Transect Number: CM-54

Elevation profile
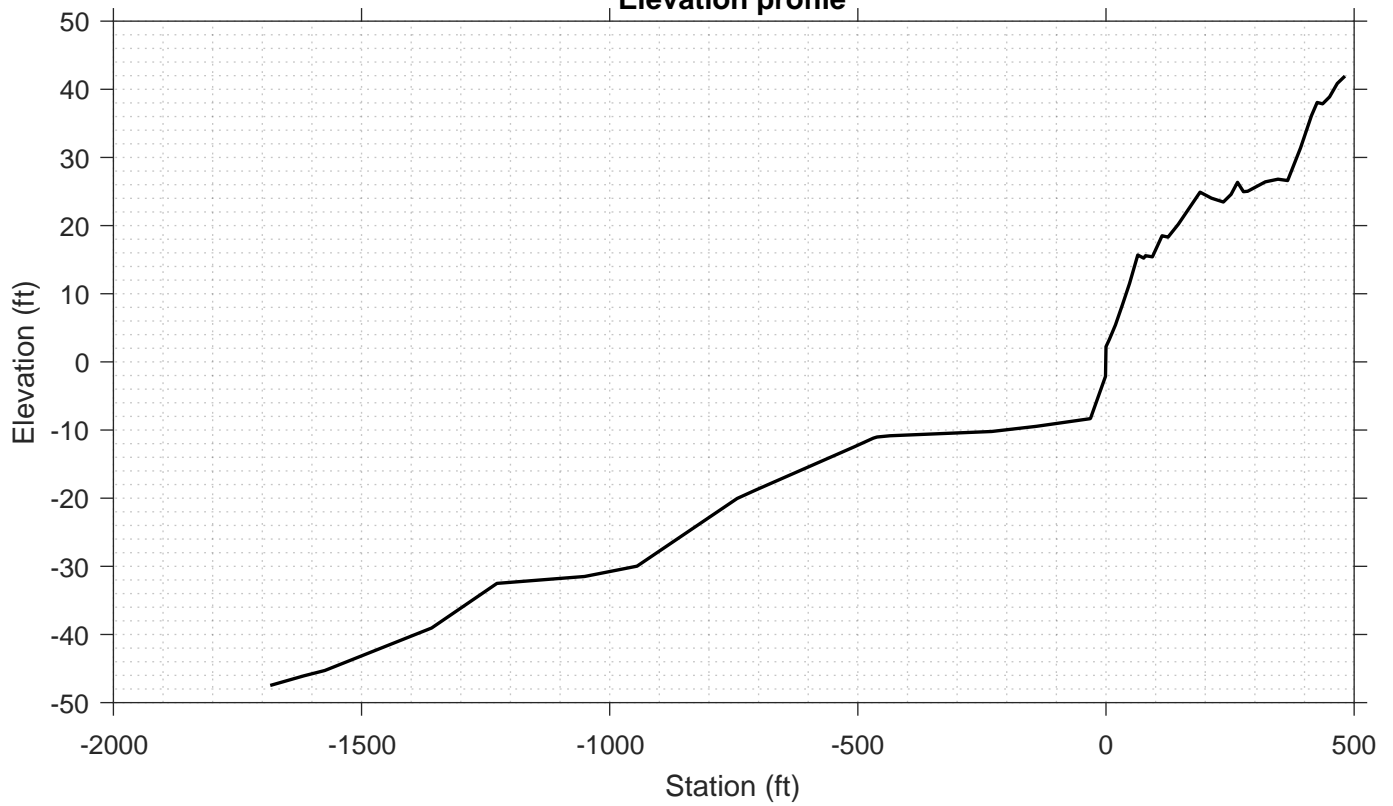
```
_____
DATA LOG FOR TRANSECT ID: CM-54
_____


_____
PART 1: USER INPUT


SWAN 1-D / WHAFIS input
_____
station:      -451 ft
LON:          -70.1902 deg E
LAT:          43.6512 deg N
Bottom ELEV:        -10.9509 ft-NAVD88
TWL:          8.9874 ft-NAVD88
HS:           11.6676 ft
TP:           14.124 sec
Wave Direction bin: 90 deg CCW from East (90 deg sector)
Transect Direction:   111.1043 deg CCW from East


TAW/RUNUP input
_____
toe sta:      -35 ft
toe elev:     -8.366 ft-NAVD88
top sta:      113 ft
top elev:     18.5072 ft-NAVD88
*Wave and water level conditions at toe to be calculated in SWAN 1-D*

PART 1 COMPLETE_____
```

