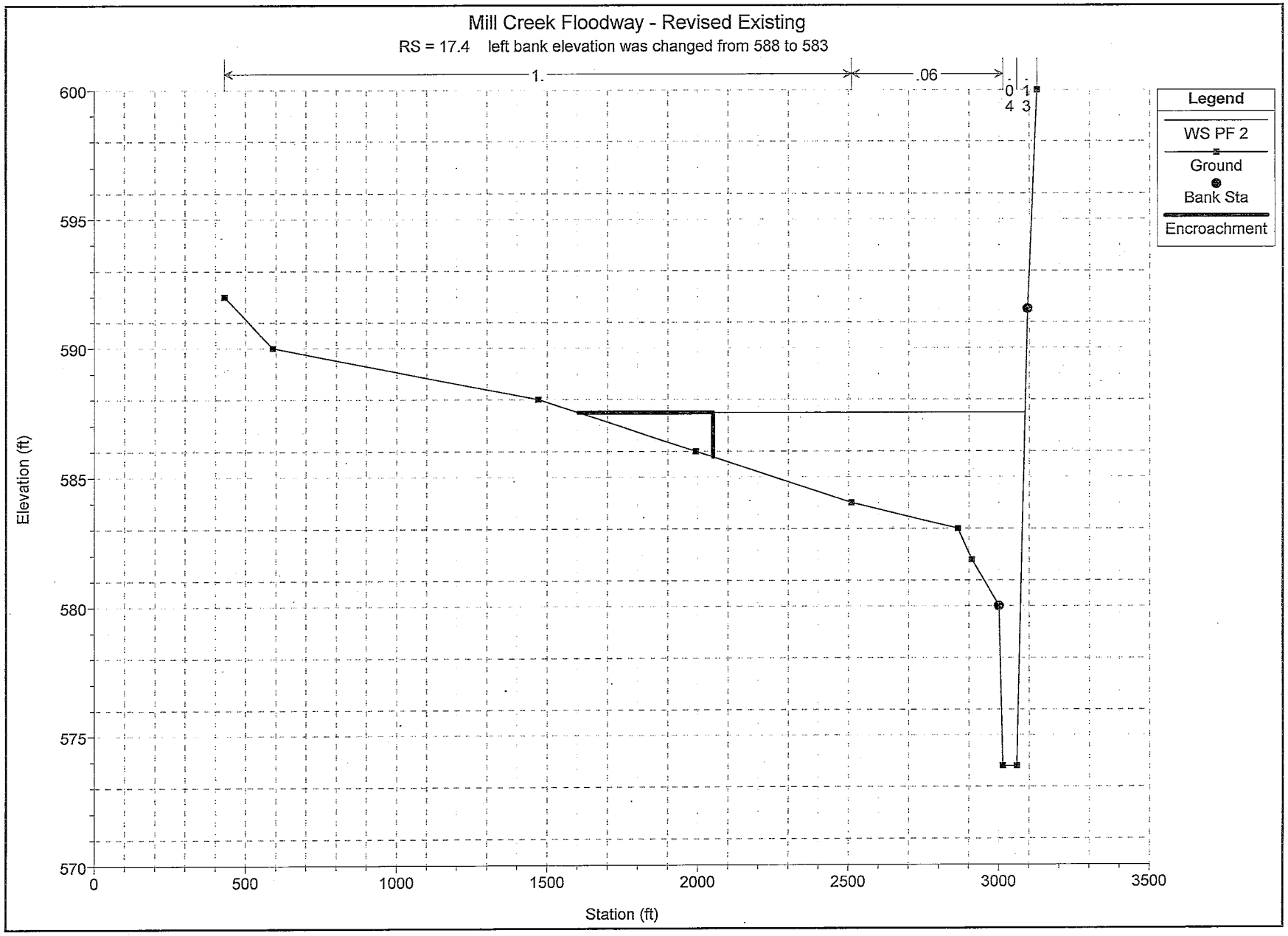

Mill Creek Floodway - Revised Existing
RS = 17.1 Butler County Section D, old section E
1.
.06
.13
1 0
3 4
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

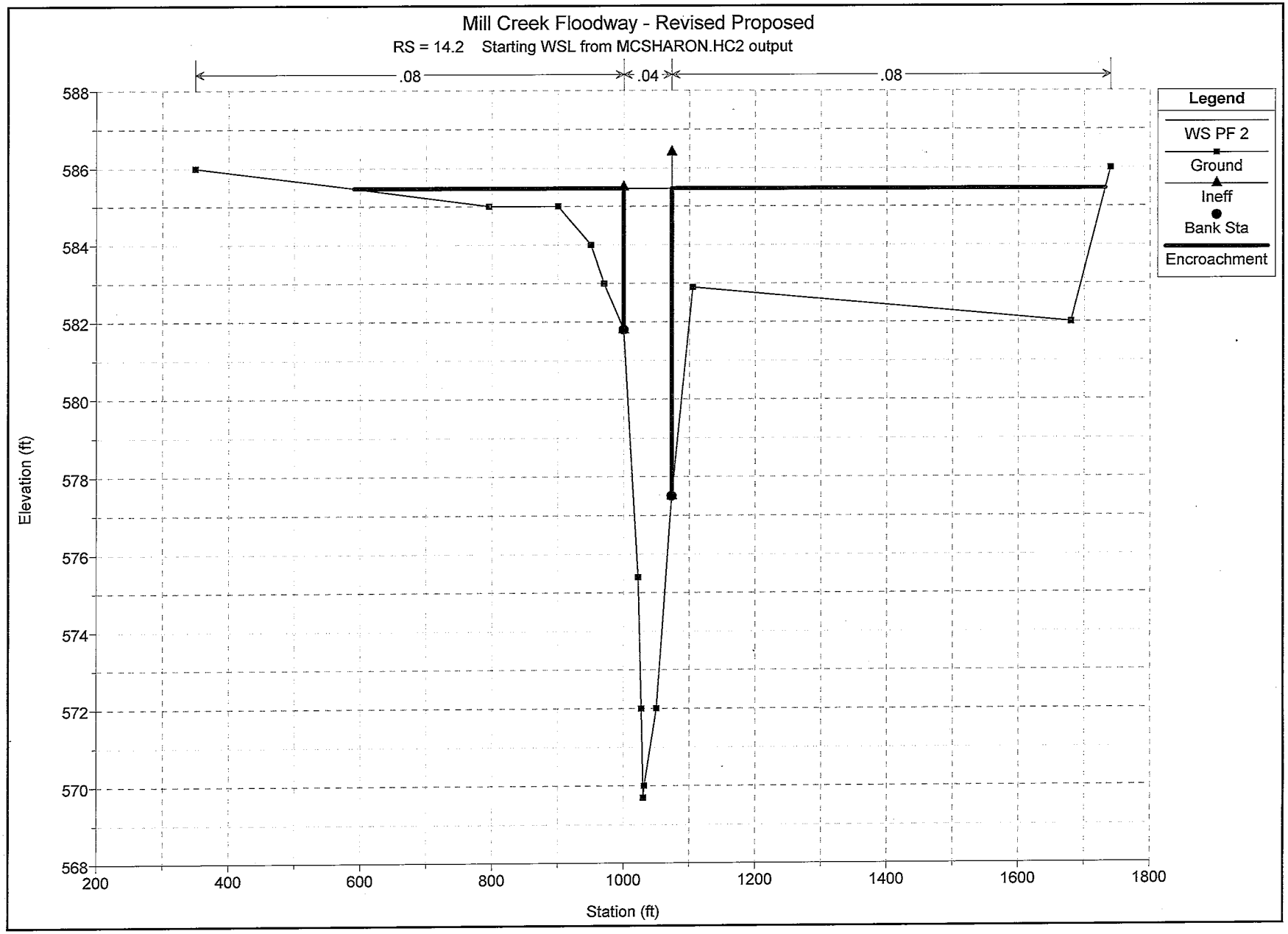

Mill Creek Floodway - Revised Existing
RS = 17.2 Section taken off Windisch Road bridge plan 3/84
.1
.12
.055
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
Station (ft)