transectCM-54: User-Selected inputs
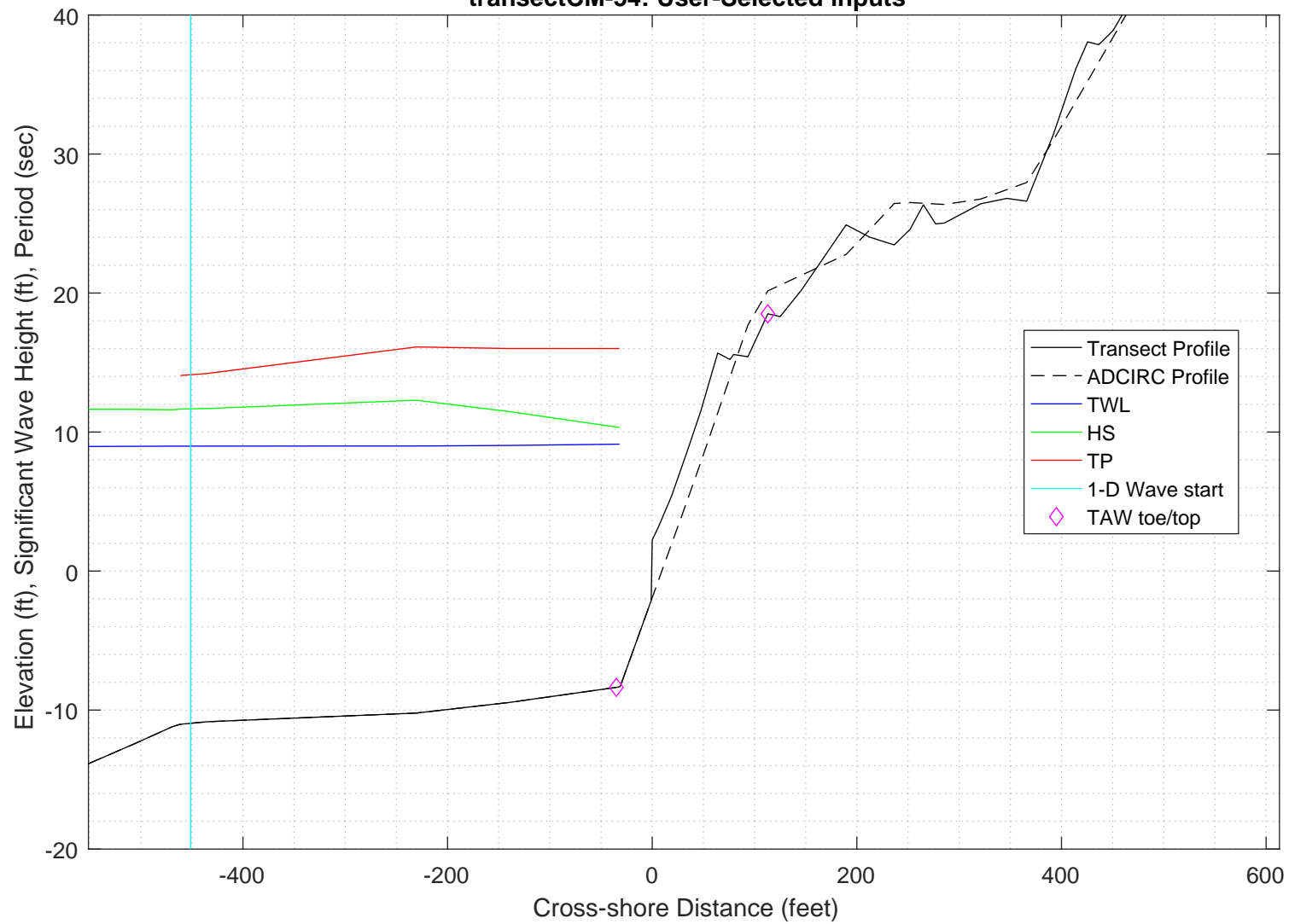
```
_____
PART 2: SWAN 1-D

swan input grid name: 2_swan/gridfiles/CM-54zmeters_xmeters.grd
swan file name:       2_swan/swanfiles/CM-54.swn
swan output name:     2_swan/swanfiles/CM-54.dat

Boundary Conditions:
    TWL- 2.7394 meters
    HS-  3.5563 meters
    PER- 14.124 seconds

Batch File: 2_swan/swanfiles/runswan.dat

SWAN maximum additional wave setup: 2.2367 feet
SWAN output at toe:
    SETUP- 0.22642 feet
    HS-    9.2313 feet
    PER-   13.882 seconds

PART 2 COMPLETE_____
```
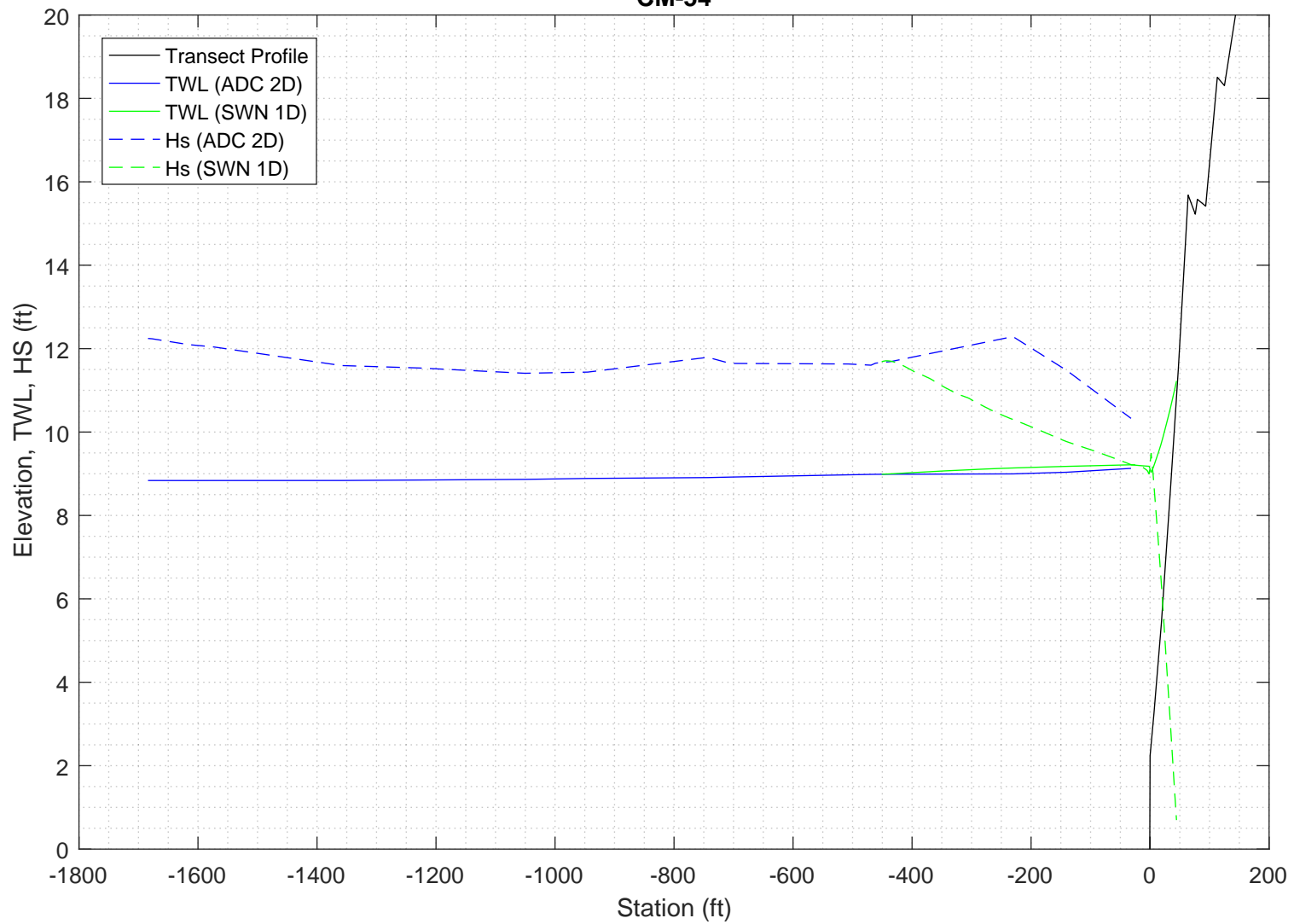
2-D ADCIRC+SWAN and SWAN 1-D results, Transect: CM-54

Legend:
- Transect Profile
- TWL (ADC 2D)
- TWL (SWN 1D)
- Hs (ADC 2D)
- Hs (SWN 1D)

X-axis: Station (ft)
Y-axis: Elevation, TWL, HS (ft)

Execution started at 20200416.132457


```
                     ---------------------------------------
                                     SWAN
                     SIMULATION OF WAVES IN NEAR SHORE AREAS
                            VERSION NUMBER 41.20A
                     ---------------------------------------
```


PROJECT '2018FemaAppeal' '1'

    '100-year Wind and Wave conditions'

! -- SET commands --

 SET DEPMIN=0.01 MAXMES=999 MAXERR=3 PWTAIL=4

 SET LEVEL 0

 SET CARTESIAN

! -- MODE commands ---

 MODE STATIONARY ONED

!-- COORDINATES commands---

COORDINATES CART

!

! -- computational (CGRID) grid commands --------------------------------------

!   xlenc=length of grid in meters

! mxc = number of mesh cells (one less than number of grid points)

!CGRID REGular [xpc] [ypc] [alpc] [xlenc]   [ylenc] [mxc] [myc] &

!   [CIRcle|SECtor[dir1] [dir2]] [mdc] [flow] [fhigh] [msc]

 CGRID REGULAR   0   0   0   151   0.   151   0   &
          CIRCLE   36   0.03   0.8   30
Resolution in sigma-space: df/f = 0.1157

! -- READgrid ---- not used in 1-D mode ------------------------------------

! -- INPgrid commands ---

!INPgrid BOTtom REGular [xpinp] [ypinp] [alpinp] [mxinp] [myinp] [dxinp] [dyinp]

!

 INPGRID BOTTOM REGULAR   0   0   0   151   0   1   1

!READinp BOTtom [fac] 'fname1' [idla] [nhedf] [FREe|FORmat[form]|UNFormatted]

 READ   BOTTOM   -1. '../gridfiles/CM-54zmeters_xmeters.grd'   1   0   FREE

!--

! -- WIND [vel] [dir]

WIND   25.1 0

! -- BOUnd SHAPespec

BOUND SHAPE JONSWAP 3.3 PEAK DSPR POWER

! -- BOUndspec

! BOU SIDE W CCW CON FILE 'swanspec.txt' 1

BOUN SIDE W CCW CONSTANT PAR   3.5563   14.124   0 2

!-- BOUndnest1 - optional for boundary from parent run

!-- BOUndnest2

!-- BOUndnest3

!-- INITial -- usest to specify initial values

!

```
!--------------- P H Y S I C S ------------------------

!-- GEN1 [cf10] [cf20] [cf30] [cf40] [edm1pm] [cdrag] [umin] [cfpm]

!-- GEN2 [cf10] [cf20] [cf30] [cf40] [cf50] [cf60] [edm1pm] [cdrag] [umin] [cfpm]

    GEN3 KOMEN

!   whitecapping ( on by default)

!-- WCAPping KOMen [cds2] [stpm] [powst] [delta] [powk]

    WCAP KOM

!   quadruplet wave interactions

!-- QUADrupl [iquad] [lambda] [Cn14] [Csh1] [Csh2]

! -- BREaking CONstant [alpha] [gamma]

     BREAK    CON      1.      0.73

!-- FRICtion JONswap CONstant [cfjon]

    FRIC    JONSWAP CON      0.038

!-- TRIad [itriad] [trfac] [cutfr]   [a]  [b]  [urcrit] [urslim]

! TRIAD       1     0.65    2.5     0.95 -0.75  0.2       0.01

   TRIAD

!-- VEGEtation [height] [diamtr] [nstems] [drag]

!-- MUD [layer] [rhom] [viscm]

!- LIMiter [ursell] [qb] deactivates quadruplets with Ursell number exceeds ursell

!-- OBSTacle -- not in 1-D

!-- SETUP [supcor]

   SETUP    0

!

! --------------- N U M E R I C S -----------------------------

!

!-- PROP  can use BBST or GSE instead of default

! -- NUMeric -- lots of options

!     NUM ACCUR npnts=100. stat 30

    NUMeric STOPC

!

! ------------------O U T P U T -------------------------------

!

!OUTPut OPTIons "comment' (TABLE [field]) (BLOck [ndec] [len]) (SPEC [ndec])

 OUTPUT OPTIONS '%' TABLE 16

 $BLOCK 9 1000 SPEC 8

!CURve 'sname' [xp1] [yp1] <[int]   [xp]   [yp] >

 CURVE 'curve' 0     0       151   151     0

!TABLe 'sname' < HEADer|NOHEADer|INDexed > 'fname' <output parameters> (output time)

 Table 'curve'   HEADER 'CM-54.dat' XP YP HSIGN TPS RTP TMM10 DIR &
 DSPR DEPTH SETUP

!QUANTITY XP hexp=99999

!

!-----------------------------------------

 COMPUTE STATIONARY

-----------------------------------------------------------------
                COMPUTATIONAL PART OF SWAN
-----------------------------------------------------------------
```

```
One-dimensional mode of SWAN is activated
Gridresolution        : MXC              152 MYC                 1
                       : MCGRD            153
                       : MSC               31 MDC                36
                       : MTC               1
                       : NSTATC            0 ITERMX             50
Propagation flags     : ITFRE             1 IREFR               1
Source term flags     : IBOT              1 ISURF              1
                       : IWCAP             1 IWIND              3
                       : ITRIAD            1 IQUAD              2
                       : IVEG              0 ITURBV             0
                       : IMUD              0
Spatial step          : DX         0.1000E+01 DY         0.1000E+01
Spectral bin          : df/f       0.1157E+00 DDIR       0.1000E+02
Physical constants    : GRAV       0.9810E+01 RHO        0.1025E+04
Wind input            : WSPEED     0.2510E+02 DIR        0.0000E+00
Tail parameters       : E(f)       0.4000E+01 E(k)       0.2500E+01
                       : A(f)       0.5000E+01 A(k)       0.3000E+01
Accuracy parameters   : DREL       0.1000E-01 NPNTS      0.9950E+02
                       : DHABS      0.0000E+00 CURVAT     0.5000E-02
                       : GRWMX      0.1000E+00
Drying/flooding       : LEVEL      0.0000E+00 DEPMIN     0.1000E-01
The Cartesian convention for wind and wave directions is used
Scheme for geographic propagation is SORDUP
Scheme geogr. space   : PROPSC            2 ICMAX              7
Scheme spectral space: CSS        0.5000E+00 CDD        0.5000E+00
Current is off
Quadruplets           : IQUAD             2
                       : LAMBDA     0.2500E+00 CNL4       0.3000E+08
                       : CSH1       0.5500E+01 CSH2       0.8330E+00
                       : CSH3      -0.1250E+01
Maximum Ursell nr for Snl4 :    0.1000E+02
Triads                : ITRIAD            1 TRFAC      0.8000E+00
                       : CUTFR      0.2500E+01 URCRI      0.2000E+00
Minimum Ursell nr for Snl3 :    0.1000E-01
JONSWAP ('73)         : GAMMA      0.3800E-01
Vegetation is off
Turbulence is off
Fluid mud is off
W-cap Komen ('84)     : EMPCOF (CDS2):   0.2360E-04
W-cap Komen ('84)     : APM (STPM)   :   0.3020E-02
W-cap Komen ('84)     : POWST        :   0.2000E+01
W-cap Komen ('84)     : DELTA        :   0.1000E+01
W-cap Komen ('84)     : POWK         :   0.1000E+01
Wind drag is fit
Snyder/Komen wind input
Battjes&Janssen ('78): ALPHA      0.1000E+01 GAMMA      0.7300E+00
Set-up                : SUPCOR     0.0000E+00
Diffraction is off
Janssen ('89,'90)     : ALPHA      0.1000E-01 KAPPA      0.4100E+00
Janssen ('89,'90)     : RHOA       0.1280E+01 RHOW       0.1025E+04

1st and 2nd gen. wind: CF10       0.1880E+03 CF20       0.5900E+00
                       : CF30       0.1200E+00 CF40       0.2500E+03
                       : CF50       0.2300E-02 CF60      -0.2230E+00
                       : CF70       0.0000E+00 CF80      -0.5600E+00
                       : RHOAW      0.1249E-02 EDMLPM     0.3600E-02
                       : CDRAG      0.1230E-02 UMIN       0.1000E+01
                       : LIM_PM     0.1300E+00

  -----------------------------------------------------------------
  First guess by 2nd generation model flags for first iteration:
  ITER      1 GRWMX       0.1000E+23 ALFA        0.0000E+00
  IWIND     2 IWCAP       0 IQUAD       0
  ITRIAD    1 IBOT        1 ISURF       1
  IVEG      0 ITURBV      0 IMUD        0
  -----------------------------------------------------------------
iteration    1; sweep 1
iteration    1; sweep 2
iteration    1; sweep 3
iteration    1; sweep 4
not possible to compute, first iteration

  -----------------------------------------------------------------
  Options given by user are activated for proceeding calculation:
  ITER      2 GRWMX       0.1000E+00 ALFA        0.0000E+00
  IWIND     3 IWCAP       1 IQUAD       2
  ITRIAD    1 IBOT        1 ISURF       1
  IVEG      0 ITURBV      0 IMUD        0
  -----------------------------------------------------------------
iteration    2; sweep 1
iteration    2; sweep 2
iteration    2; sweep 3
iteration    2; sweep 4
accuracy OK in   5.93 % of wet grid points ( 99.50 % required)

iteration    3; sweep 1
iteration    3; sweep 2
iteration    3; sweep 3
```

```
iteration     3; sweep 4
accuracy OK in    0.66 % of wet grid points ( 99.50 % required)

iteration     4; sweep 1
iteration     4; sweep 2
iteration     4; sweep 3
iteration     4; sweep 4
accuracy OK in    4.61 % of wet grid points ( 99.50 % required)

iteration     5; sweep 1
iteration     5; sweep 2
iteration     5; sweep 3
iteration     5; sweep 4
accuracy OK in   22.37 % of wet grid points ( 99.50 % required)

iteration     6; sweep 1
iteration     6; sweep 2
iteration     6; sweep 3
iteration     6; sweep 4
accuracy OK in   96.72 % of wet grid points ( 99.50 % required)

iteration     7; sweep 1
iteration     7; sweep 2
iteration     7; sweep 3
iteration     7; sweep 4
accuracy OK in   97.37 % of wet grid points ( 99.50 % required)

iteration     8; sweep 1
iteration     8; sweep 2
iteration     8; sweep 3
iteration     8; sweep 4
accuracy OK in   98.03 % of wet grid points ( 99.50 % required)

iteration     9; sweep 1
iteration     9; sweep 2
iteration     9; sweep 3
iteration     9; sweep 4
accuracy OK in   97.37 % of wet grid points ( 99.50 % required)

iteration    10; sweep 1
iteration    10; sweep 2
iteration    10; sweep 3
iteration    10; sweep 4
accuracy OK in   99.35 % of wet grid points ( 99.50 % required)

iteration    11; sweep 1
iteration    11; sweep 2
iteration    11; sweep 3
iteration    11; sweep 4
accuracy OK in   99.35 % of wet grid points ( 99.50 % required)

iteration    12; sweep 1
iteration    12; sweep 2
iteration    12; sweep 3
iteration    12; sweep 4
accuracy OK in  100.00 % of wet grid points ( 99.50 % required)