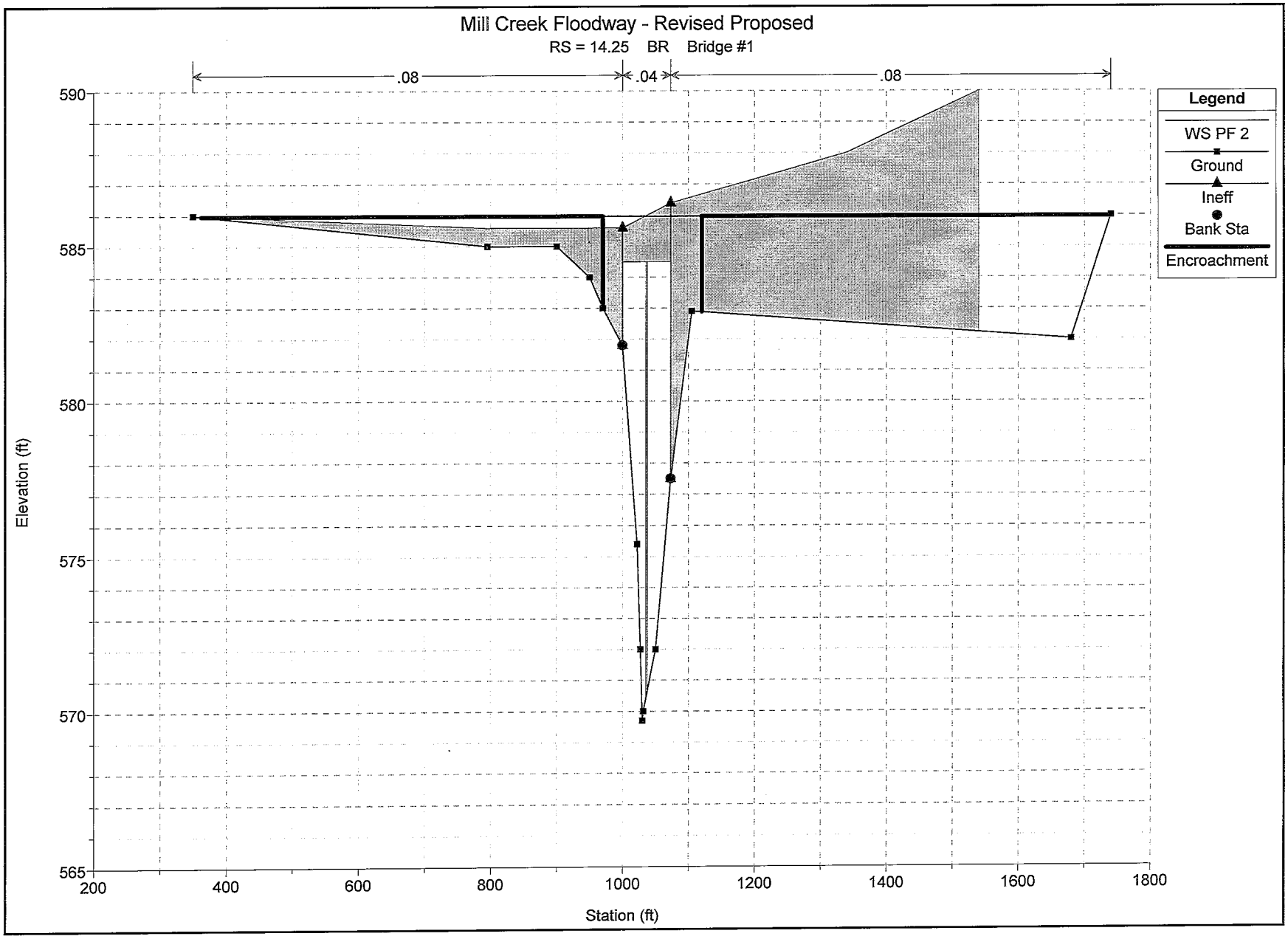

Mill Creek Floodway - Revised Existing
RS = 17.25 BR Bridge #2
.1
.12
0
5
5
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
595
590
585
580
575
570
Elevation (ft)
0
500
1000
1500
2000
2500
3000
Station (ft)

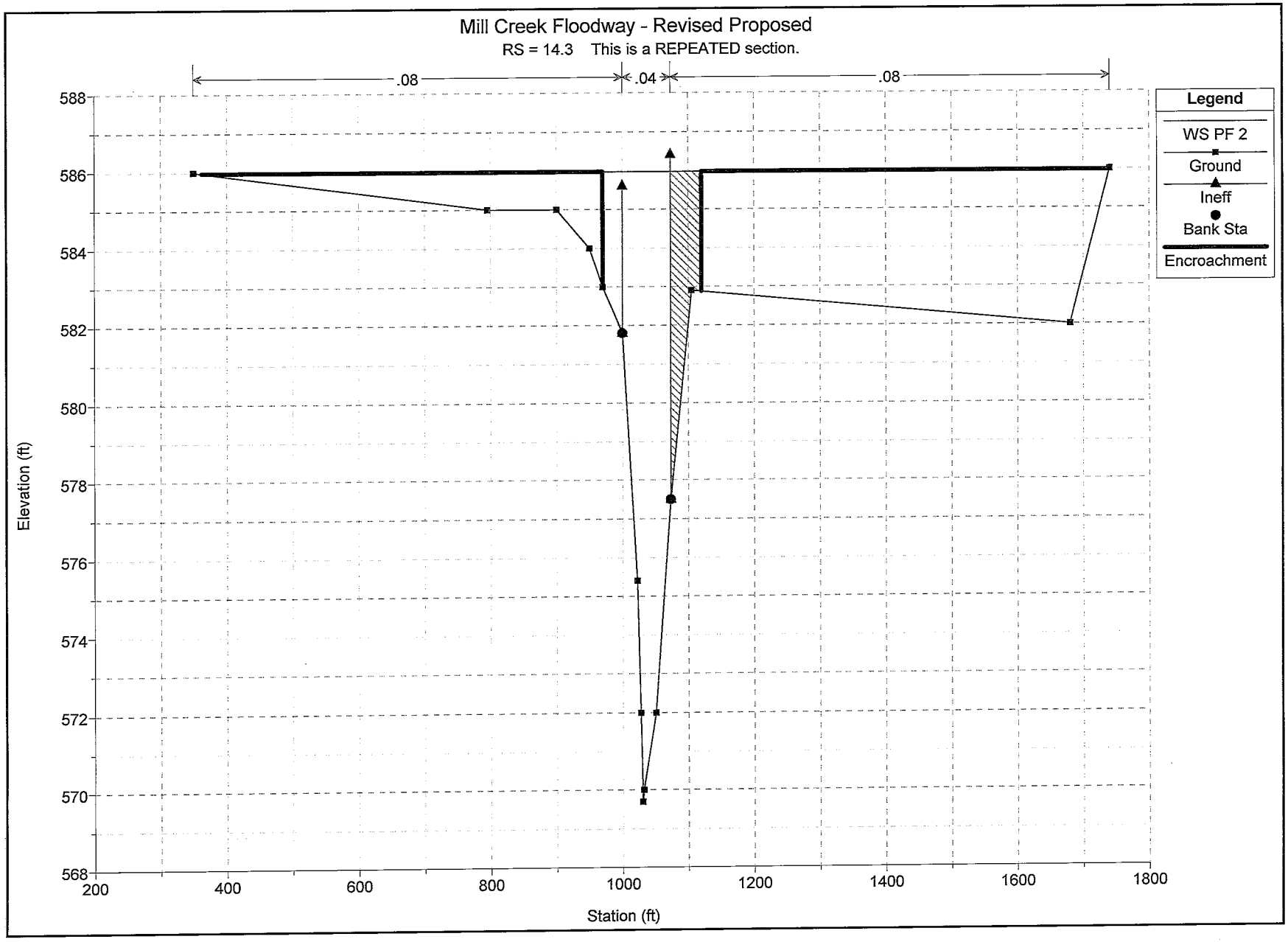

Mill Creek Floodway - Revised Existing
RS = 17.25 BR Bridge #2
.1
.12
0
5
5
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
595
590
585
580
575
570
Elevation (ft)
0
500
1000
1500
2000
2500
3000
Station (ft)

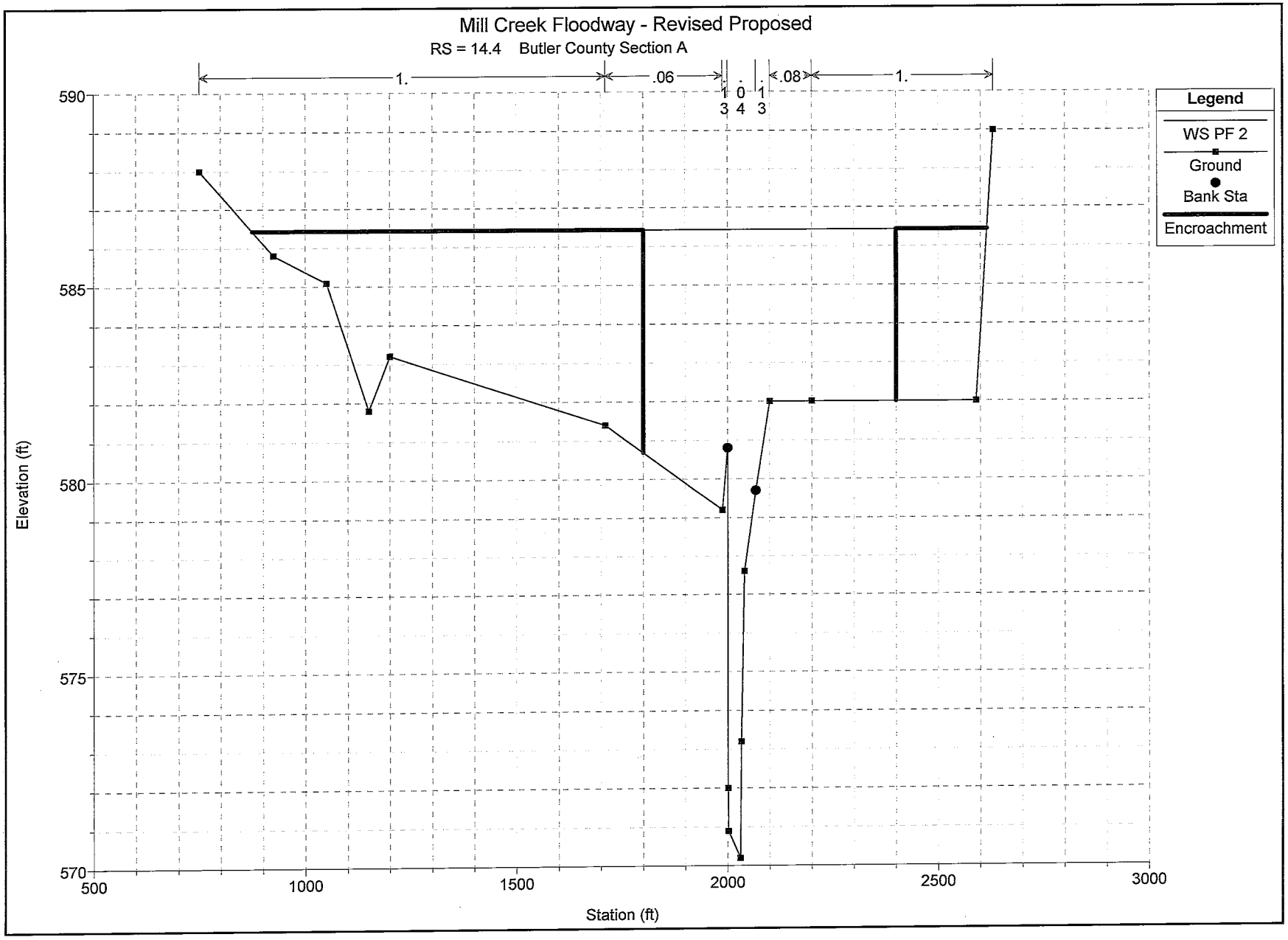

Mill Creek Floodway - Revised Existing
RS = 17.3
.1
.12
0
5
5
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
595
590
585
580
575
570
Elevation (ft)
0
500
1000
1500
2000
2500
3000
Station (ft)