STOP
```

```
%
%
%
% Run:1      Table:curve              SWAN version:41.20A
%
%
%     Xp           Yp           Hsig         TPsmoo       RTpeak       Tm_10        Dir          Dspr         Depth        Setup
%     [m]          [m]          [m]          [sec]        [sec]        [sec]        [degr]       [degr]       [m]          [m]
%
       0.           0.          3.56238      13.8602      13.8874      12.7503       0.000       31.5056       6.0800       0.000000
       1.           0.          3.56630      13.8647      13.8874      12.4971       0.000       31.4602       6.0706       0.000624
       2.           0.          3.56888      13.8689      13.8874      12.2723       0.000       31.4235       6.0613       0.001264
       3.           0.          3.56857      13.8726      13.8874      12.0790       0.000       31.3839       6.0620       0.002042
       4.           0.          3.56741      13.8758      13.8874      11.9141       0.000       31.3220       6.0527       0.002720
       5.           0.          3.56506      13.8786      13.8874      11.7720       0.000       31.2675       6.0434       0.003414
       6.           0.          3.56126      13.8810      13.8874      11.6456       0.000       31.2336       6.0442       0.004235
       7.           0.          3.55645      13.8830      13.8874      11.5343       0.000       31.1867       6.0451       0.005062
       8.           0.          3.55187      13.8848      13.8874      11.4362       0.000       31.1344       6.0358       0.005779
       9.           0.          3.54591      13.8864      13.8874      11.3484       0.000       31.0978       6.0366       0.006614
      10.           0.          3.53921      13.8877      13.8874      11.2700       0.000       31.0482       6.0374       0.007449
      11.           0.          3.53301      13.8889      13.8874      11.2001       0.000       30.9938       6.0282       0.008169
      12.           0.          3.52571      13.8899      13.8874      11.1364       0.000       30.9555       6.0290       0.009000
      13.           0.          3.51824      13.8907      13.8874      11.0786       0.000       30.9221       6.0298       0.009824
      14.           0.          3.51024      13.8915      13.8874      11.0260       0.000       30.8734       6.0306       0.010643
      15.           0.          3.50293      13.8921      13.8874      10.9787       0.000       30.8194       6.0213       0.011345
      16.           0.          3.49475      13.8926      13.8874      10.9345       0.000       30.7812       6.0222       0.012152
      17.           0.          3.48624      13.8931      13.8874      10.8940       0.000       30.7316       6.0230       0.012952
      18.           0.          3.48067      13.8935      13.8874      10.8426       0.000       30.6874       6.0136       0.013643
      19.           0.          3.47484      13.8937      13.8874      10.7891       0.000       30.6606       6.0144       0.014445
      20.           0.          3.46874      13.8938      13.8874      10.7375       0.000       30.6223       6.0152       0.015245
      21.           0.          3.46326      13.8939      13.8874      10.6894       0.000       30.5803       6.0059       0.015936
      22.           0.          3.45685      13.8938      13.8874      10.6433       0.000       30.5514       6.0067       0.016733
      23.           0.          3.45001      13.8937      13.8874      10.5999       0.000       30.5113       6.0075       0.017526
      24.           0.          3.44378      13.8935      13.8874      10.5599       0.000       30.4677       5.9982       0.018209
      25.           0.          3.43643      13.8932      13.8874      10.5223      359.999       30.4395       5.9990       0.019008
      26.           0.          3.42826      13.8929      13.8874      10.4900      359.989       30.4201       5.9998       0.019834
      27.           0.          3.41946      13.8926      13.8874      10.4607      359.973       30.3863       6.0007       0.020661
      28.           0.          3.41132      13.8922      13.8874      10.4342      359.956       30.3478       5.9914       0.021377
      29.           0.          3.40241      13.8918      13.8874      10.4086      359.935       30.3212       5.9922       0.022192
      30.           0.          3.39325      13.8913      13.8874      10.3845      359.913       30.2840       5.9930       0.022998
      31.           0.          3.38489      13.8908      13.8874      10.3626      359.891       30.2444       5.9837       0.023691
      32.           0.          3.37688      13.8903      13.8874      10.3370      359.884       30.2146       5.9844       0.024437
      33.           0.          3.36901      13.8898      13.8874      10.3113      359.882       30.1741       5.9852       0.025160
      34.           0.          3.36201      13.8892      13.8874      10.2873      359.881       30.1310       5.9758       0.025769
      35.           0.          3.35439      13.8886      13.8874      10.2632      359.881       30.1001       5.9765       0.026472
      36.           0.          3.34685      13.8881      13.8874      10.2402      359.882       30.0732       5.9772       0.027164
      37.           0.          3.33910      13.8875      13.8874      10.2182      359.882       30.0337       5.9778       0.027847
      38.           0.          3.33209      13.8869      13.8874      10.1981      359.882       29.9913       5.9684       0.028424
      39.           0.          3.32502      13.8862      13.8874      10.1734      359.868       29.9666       5.9691       0.029116
      40.           0.          3.31913      13.8857      13.8874      10.1411      359.872       29.9355       5.9698       0.029803
      41.           0.          3.31461      13.8851      13.8874      10.1071      359.874       29.9021       5.9604       0.030379
      42.           0.          3.30946      13.8846      13.8874      10.0724      359.875       29.8800       5.9610       0.031049
      43.           0.          3.30405      13.8841      13.8874      10.0388      359.877       29.8476       5.9617       0.031713
      44.           0.          3.29917      13.8837      13.8874      10.0078      359.878       29.8123       5.9523       0.032279
      45.           0.          3.29235      13.8832      13.8874       9.9817      359.880       29.7969       5.9530       0.032986
      46.           0.          3.28386      13.8829      13.8874       9.9625      359.880       29.7781       5.9537       0.033737
      47.           0.          3.27565      13.8825      13.8874       9.9469      359.881       29.7551       5.9444       0.034396
      48.           0.          3.26779      13.8822      13.8874       9.9272      359.895       29.7377       5.9451       0.035107
      49.           0.          3.26019      13.8819      13.8874       9.9076      359.887       29.7230       5.9458       0.035798
      50.           0.          3.25246      13.8817      13.8874       9.8884      359.867       29.6940       5.9465       0.036476
      51.           0.          3.24552      13.8814      13.8874       9.8707      359.846       29.6615       5.9370       0.037048
      52.           0.          3.23807      13.8812      13.8874       9.8521      359.825       29.6400       5.9377       0.037705
      53.           0.          3.23053      13.8810      13.8874       9.8341      359.805       29.6102       5.9384       0.038352
      54.           0.          3.22367      13.8808      13.8874       9.8179      359.785       29.5777       5.9289       0.038899
      55.           0.          3.21629      13.8806      13.8874       9.8009      359.766       29.5562       5.9295       0.039531
      56.           0.          3.20882      13.8805      13.8874       9.7844      359.747       29.5265       5.9302       0.040154
      57.           0.          3.20200      13.8803      13.8874       9.7699      359.728       29.4937       5.9207       0.040679
      58.           0.          3.19466      13.8802      13.8874       9.7545      359.708       29.4713       5.9213       0.041289
      59.           0.          3.18806      13.8801      13.8874       9.7363      359.702       29.4397       5.9219       0.041861
```

60.	0.	3.18239	13.8799	13.8874	9.7187	359.701	29.4053	5.9123	0.042329
61.	0.	3.17625	13.8798	13.8874	9.7001	359.701	29.3817	5.9129	0.042880
62.	0.	3.17020	13.8797	13.8874	9.6820	359.702	29.3617	5.9134	0.043423
63.	0.	3.16400	13.8796	13.8874	9.6644	359.702	29.3315	5.9140	0.043958
64.	0.	3.15841	13.8796	13.8874	9.6486	359.703	29.2987	5.9044	0.044402
65.	0.	3.15229	13.8795	13.8874	9.6320	359.703	29.2764	5.9049	0.044930
66.	0.	3.14637	13.8794	13.8874	9.6139	359.704	29.2474	5.9055	0.045452
67.	0.	3.14116	13.8794	13.8874	9.5972	359.705	29.2163	5.8959	0.045882
68.	0.	3.13527	13.8793	13.8874	9.5793	359.706	29.1853	5.8964	0.046398
69.	0.	3.12985	13.8793	13.8874	9.5632	359.707	29.1442	5.8868	0.046825
70.	0.	3.12432	13.8792	13.8874	9.5474	359.708	29.1000	5.8773	0.047251
71.	0.	3.11871	13.8792	13.8874	9.5320	359.708	29.0551	5.8677	0.047678
72.	0.	3.11305	13.8792	13.8874	9.5170	359.709	29.0101	5.8581	0.048105
73.	0.	3.10749	13.8792	13.8874	9.5024	359.710	28.9749	5.8485	0.048532
74.	0.	3.10132	13.8791	13.8874	9.4867	359.711	28.9440	5.8490	0.049043
75.	0.	3.09565	13.8791	13.8874	9.4729	359.711	28.9044	5.8395	0.049464
76.	0.	3.08989	13.8791	13.8874	9.4593	359.712	28.8624	5.8299	0.049885
77.	0.	3.08401	13.8792	13.8874	9.4464	359.715	28.8202	5.8203	0.050309
78.	0.	3.07813	13.8792	13.8874	9.4335	359.716	28.7778	5.8107	0.050731
79.	0.	3.07238	13.8792	13.8874	9.4210	359.718	28.7450	5.8012	0.051151
80.	0.	3.06600	13.8792	13.8874	9.4075	359.718	28.7168	5.8017	0.051656
81.	0.	3.06014	13.8792	13.8874	9.3957	359.720	28.6800	5.7921	0.052072
82.	0.	3.05422	13.8792	13.8874	9.3841	359.721	28.6408	5.7825	0.052487
83.	0.	3.04823	13.8793	13.8874	9.3729	359.722	28.6012	5.7729	0.052902
84.	0.	3.04220	13.8793	13.8874	9.3620	359.722	28.5617	5.7633	0.053317
85.	0.	3.03614	13.8793	13.8874	9.3513	359.723	28.5224	5.7537	0.053732
86.	0.	3.03019	13.8794	13.8874	9.3411	359.723	28.4926	5.7441	0.054146
87.	0.	3.02367	13.8794	13.8874	9.3296	359.723	28.4670	5.7446	0.054643
88.	0.	3.01767	13.8794	13.8874	9.3198	359.723	28.4328	5.7350	0.055050
89.	0.	3.01172	13.8795	13.8874	9.3098	359.724	28.3956	5.7255	0.055453
90.	0.	3.00577	13.8795	13.8874	9.2998	359.726	28.3576	5.7159	0.055854
91.	0.	2.99981	13.8796	13.8874	9.2900	359.728	28.3193	5.7063	0.056254
92.	0.	2.99399	13.8796	13.8874	9.2804	359.730	28.2903	5.6967	0.056653
93.	0.	2.98764	13.8796	13.8874	9.2694	359.733	28.2652	5.6971	0.057132
94.	0.	2.98212	13.8797	13.8874	9.2588	359.740	28.2294	5.6875	0.057511
95.	0.	2.97684	13.8797	13.8874	9.2472	359.752	28.1900	5.6779	0.057878
96.	0.	2.97183	13.8798	13.8874	9.2347	359.769	28.1491	5.6682	0.058234
97.	0.	2.96693	13.8799	13.8874	9.2218	359.790	28.1081	5.6586	0.058584
98.	0.	2.96216	13.8799	13.8874	9.2085	359.816	28.0688	5.6489	0.058930
99.	0.	2.95738	13.8800	13.8874	9.1953	359.842	28.0300	5.6393	0.059276
100.	0.	2.95259	13.8800	13.8874	9.1823	359.870	27.9914	5.6296	0.059622
101.	0.	2.94778	13.8801	13.8874	9.1693	359.898	27.9532	5.6200	0.059967
102.	0.	2.94297	13.8802	13.8874	9.1565	359.928	27.9153	5.6103	0.060313
103.	0.	2.93815	13.8802	13.8874	9.1438	359.957	27.8778	5.6007	0.060658
104.	0.	2.93335	13.8803	13.8874	9.1311	359.989	27.8410	5.5910	0.061001
105.	0.	2.92841	13.8804	13.8874	9.1184	0.021	27.7959	5.5813	0.061345
106.	0.	2.92402	13.8804	13.8874	9.1075	0.054	27.7470	5.5616	0.061606
107.	0.	2.91907	13.8805	13.8874	9.0949	0.086	27.7066	5.5520	0.061955
108.	0.	2.91415	13.8806	13.8874	9.0825	0.118	27.6688	5.5423	0.062305
109.	0.	2.90921	13.8806	13.8874	9.0703	0.150	27.6316	5.5327	0.062655
110.	0.	2.90418	13.8807	13.8874	9.0586	0.180	27.5951	5.5230	0.063007
111.	0.	2.89910	13.8808	13.8874	9.0473	0.210	27.5596	5.5134	0.063360
112.	0.	2.89394	13.8809	13.8874	9.0364	0.240	27.5250	5.5037	0.063715
113.	0.	2.88875	13.8809	13.8874	9.0257	0.269	27.4910	5.4941	0.064070
114.	0.	2.88355	13.8810	13.8874	9.0152	0.299	27.4571	5.4844	0.064425
115.	0.	2.87833	13.8811	13.8874	9.0049	0.329	27.4233	5.4748	0.064780
116.	0.	2.87308	13.8812	13.8874	8.9947	0.359	27.3897	5.4651	0.065135
117.	0.	2.86782	13.8812	13.8874	8.9848	0.388	27.3561	5.4555	0.065489
118.	0.	2.86252	13.8813	13.8874	8.9751	0.417	27.3223	5.4458	0.065843
119.	0.	2.85720	13.8814	13.8874	8.9656	0.446	27.2884	5.4362	0.066197
120.	0.	2.85187	13.8815	13.8874	8.9563	0.474	27.2543	5.4266	0.066551
121.	0.	2.84651	13.8815	13.8874	8.9472	0.503	27.2201	5.4169	0.066904
122.	0.	2.84113	13.8816	13.8874	8.9384	0.531	27.1858	5.4073	0.067257
123.	0.	2.83573	13.8817	13.8874	8.9297	0.559	27.1511	5.3976	0.067610
124.	0.	2.83031	13.8818	13.8874	8.9212	0.586	27.1162	5.3880	0.067962
125.	0.	2.82489	13.8818	13.8874	8.9128	0.613	27.0811	5.3783	0.068313
126.	0.	2.81946	13.8819	13.8874	8.9046	0.640	27.0457	5.3687	0.068664