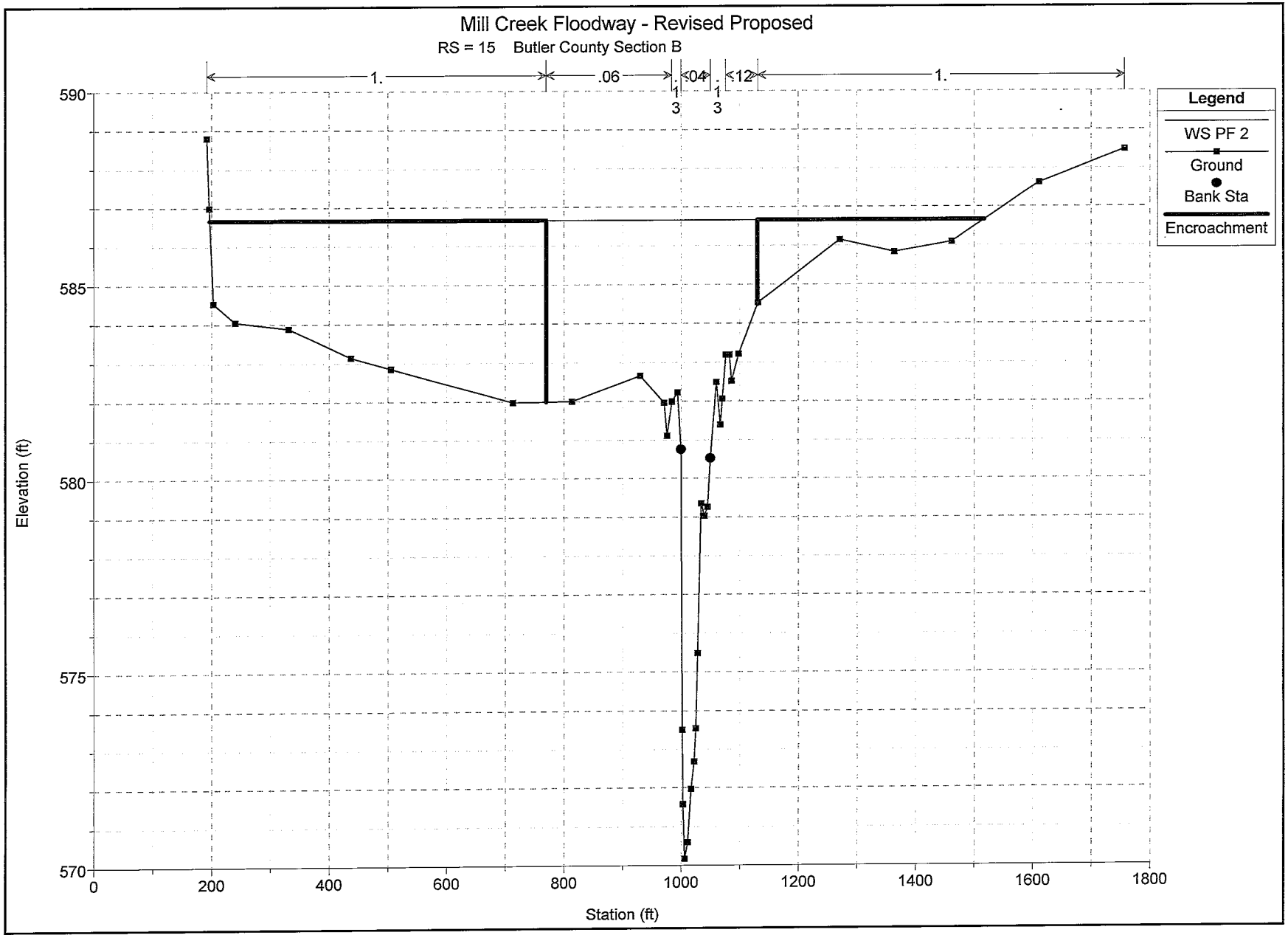

Mill Creek Floodway - Revised Existing
RS = 17.4 left bank elevation was changed from 588 to 583
1.
.06
.01
.03
.04
Legend
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

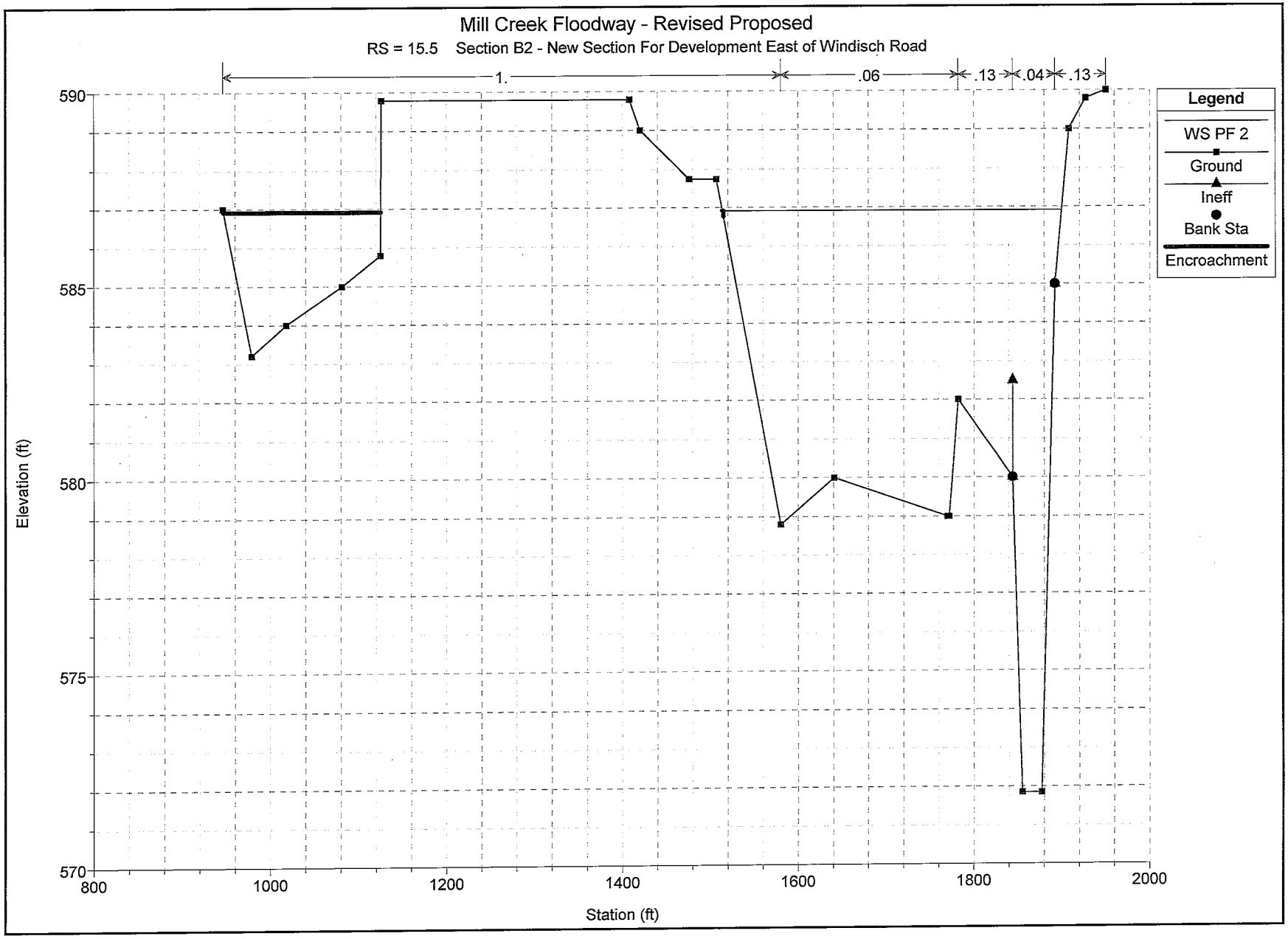

Mill Creek Floodway - Revised Proposed
RS = 14.2 Starting WSL from MCSHARON.HC2 output
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
588
586
584
582
580
578
576
574
572
570
568
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

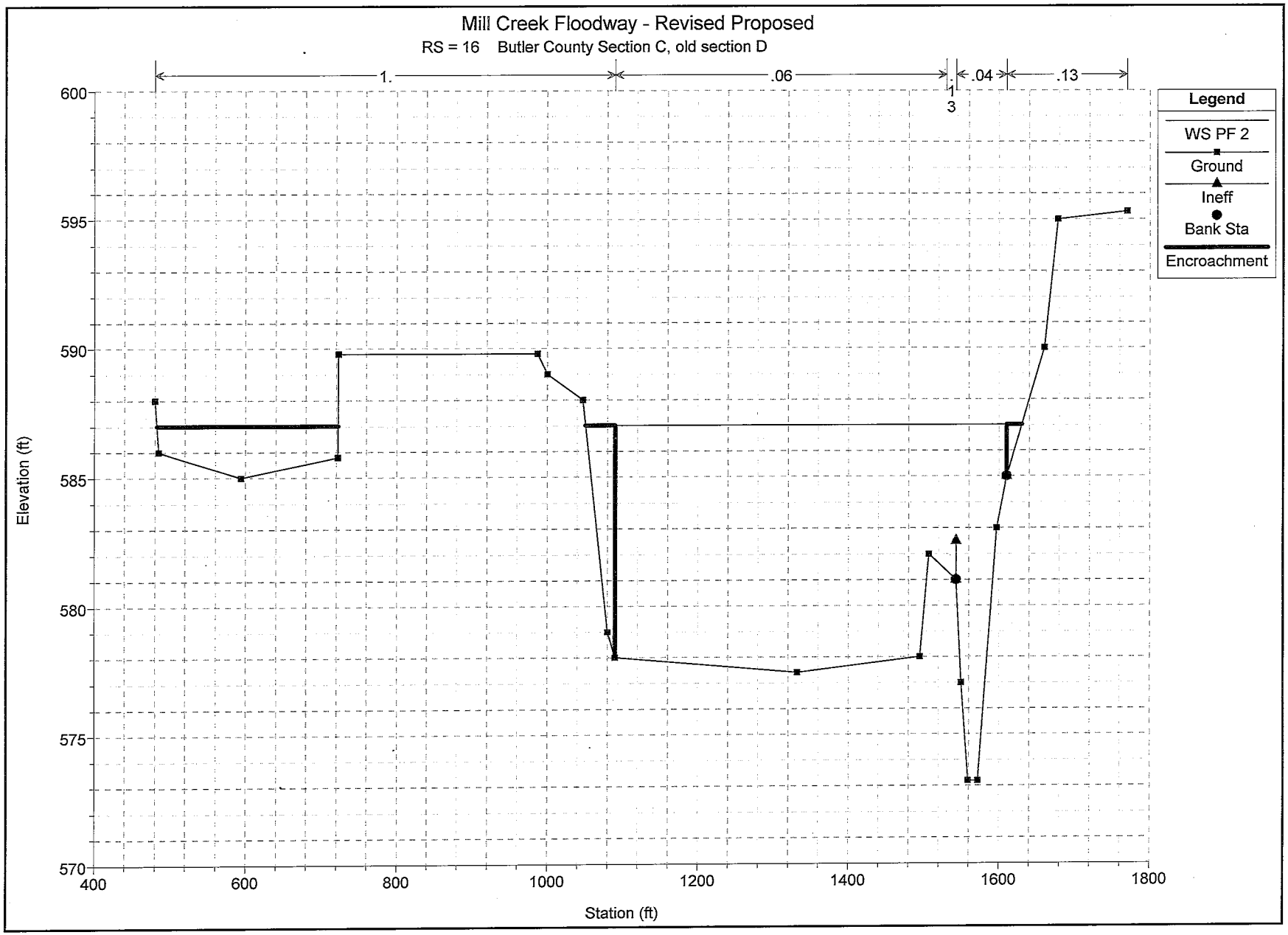

Mill Creek Floodway - Revised Proposed
RS = 14.25 BR Bridge #1
.08
.04
.08
590
585
580
575
570
565
Elevation (ft)
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment

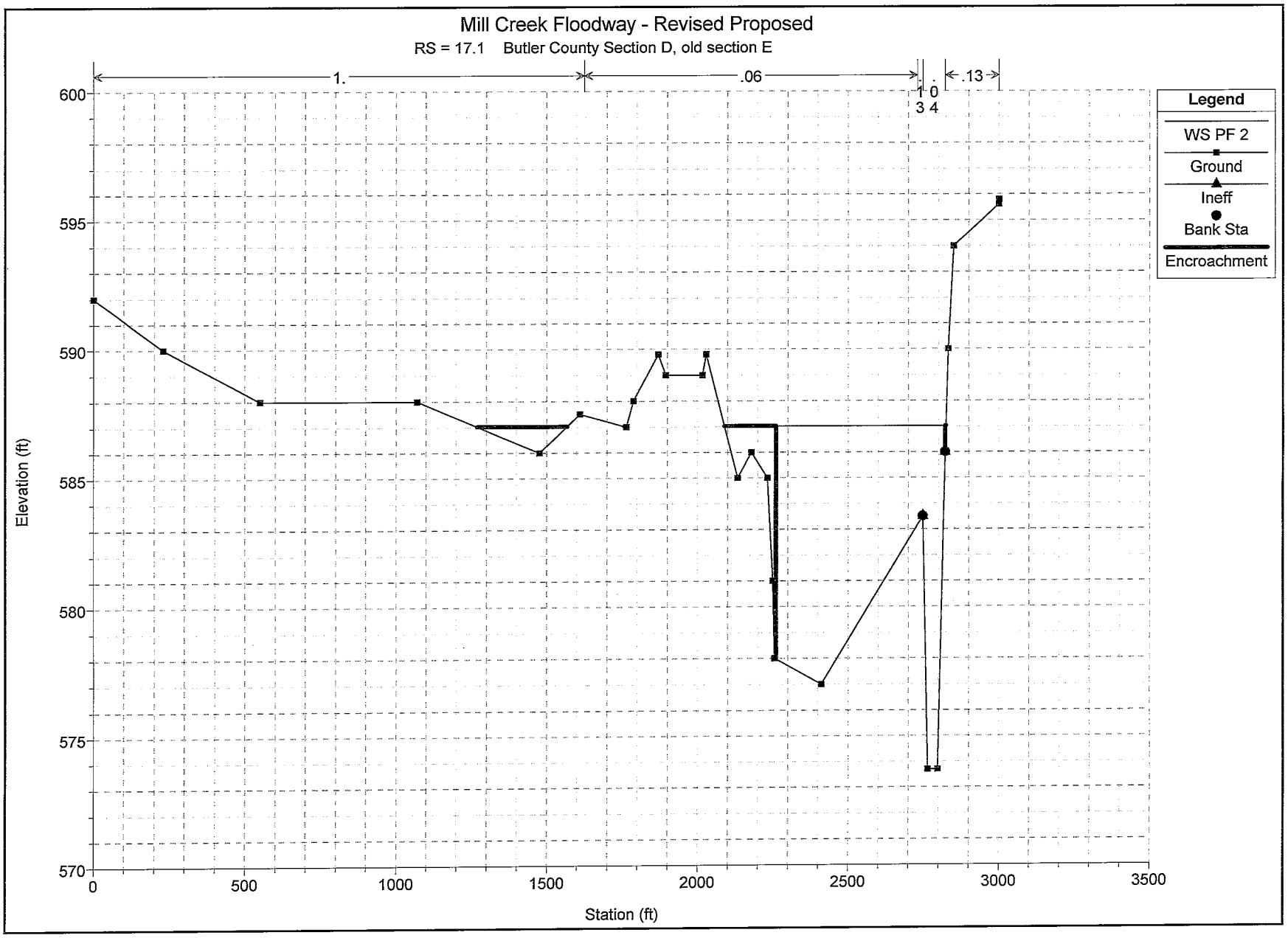

Mill Creek Floodway - Revised Proposed
RS = 14.3 This is a REPEATED section.
.08
.04
.08
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
588
586
584
582
580
578
576
574
572
570
568
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