127.	0.	2.81370	13.8820	13.8874	8.8963	0.667	26.9870	5.3590	0.069013
128.	0.	2.80760	13.8821	13.8874	8.8918	0.691	26.7722	5.3191	0.069107
129.	0.	2.80863	13.8824	13.8874	8.9129	0.716	26.3629	5.1178	0.067806
130.	0.	2.80779	13.8827	13.8874	8.9337	0.742	25.8669	4.9165	0.066484
131.	0.	2.80599	13.8831	13.8874	8.9559	0.769	25.3255	4.7051	0.065067
132.	0.	2.80169	13.8835	13.8874	8.9760	0.797	24.7627	4.5038	0.063811
133.	0.	2.79520	13.8840	13.8874	8.9952	0.827	24.1952	4.3027	0.062678
134.	0.	2.78768	13.8845	13.8874	9.0139	0.866	23.6134	4.0915	0.061504
135.	0.	2.77781	13.8851	13.8874	9.0263	0.915	22.9917	3.8905	0.060521
136.	0.	2.76663	13.8858	13.8874	9.0358	0.982	22.3353	3.6795	0.059525
137.	0.	2.74162	13.8866	13.8874	9.0385	1.021	20.4275	3.4785	0.058517
138.	0.	2.89411	13.8905	13.8874	9.3023	0.928	17.9964	1.9838	0.013764
139.	0.	2.74176	13.8959	13.8874	9.3334	1.067	16.9482	1.8655	0.045485
140.	0.	2.55725	13.9051	13.8874	9.4198	1.018	16.4717	1.7364	0.086353
141.	0.	2.37144	13.9180	13.8874	9.5140	0.709	16.1120	1.6083	0.128318
142.	0.	2.18579	13.9319	13.8874	9.6359	0.205	15.7192	1.4808	0.170806
143.	0.	1.99014	13.9514	13.8874	9.8117	359.498	15.2707	1.3463	0.216260
144.	0.	1.77431	13.9830	13.8874	10.0826	358.701	14.7962	1.1974	0.267438
145.	0.	1.55004	14.0238	13.8874	10.4278	358.110	14.2780	1.0418	0.321816
146.	0.	1.32683	14.0607	13.8874	10.8905	358.098	13.7520	0.8871	0.377087
147.	0.	1.10578	14.1104	13.8874	11.4041	358.425	13.4163	0.7335	0.433452
148.	0.	0.88640	17.7107	17.2856	12.0683	359.129	14.0370	0.5813	0.491348
149.	0.	0.65742	18.4203	19.2849	12.8574	359.717	15.1697	0.4235	0.553458
150.	0.	0.43028	18.6398	19.2849	13.5151	359.707	16.3755	0.2667	0.616684
151.	0.	0.21210	19.7048	19.2849	14.3588	356.644	17.6485	0.1118	0.681761

_____

PART 3: WHAFIS

WHAFIS input: CM-54.dat
WHAFIS output: CM-54.out

PART 3 COMPLETE_____
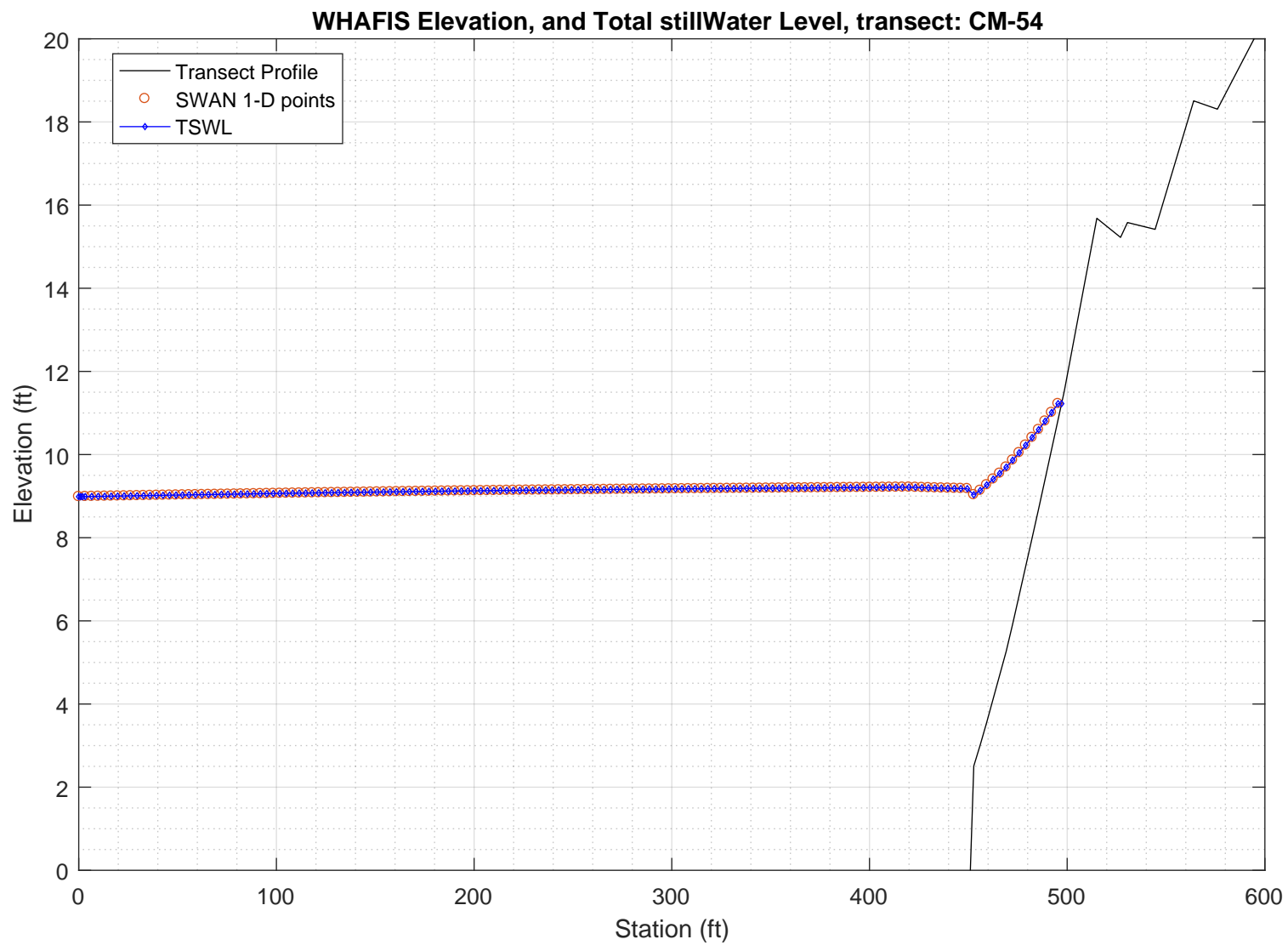
WHAFIS Elevation, and Total stillWater Level, transect: CM-54