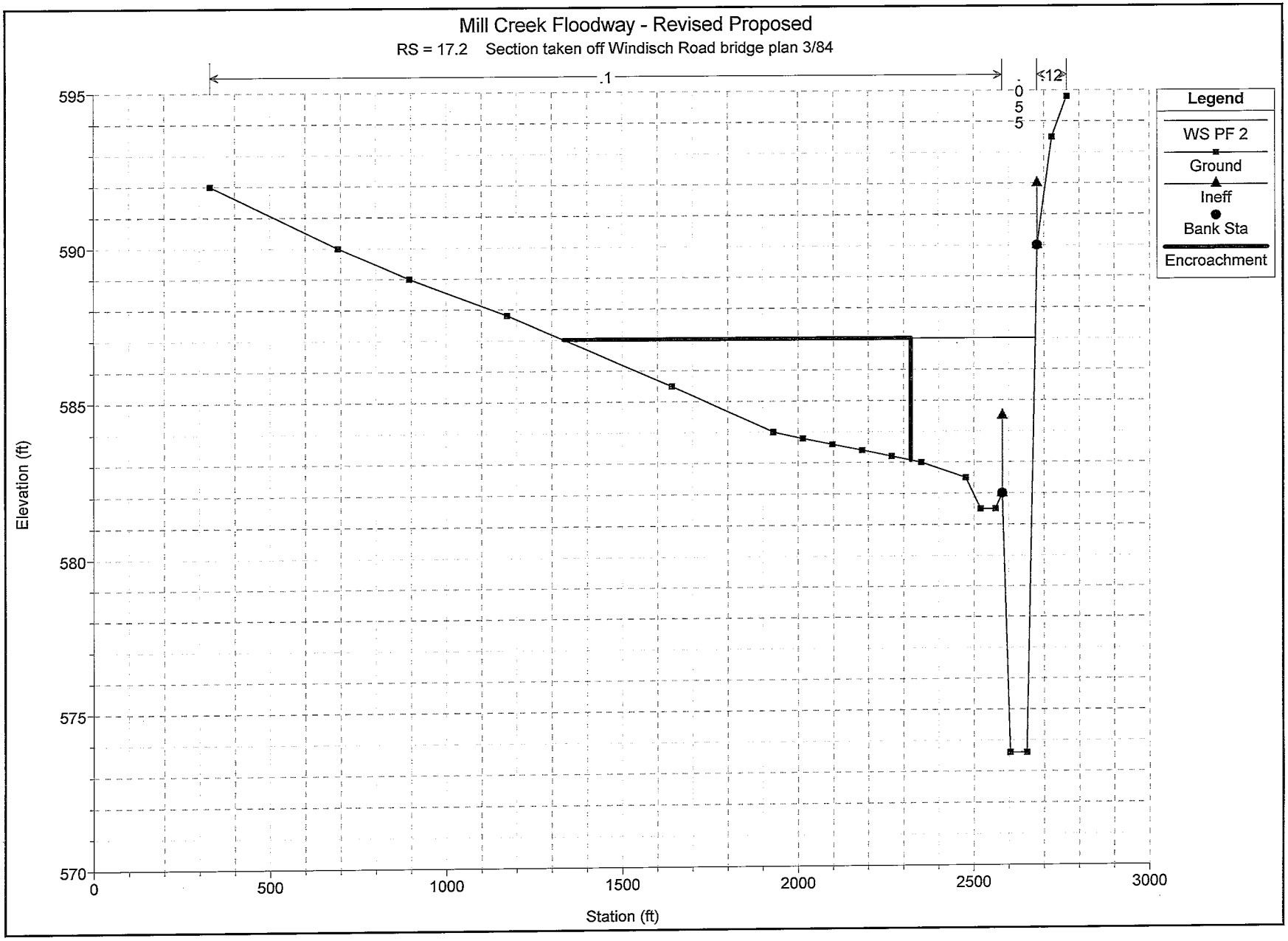

Mill Creek Floodway - Revised Proposed
RS = 14.4 Butler County Section A
1.
.06
.08
1.
.1 .0 .1
3 4 3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
590
585
580
575
570
Elevation (ft)
500
1000
1500
2000
2500
3000
Station (ft)

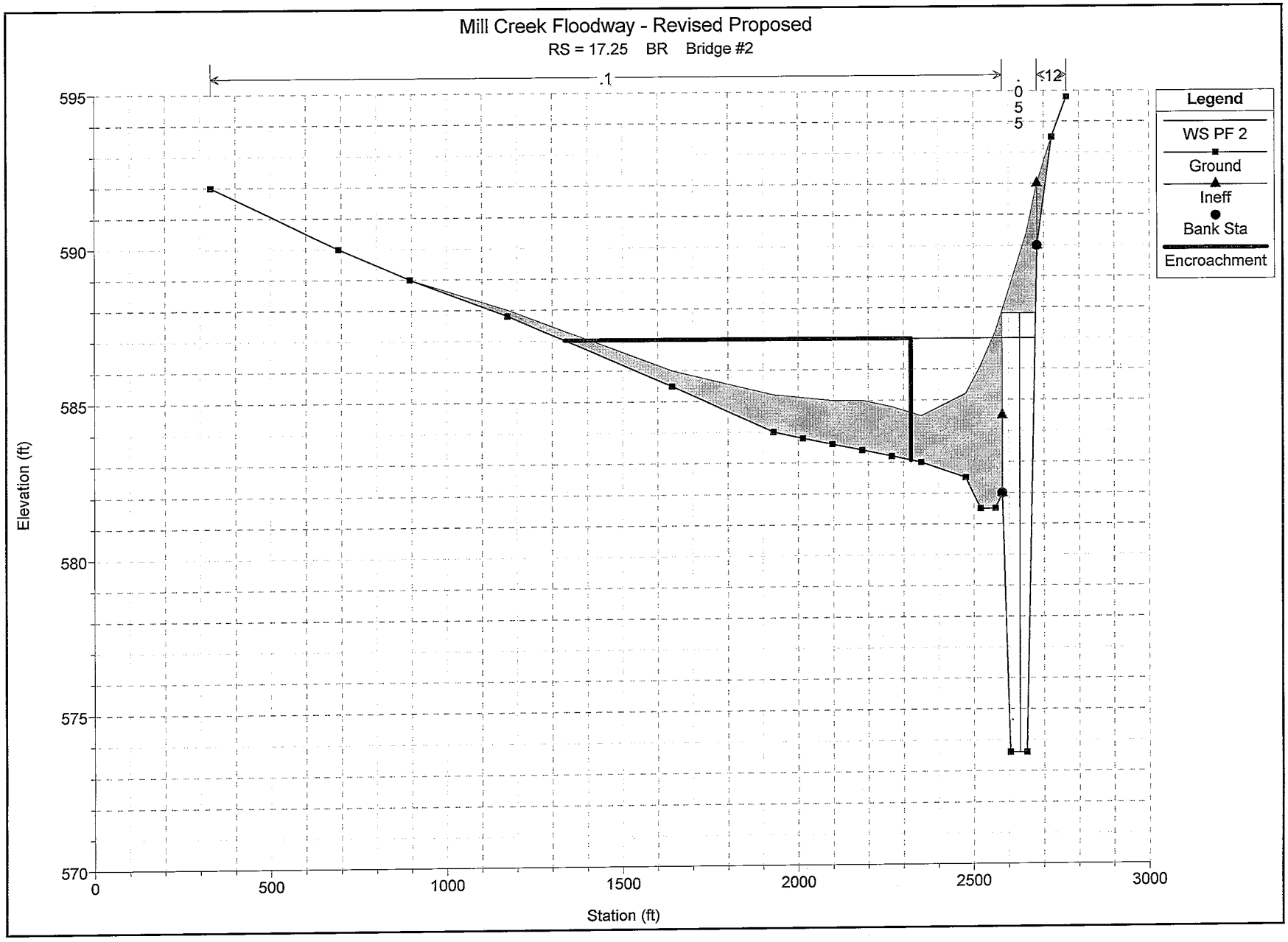

Mill Creek Floodway - Revised Proposed
RS = 15 Butler County Section B
1.
.06
.04
.12
1.
1
3
1
3
Legend
WS PF 2
Ground
Bank Sta
Encroachment
590
585
580
575
570
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

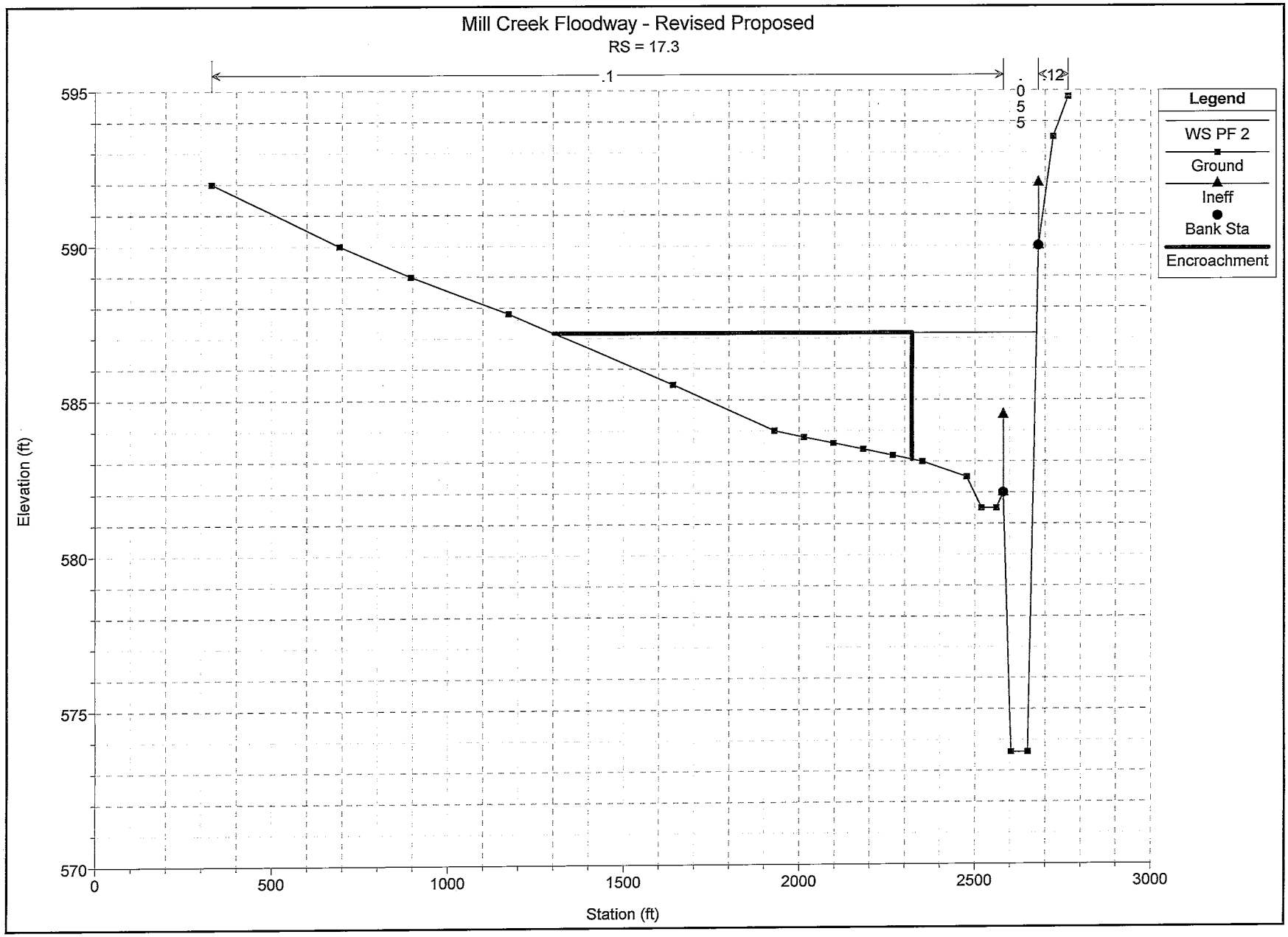

Mill Creek Floodway - Revised Proposed
RS = 15.5 Section B2 - New Section For Development East of Windisch Road
1.
.06
.13
.04
.13
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
590
585
580
575
570
800
1000
1200
1400
1600
1800
2000
Station (ft)

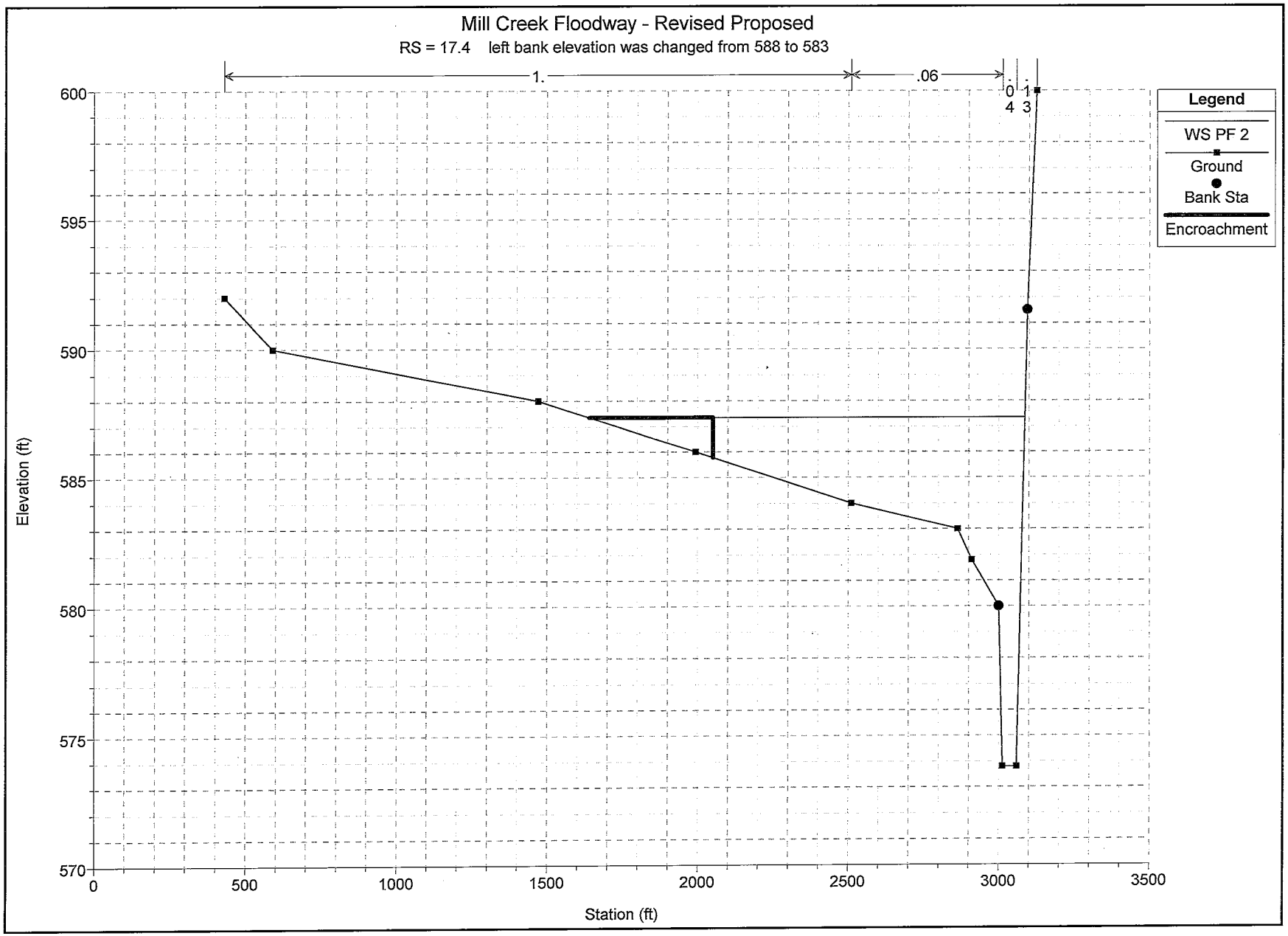

Mill Creek Floodway - Revised Proposed
RS = 16 Butler County Section C, old section D
1.
.06
.04
.13
1
3
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
400
600
800
1000
1200
1400
1600
1800
Station (ft)


Mill Creek Floodway - Revised Proposed
RS = 17.1 Butler County Section D, old section E
1.
.06
.13
.1
0
3 4
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Station (ft)


Mill Creek Floodway - Revised Proposed
RS = 17.2 Section taken off Windisch Road bridge plan 3/84
.1
.055
.12
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
Station (ft)


Mill Creek Floodway - Revised Proposed
RS = 17.25 BR Bridge #2
.1
.12
.055
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
595
590
585
580
575
570
Elevation (ft)
0
500
1000
1500
2000
2500
3000
Station (ft)


Mill Creek Floodway - Revised Proposed
RS = 17.3
.1
.12
.055
Legend
WS PF 2
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
Station (ft)


Mill Creek Floodway - Revised Proposed
RS = 17.4 left bank elevation was changed from 588 to 583
1.
.06
.01
.043
Legend
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

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07M022-000 CUT-FILL ANALYSIS

EAST BASIN EARTHWORK

Total Proposed Excavation = 78,390 C.Y. (48.59 Ac-ft)

Topsoil (12") = 30,605 C.Y. (18.97 Ac-ft)

Clay = 78,390 C.Y. – 30,605 C.Y. = 47,785 C.Y. (29.62 Ac-ft)

Flood Plain Volume Created = 78,390 C.Y.
- (30,605 C.Y. x 25%) (Respread Topsoil)
= 70,738 C.Y. (43.85 Ac-ft)

WRONG 47,785 C.Y.

Storage Needed for Buildings 1-5 = 64,533 C.Y. (40.00 Ac-ft)

Excess volume available for Proposed = 70,738 C.Y.
- 64,533 C.Y.
= 6,205 C.Y.

NO EXCESS VOLUME

EARTHWORK QUANTITES

Excavation (C.Y.)	71,298 C.Y.
Embankment (C.Y.)	71,711 C.Y.

FLOOD PLAIN ANALYSIS

ON-SITE

Flood Plain Fill = 71,711 C.Y. (Total Fill in Flood Plain)
- 16,285 C.Y. (Fill above Flood Plain Elevation, 588.40)
= 55,426 C.Y. ✓

NOT IN FLOODPLAIN !!! COMP

Flood Plain Storage Required = 55,426 C.Y. (Flood Plain Fill)
+ 10,648 C.Y. (Detention Volume)
+ 3,346 C.Y. (Water Quality Volume)
= **69,420 C.Y.**

Compensation Volume Provided = 71,298 C.Y. (Cut in Flood Plain)
+ 6,205 C.Y. (Excess Volume from East Basin-Above)
= ~~77,503 C.Y.~~

NO EXCESS

71,298 CY - 69,420 CY = 1,878 CY EXCESS

700 Nilles Road, Fairfield, OH 45014
14 East Eighth Street, Covington, KY 41011
6900 Tylersville Road, Mason, OH 45040
777 Eads Pkwy., Suite C, Lawrenceburg, IN 47025

Prismoidal Volume Results

==========

Original Surface Model: (01c020)ORIGINAL
Final Surface Model: Grading 10-22-07
Cut Compaction Factor: 0.00
Fill Compaction Factor: 0.00

Raw Cut Volume: 71298.02 cu yd
Compacted Cut Volume: 0.00 cu yd
Total Cut Volume: 71298.02 cu yd

Raw Fill Volume: 71710.84 cu yd
Compacted Fill Volume: 0.00 cu yd
Total Fill Volume: 71710.84 cu yd

Prismoidal Volume Results

==========

Original Surface Model: Constant Elevation: 588.40
Final Surface Model: Grading 10-22-07
Cut Compaction Factor: 0.00
Fill Compaction Factor: 0.00

Raw Cut Volume: 163175.59 cu yd
Compacted Cut Volume: 0.00 cu yd
Total Cut Volume: 163175.59 cu yd

Raw Fill Volume: 16285.84 cu yd
Compacted Fill Volume: 0.00 cu yd
Total Fill Volume: 16285.84 cu yd

Water Quality Volume & Elev. 06M079-000

$WQ_v = C \times P \times A/12$

WALTER WINDISCH PROPERTY
↳ DOES IT GET THERE?

$A = 41.1\ Ac\ (Onsite) + 14.2\ Ac\ (off\ site) = 55.3$ 'MOUND BETWEEN THE TWO PROPERTIES

$P = 0.95$

$C = 0.8$ (Industrial & Commercial)

$WQ_v = 2.765\ Ac\text{-}ft.$

$0.95\,WQ_v = 2.074\ Ac\text{-}ft$ $(90343\ ft^3)$

$\therefore Q = \frac{90343\ ft^3}{24hr} = 1.05\ cfs$

Normal Pool = 576.94
Water Quality Achieved = 577.78 $\Rightarrow h = 0.84\ ft.$

~~Orifice Size~~

$Q = C_d A \sqrt{2gh}$

$Q = 1.05\ cfs$
$C_d = 0.61$
$g = 32.2\ ft/sec^2$
$h = Avg\ h = 0.84/2 = 0.42\ ft$
$A = 0.331$
$\Rightarrow 7.79" = D$

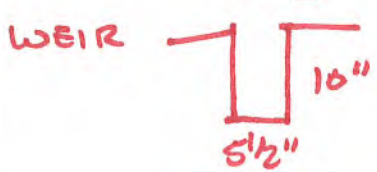
~~7 1/2" Orifice~~

Weir

$Q = CLH^{3/2}$

$Q = 1.05\ cfs$
$C = 3$
$H = 0.42\ ft$ USE 0.84'
$L = 1.29 \Rightarrow 1'\ 1/4"$ ✓

L = 0.4546'
USE 0.45 OR 5 1/2"



DATE 4-17-98
BY DMS
CK'D.