Legend:
- Transect Profile
- SWAN 1-D points
- TSWL

Y-axis: Elevation (ft)
X-axis: Station (ft)

```
                                              header
                             THIS IS A 100-YEAR CASE
                THE FOLLOWING NON-DEFAULT WIND SPEEDS ARE BEING USED
                    WINDIF  56.14  WINDOF  56.14  WINDVH  60.00
                                          PART1 INPUT
        IE      0.000   -10.950    1.000    1.000    8.987   18.668   14.124   56.140    0.007    0.000
        OF      1.000   -10.943    0.000    8.988    0.000    0.000    0.000    0.000    0.007    0.000
        OF      2.000   -10.936    0.000    8.988    0.000    0.000    0.000    0.000    0.007    0.000
        OF      3.300   -10.927    0.000    8.990    0.000    0.000    0.000    0.000    0.007    0.000
        OF      6.600   -10.904    0.000    8.992    0.000    0.000    0.000    0.000    0.007    0.000
        OF      9.800   -10.881    0.000    8.994    0.000    0.000    0.000    0.000    0.007    0.000
        OF     13.100   -10.858    0.000    8.996    0.000    0.000    0.000    0.000    0.007    0.000
        OF     16.400   -10.838    0.000    8.999    0.000    0.000    0.000    0.000    0.004    0.000
        OF     19.700   -10.828    0.000    9.001    0.000    0.000    0.000    0.000    0.003    0.000
        OF     23.000   -10.818    0.000    9.004    0.000    0.000    0.000    0.000    0.003    0.000
        OF     26.200   -10.808    0.000    9.006    0.000    0.000    0.000    0.000    0.003    0.000
        OF     29.500   -10.798    0.000    9.009    0.000    0.000    0.000    0.000    0.003    0.000
        OF     32.800   -10.788    0.000    9.012    0.000    0.000    0.000    0.000    0.003    0.000
        OF     36.100   -10.777    0.000    9.014    0.000    0.000    0.000    0.000    0.003    0.000
        OF     39.400   -10.767    0.000    9.017    0.000    0.000    0.000    0.000    0.003    0.000
        OF     42.700   -10.757    0.000    9.020    0.000    0.000    0.000    0.000    0.003    0.000
        OF     45.900   -10.747    0.000    9.022    0.000    0.000    0.000    0.000    0.003    0.000
        OF     49.200   -10.737    0.000    9.025    0.000    0.000    0.000    0.000    0.003    0.000
        OF     52.500   -10.727    0.000    9.027    0.000    0.000    0.000    0.000    0.003    0.000
        OF     55.800   -10.717    0.000    9.030    0.000    0.000    0.000    0.000    0.003    0.000
        OF     59.100   -10.707    0.000    9.032    0.000    0.000    0.000    0.000    0.003    0.000
        OF     62.300   -10.697    0.000    9.035    0.000    0.000    0.000    0.000    0.003    0.000
        OF     65.600   -10.687    0.000    9.037    0.000    0.000    0.000    0.000    0.003    0.000
        OF     68.900   -10.677    0.000    9.040    0.000    0.000    0.000    0.000    0.003    0.000
        OF     72.200   -10.667    0.000    9.042    0.000    0.000    0.000    0.000    0.003    0.000
        OF     75.500   -10.657    0.000    9.045    0.000    0.000    0.000    0.000    0.003    0.000
        OF     78.700   -10.647    0.000    9.047    0.000    0.000    0.000    0.000    0.003    0.000
        OF     82.000   -10.637    0.000    9.050    0.000    0.000    0.000    0.000    0.003    0.000
        OF     85.300   -10.627    0.000    9.052    0.000    0.000    0.000    0.000    0.003    0.000
        OF     88.600   -10.617    0.000    9.055    0.000    0.000    0.000    0.000    0.003    0.000
        OF     91.900   -10.607    0.000    9.058    0.000    0.000    0.000    0.000    0.003    0.000
        OF     95.100   -10.597    0.000    9.060    0.000    0.000    0.000    0.000    0.003    0.000
        OF     98.400   -10.587    0.000    9.063    0.000    0.000    0.000    0.000    0.003    0.000
        OF    101.700   -10.577    0.000    9.065    0.000    0.000    0.000    0.000    0.003    0.000
        OF    105.000   -10.567    0.000    9.068    0.000    0.000    0.000    0.000    0.003    0.000
        OF    108.300   -10.557    0.000    9.070    0.000    0.000    0.000    0.000    0.003    0.000
        OF    111.500   -10.547    0.000    9.072    0.000    0.000    0.000    0.000    0.003    0.000
        OF    114.800   -10.537    0.000    9.074    0.000    0.000    0.000    0.000    0.003    0.000
        OF    118.100   -10.527    0.000    9.076    0.000    0.000    0.000    0.000    0.003    0.000
        OF    121.400   -10.517    0.000    9.079    0.000    0.000    0.000    0.000    0.003    0.000
        OF    124.700   -10.507    0.000    9.081    0.000    0.000    0.000    0.000    0.003    0.000
        OF    128.000   -10.497    0.000    9.083    0.000    0.000    0.000    0.000    0.003    0.000
        OF    131.200   -10.487    0.000    9.085    0.000    0.000    0.000    0.000    0.003    0.000
        OF    134.500   -10.477    0.000    9.087    0.000    0.000    0.000    0.000    0.003    0.000
        OF    137.800   -10.467    0.000    9.089    0.000    0.000    0.000    0.000    0.003    0.000
        OF    141.100   -10.457    0.000    9.092    0.000    0.000    0.000    0.000    0.003    0.000
        OF    144.400   -10.447    0.000    9.093    0.000    0.000    0.000    0.000    0.003    0.000
        OF    147.600   -10.437    0.000    9.096    0.000    0.000    0.000    0.000    0.003    0.000
        OF    150.900   -10.426    0.000    9.098    0.000    0.000    0.000    0.000    0.003    0.000
        OF    154.200   -10.416    0.000    9.100    0.000    0.000    0.000    0.000    0.003    0.000
        OF    157.500   -10.406    0.000    9.103    0.000    0.000    0.000    0.000    0.003    0.000
        OF    160.800   -10.396    0.000    9.105    0.000    0.000    0.000    0.000    0.003    0.000
        OF    164.000   -10.386    0.000    9.107    0.000    0.000    0.000    0.000    0.003    0.000
        OF    167.300   -10.376    0.000    9.109    0.000    0.000    0.000    0.000    0.003    0.000
        OF    170.600   -10.366    0.000    9.111    0.000    0.000    0.000    0.000    0.003    0.000
        OF    173.900   -10.356    0.000    9.113    0.000    0.000    0.000    0.000    0.003    0.000
        OF    177.200   -10.346    0.000    9.115    header    0.000    0.000    0.000    0.003    0.000
        OF    180.400   -10.336    0.000    9.117    0.000    0.000    0.000    0.000    0.003    0.000
        OF    183.700   -10.326    0.000    9.119    0.000    0.000    0.000    0.000    0.003    0.000
        OF    187.000   -10.316    0.000    9.121    0.000    0.000    0.000    0.000    0.003    0.000
        OF    190.300   -10.306    0.000    9.123    0.000    0.000    0.000    0.000    0.003    0.000
        OF    193.600   -10.296    0.000    9.125    0.000    0.000    0.000    0.000    0.003    0.000
        OF    196.800   -10.286    0.000    9.126    0.000    0.000    0.000    0.000    0.003    0.000
        OF    200.100   -10.276    0.000    9.128    0.000    0.000    0.000    0.000    0.003    0.000
        OF    203.400   -10.266    0.000    9.130    0.000    0.000    0.000    0.000    0.003    0.000
        OF    206.700   -10.256    0.000    9.132    0.000    0.000    0.000    0.000    0.003    0.000
        OF    210.000   -10.246    0.000    9.133    0.000    0.000    0.000    0.000    0.003    0.000
        OF    213.300   -10.236    0.000    9.135    0.000    0.000    0.000    0.000    0.003    0.000
        OF    216.500   -10.226    0.000    9.137    0.000    0.000    0.000    0.000    0.003    0.000
        OF    219.800   -10.216    0.000    9.138    0.000    0.000    0.000    0.000    0.005    0.000
        OF    223.100   -10.192    0.000    9.140    0.000    0.000    0.000    0.000    0.008    0.000
        OF    226.400   -10.165    0.000    9.141    0.000    0.000    0.000    0.000    0.008    0.000
        OF    229.700   -10.137    0.000    9.142    0.000    0.000    0.000    0.000    0.009    0.000
        OF    232.900   -10.110    0.000    9.144    0.000    0.000    0.000    0.000    0.009    0.000
        OF    236.200   -10.082    0.000    9.145    0.000    0.000    0.000    0.000    0.009    0.000
        OF    239.500   -10.054    0.000    9.147    0.000    0.000    0.000    0.000    0.008    0.000
        OF    242.800   -10.027    0.000    9.148    0.000    0.000    0.000    0.000    0.008    0.000
        OF    246.100   -10.000    0.000    9.150    0.000    0.000    0.000    0.000    0.008    0.000
        OF    249.300    -9.972    0.000    9.151    0.000    0.000    0.000    0.000    0.009    0.000
        OF    252.600    -9.945    0.000    9.153    0.000    0.000    0.000    0.000    0.008    0.000
        OF    255.900    -9.917    0.000    9.154    0.000    0.000    0.000    0.000    0.008    0.000
        OF    259.200    -9.889    0.000    9.155    0.000    0.000    0.000    0.000    0.008    0.000
        OF    262.500    -9.862    0.000    9.157    0.000    0.000    0.000    0.000    0.009    0.000
        OF    265.700    -9.834    0.000    9.158    0.000    0.000    0.000    0.000    0.009    0.000
        OF    269.000    -9.807    0.000    9.160    0.000    0.000    0.000    0.000    0.008    0.000
        OF    272.300    -9.779    0.000    9.161    0.000    0.000    0.000    0.000    0.008    0.000
        OF    275.600    -9.752    0.000    9.162    0.000    0.000    0.000    0.000    0.008    0.000
        OF    278.900    -9.724    0.000    9.164    0.000    0.000    0.000    0.000    0.008    0.000
        OF    282.200    -9.697    0.000    9.165    0.000    0.000    0.000    0.000    0.009    0.000
        OF    285.400    -9.669    0.000    9.167    0.000    0.000    0.000    0.000    0.009    0.000
        OF    288.700    -9.641    0.000    9.168    0.000    0.000    0.000    0.000    0.008    0.000
        OF    292.000    -9.614    0.000    9.169    0.000    0.000    0.000    0.000    0.008    0.000
        OF    295.300    -9.586    0.000    9.171    0.000    0.000    0.000    0.000    0.008    0.000
```