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CIVIL ENGINEERS • SURVEYORS • PLANNERS

PROJECT
PAGE NUMBER 1 of 3

SUBJECT Union Commerce Park – Regional Detention

Criteria – Detain the difference between the 10yr pre developed and 50 yr post developed.

IS THIS A REAL FACTOR

OFFSITE DUE TO BERMS ON NORTH SIDE OF BLDG'S? NB.

Area = 14.2 acres Slope = $\frac{596-589}{1700}$ = 0.0041 ≈ 0.4%

Soil Types

FcA	10%	"A"
RvB2	30%	"B"
Sh	60%	"C"

Average C = 77 (see pg A)

Time of Concentration = 1.4 hrs. (See pg B)

Q_{10} = 11 cfs Q_{50} = 17 cfs.

Union Commerce Park

Area = 41.1 acres Slope = $\frac{590-582}{2400}$ = 0.0033 = 0.33%

Present Conditions

average C = 70 (see pg E)

Soil Type Sh - 80% Ec - 20% ⇒ Type "C"

Time of Concentration = 1.58 hrs. (see pg F)

Q_{10} = 23 cfs.

Future Conditions

average C = 91 (See pg H)

Time of Concentration = 0.44 hrs (See pg I)

Q_{10} = 120 cfs Q_{50} = 159 cfs.

DATE 4-17-98
BY DMS
CK'D.

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PROJECT Union Commerce Park

SUBJECT

Allowable Discharge = Q_{10} (site) + Q_{10} (offsite)

Q_A = 23 cfs + 11 cfs

Q_A = 34 cfs.

Peak Inflow = Q_{50}(site) + Q_{50}(offsite)

Q_p = 159 cfs + 17 cfs

Q_p = 176 cfs.

Required Volume for the entire site = 6.6 Ac-ft (see pg L)

Volume Provided = 6.89 Ac Ft @ elev = 581.36 ft. (see pg M)

Outlet Pipe

CULVERTS

DIAMETER (IN)	? 30
LENGTH (FT)	? 162
FRICTION COEFF (FT^1/6)	? .018
ENT+EXIT COEFF	? 1
INLET CONTROL COEFF	? .58
INV ELEV OUT (FT)	? 576.05
INV ELEV IN (FT)	? 577 576.94
TAILWATER ELEV (FT)	? 576.05
ELEV INCREMENT (FT)	? .5

ROUTE WQ WEIR AND CULVERT TOGETHER

DETAIL OUTET STRUCTURE

RESULTS

HEADWATER (FT)		FLOWRATE (CFS)
579.50	OC	19.53
580.00	OC	24.13
580.50	OC	27.98
581.00	OC	31.36
581.36 ← 581.50	OC	34.42 — 34.00
582.00	OC	37.22
582.50	OC	39.83
583.00	OC	42.27
583.50	OC	44.58
584.00	OC	46.78
584.50	OC	48.88
585.00	OC	50.89
585.50	OC	52.83
586.00	OC	54.69
586.50	OC	56.50
587.00	OC	58.25

DATE 4-17-98
BY DMS
CK'D.

BAYER & BECKER ENGINEERS
CIVIL ENGINEERS • SURVEYORS • PLANNERS

PROJECT Union Commerce Park
PAGE NUMBER 3 of 3

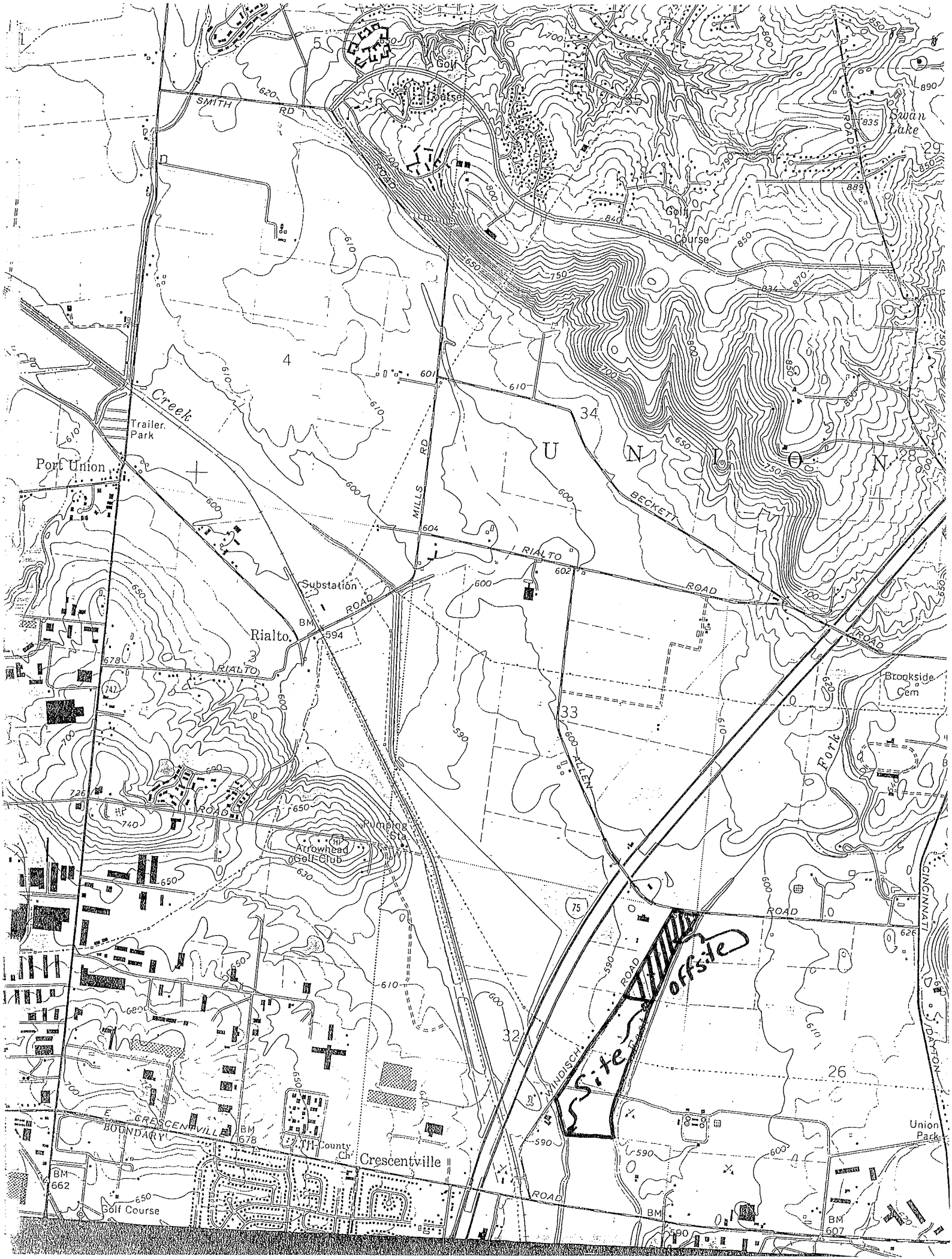
SUBJECT

Spillway Calculations.

$Q = 3.33 L H^{3/2}$ $L = 65$ $H = 1.2$

$Q = 3.33(65)(1.2)^{1.5}$

$Q = 284.5$ cfs ✓ FROM WHERE? ELEVATION? ...


Golf
Course
SMITH RD
Swan Lake
Golf Course
Trailer Park
Port Union
Creek
MILLS RD
BECKETT ROAD
RIALTO ROAD
Substation
Rialto
BM 594
Brookside Cem
Fork
ALLEN ROAD
Pumping Sta
Arrowhead Golf Club
CINCINNATI DAYTON ROAD
Site offsite
WINDISCH ROAD
E CRESCENTVILLE BOUNDARY
TH County Ch
Crescentville
Golf Course
BM 662
BM 678
BM 607
Union Pack
U N I O N
4
5
32
33
34
26
28
29

TR-55 CURVE NUMBER COMPUTATION VERSION 1.11

Project : Windisch Rd Offsite
County :
Subtitle: 10 year
Subarea : off

State:

User:
Checked: _____

Date: 03-31-97
Date: _____

COVER DESCRIPTION		Hydrologic Soil Group A	B	C	D
		Acres (CN)			
OTHER AGRICULTURAL LANDS	----	1.42(59)	4.26(74)	8.52(82)	-
Farmsteads					
Total Area (by Hydrologic Soil Group)		1.42	4.26	8.52	
		====	====	====	

SUBAREA: off TOTAL DRAINAGE AREA: 14.2 Acres WEIGHTED CURVE NUMBER:77

A

TR-55 Tc and Tt THRU SUBAREA COMPUTATION VERSION 1.11

Project : Windisch Rd Offsite State: User: Date: 03-31-97
County : Checked: _____ Date: _____
Subtitle: 10 year

Subarea #1 - off

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.2	300	.004	f					1.090
Shallow Concent'd		1000	0.004	u					0.272
Open Channel		400						2.5	0.044
								Time of Concentration =	1.41*
									=====

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense

--- Shallow Concentrated --- Surface Codes ---

P Paved
U Unpaved

- Generated for use by TABULAR method

B

TR-55 TABULAR DISCHARGE METHOD VERSION 1.11

Project : Windisch Rd Offsite User: Date: 03-31-97
County : State: Checked: _____ Date: _____
Subtitle: 10 year

Total watershed area: 0.022 sq mi Rainfall type: II Frequency: 10 years

	Subareas
	off
Area(sq mi)	0.02*
Rainfall(in)	4.2
Curve number	77*
Runoff(in)	1.93
Tc (hrs)	1.41*
(Used)	1.50
TimeToOutlet	0.00
Ia/P	0.14

Time (hr)	Total Flow	Subarea Contribution to Total Flow (cfs) off
11.0	0	0
11.3	0	0
11.6	1	1
11.9	1	1
12.0	1	1
12.1	1	1
12.2	1	1
12.3	2	2
12.4	3	3
12.5	4	4
12.6	6	6
12.7	7	7
12.8	9	9
13.0	10	10
13.2	11P	11P
13.4	10	10
13.6	8	8
13.8	7	7
14.0	6	6
14.3	4	4
14.6	3	3
15.0	3	3
15.5	2	2
16.0	2	2
16.5	1	1
17.0	1	1
17.5	1	1
18.0	1	1
19.0	1	1
20.0	1	1
22.0	1	1
26.0	0	0

P - Peak Flow * - value(s) provided from TR-55 system routines

TR-55 TABULAR DISCHARGE METHOD VERSION 1.11

Project : Windisch Rd Offsite User: Date: 03-31-97
County : State: Checked: _____ Date: _____
Subtitle: 50 year

Total watershed area: 0.022 sq mi Rainfall type: II Frequency: 50 years

---------- Subareas ----------

	off
Area(sq mi)	0.02*
Rainfall(in)	5.2
Curve number	77*
Runoff(in)	2.79
Tc (hrs)	1.41*
(Used)	1.50
TimeToOutlet	0.00
Ia/P	0.11

Time (hr)	Total Flow	Subarea Contribution to Total Flow (cfs) off
11.0	0	0
11.3	1	1
11.6	1	1
11.9	1	1
12.0	1	1
12.1	2	2
12.2	2	2
12.3	3	3
12.4	5	5
12.5	7	7
12.6	9	9
12.7	11	11
12.8	13	13
13.0	15	15
13.2	17P	17P
13.4	14	14
13.6	12	12
13.8	10	10
14.0	8	8
14.3	6	6
14.6	5	5
15.0	4	4
15.5	3	3
16.0	2	2
16.5	2	2
17.0	2	2
17.5	1	1
18.0	1	1
19.0	1	1
20.0	1	1
21.0	1	1
24.0	0	0

P - Peak Flow * - value(s) provided from TR-55 system routines

D

TR-55 CURVE NUMBER COMPUTATION VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: pre 10
Subarea : site

State:

User:
Checked: ____

Date: 03-31-97
Date: _____

COVER DESCRIPTION		Hydrologic Soil Group A	B	C	D
		Acres (CN)			
OTHER AGRICULTURAL LANDS					
Brush - brush, weed, grass mix	fair	-	-	41.1(70)	-
Total Area (by Hydrologic Soil Group)				41.1	

SUBAREA: site TOTAL DRAINAGE AREA: 41.1 Acres WEIGHTED CURVE NUMBER:70

E

TR-55 Tc and Tt THRU SUBAREA COMPUTATION VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: pre 10
State:
User:
Checked: ____
Date: 03-31-97
Date: _____

Subarea #1 - site

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.2	300	.0033	f					1.178
Shallow Concent'd		1000	.0033	u					0.300
Open Channel		1100						3.0	0.102
								Time of Concentration =	1.58*
									=====

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense

--- Shallow Concentrated --- Surface Codes ---

P Paved
U Unpaved

- Generated for use by TABULAR method

F

TR-55 TABULAR DISCHARGE METHOD VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: pre 10

State:

User:
Checked: ____

Date: 03-31-97
Date: _____

Total watershed area: 0.064 sq mi Rainfall type: II Frequency: 10 years

---------- Subareas ----------

	site
Area(sq mi)	0.06*
Rainfall(in)	4.2
urve number	70*
unoff(in)	1.43
Tc (hrs)	1.58*
(Used)	1.50
imeToOutlet	0.00
Ia/P	0.21

ime (hr)	Total Flow	Subarea Contribution to Total Flow (cfs) site
1.0	0	0
1.3	0	0
11.6	1	1
1.9	1	1
2.0	1	1
12.1	1	1
2.2	2	2
2.3	3	3
12.4	5	5
2.5	7	7
2.6	10	10
12.7	13	13
2.8	16	16
3.0	20	20
13.2	23P	23P
13.4	20	20
13.6	18	18
13.8	15	15
1 .0	12	12
1 .3	9	9
14.6	8	8
1 .0	6	6
1 .5	5	5
16.0	4	4
1 .5	3	3
1 .0	3	3
17.5	3	3
1 .0	2	2
1 .0	2	2
20.0	2	2
2 .0	1	1
2 .0	0	0

P - Peak Flow * - value(s) provided from TR-55 system routines

TR-55 CURVE NUMBER COMPUTATION VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: post10
Subarea : site

State:

User:
Checked: ____

Date: 03-31-97
Date: _____

COVER DESCRIPTION	Hydrologic Soil Group A	B	C	D
	Acres (CN)			
FULLY DEVELOPED URBAN AREAS (Veg Estab.)				
Urban Districts Avg % imperv				
Industrial 72	-	-	41.1(91)	-
Total Area (by Hydrologic Soil Group)			41.1	
			====	

SUBAREA: site TOTAL DRAINAGE AREA: 41.1 Acres WEIGHTED CURVE NUMBER:91

H

TR-55 Tc and Tt THRU SUBAREA COMPUTATION VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: post10 State: User: Date: 03-31-97
Checked: ____ Date: _____

Subarea #1 - site

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.2	300	.0033	a					0.100
Shallow Concent'd		1000	.0033	p					0.238
Open Channel		1100						3.0	0.102

Time of Concentration = 0.44*
=====

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense

--- Shallow Concentrated --- --- Surface Codes ---

P Paved
U Unpaved

- Generated for use by TABULAR method

TR-55 TABULAR DISCHARGE METHOD VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: post10

State:

User:
Checked: ____

Date: 03-31-97
Date: _____

Total watershed area: 0.064 sq mi Rainfall type: II Frequency: 10 years

---------- Subareas ----------

	site
Area(sq mi)	0.06*
Rainfall(in)	4.2
Curve number	91*
Runoff(in)	3.16
Tc (hrs)	0.44*
(Used)	0.40
TimeToOutlet	0.00
Ia/P	0.05
(Used)	0.10

Time (hr)	Total Flow	Subarea Contribution to Total Flow (cfs) site
11.0	4	4
11.3	5	5
11.6	7	7
11.9	16	16
12.0	29	29
12.1	55	55
12.2	95	95
12.3	120P	120P
12.4	117	117
12.5	87	87
12.6	60	60
12.7	44	44
12.8	33	33
13.0	21	21
13.2	16	16
13.4	13	13
13.6	11	11
13.8	10	10
14.0	9	9
14.3	8	8
14.6	7	7
15.0	6	6
15.5	6	6
16.0	5	5
16.5	4	4
17.0	4	4
17.5	4	4
18.0	4	4
19.0	3	3
21.0	3	3
23.0	2	2
26.0	0	0

P - Peak Flow * - value(s) provided from TR-55 system routines

5

TR-55 TABULAR DISCHARGE METHOD VERSION 1.11

Project : Windisch Rd Site
County :
Subtitle: post50

State:

User:
Checked: ____

Date: 03-31-97
Date: ____

Total watershed area: 0.064 sq mi Rainfall type: II Frequency: 50 years

---------- Subareas ----------

	site
Area(sq mi)	0.06*
Rainfall(in)	5.2
Curve number	91*
Runoff(in)	4.18
Tc (hrs)	0.44*
(Used)	0.40
TimeToOutlet	0.00
Ia/P	0.04
(Used)	0.10

Time (hr)	Total Flow	Subarea Contribution to Total Flow (cfs) site
11.0	5	5
11.3	7	7
11.6	10	10
11.9	21	21
12.0	38	38
12.1	73	73
12.2	126	126
12.3	159P	159P
12.4	154	154
12.5	116	116
12.6	80	80
12.7	58	58
12.8	44	44
13.0	28	28
13.2	21	21
13.4	17	17
13.6	15	15
13.8	13	13
14.0	12	12
14.3	10	10
14.6	9	9
14.0	8	8
15.5	8	8
16.0	7	7
16.5	6	6
17.0	6	6
17.5	5	5
18.0	5	5
19.0	4	4
20.0	4	4
22.0	3	3
26.0	0	0

P - Peak Flow * - value(s) provided from TR-55 system routines

K

TR-55 STORAGE VOLUME FOR DETENTION BASINS VERSION 1.11

Project :
County :
Subtitle:

State:

User:
Checked: ____

Date: 04-17-98
Date: _____

Drainage Area: 41.1 Acres
Rainfall-Type: II
Runoff: 4.2 inches
Peak Inflow: 176 cfs
Peak Outflow: 34 cfs
Rainfall Frequency: 50 years
Detention Basin Storage Volume: 1.94 inches or 6.6 acre feet

POND-2 Version: 5.17
S/N:

Union Commerce Center
Union Township
Butler County, Ohio
4/17/98

CALCULATED 04-17-1998 11:42:10
DISK FILE: c:\pond2\NORTHPAR.VOL

Planimeter scale: 1 inch = 50 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
576.94					2.07 WQv
577.00 78	19.16	1.10	0.00	0.00	0.00 STM
578.00	21.76	1.25	3.52	1.17	1.17
580.00	30.62	1.76	4.49	2.99	4.17
581.36	*I*	2.26	6.01	2.72	6.89 DET VOL
582.00	43.80	2.51	6.37	4.25	8.41

I ---> Interpolated area from closest two planimeter readings.

* Incremental volume computed by the Conic Method for Reservoir Volumes.

STORMWATER DETENTION

CALCULATE STORAGE THIS WAY...

577.78 UP TO 6.6 AC·FT OF STORAGE @ ELEVXXX.XX'

576.94 TO 577.78 WQv NOT TO BE INCLUDED IN DETENTION STORAGE VOLUME

M

Sh - C
Ee - C

— offsite
— Property