	Station									
OF	298.600	-9.559	0.000	9.172	0.000	0.000	0.000	0.000	0.009	0.000
OF	301.800	-9.531	0.000	9.173	0.000	0.000	0.000	0.000	0.009	0.000
OF	305.100	-9.504	0.000	9.175	0.000	0.000	0.000	0.000	0.008	0.000
OF	308.400	-9.476	0.000	9.176	0.000	0.000	0.000	0.000	0.009	0.000
OF	311.700	-9.447	0.000	9.177	0.000	0.000	0.000	0.000	0.010	0.000
OF	315.000	-9.413	0.000	9.179	0.000	0.000	0.000	0.000	0.010	0.000
OF	318.200	-9.379	0.000	9.180	0.000	0.000	0.000	0.000	0.010	0.000
OF	321.500	-9.345	0.000	9.181	0.000	0.000	0.000	0.000	0.010	0.000
OF	324.800	-9.311	0.000	9.182	0.000	0.000	0.000	0.000	0.010	0.000
OF	328.100	-9.277	0.000	9.183	0.000	0.000	0.000	0.000	0.010	0.000
OF	331.400	-9.243	0.000	9.184	0.000	0.000	0.000	0.000	0.010	0.000
OF	334.600	-9.209	0.000	9.185	0.000	0.000	0.000	0.000	0.010	0.000
OF	337.900	-9.175	0.000	9.186	0.000	0.000	0.000	0.000	0.010	0.000
OF	341.200	-9.141	0.000	9.188	0.000	0.000	0.000	0.000	0.010	0.000
OF	344.500	-9.107	0.000	9.189	0.000	0.000	0.000	0.000	0.010	0.000
OF	347.800	-9.073	0.000	9.189	0.000	0.000	0.000	0.000	0.010	0.000
OF	351.000	-9.039	0.000	9.191	0.000	0.000	0.000	0.000	0.010	0.000
OF	354.300	-9.005	0.000	9.192	0.000	0.000	0.000	0.000	0.010	0.000
OF	357.600	-8.971	0.000	9.193	0.000	0.000	0.000	0.000	0.010	0.000
OF	360.900	-8.937	0.000	9.194	0.000	0.000	0.000	0.000	0.010	0.000
OF	364.200	-8.903	0.000	9.195	0.000	0.000	0.000	0.000	0.010	0.000
OF	367.500	-8.869	0.000	9.196	0.000	0.000	0.000	0.000	0.010	0.000
OF	370.700	-8.835	0.000	9.198	0.000	0.000	0.000	0.000	0.010	0.000
OF	374.000	-8.801	0.000	9.199	0.000	0.000	0.000	0.000	0.010	0.000
OF	377.300	-8.767	0.000	9.200	0.000	0.000	0.000	0.000	0.010	0.000
OF	380.600	-8.733	0.000	9.201	0.000	0.000	0.000	0.000	0.010	0.000
OF	383.900	-8.699	0.000	9.202	0.000	0.000	0.000	0.000	0.010	0.000
OF	387.100	-8.665	0.000	9.203	0.000	0.000	0.000	0.000	0.010	0.000
OF	390.400	-8.631	0.000	9.205	0.000	0.000	0.000	0.000	0.010	0.000
OF	393.700	-8.597	0.000	9.206	0.000	0.000	0.000	0.000	0.010	0.000
OF	397.000	-8.563	0.000	9.207	0.000	0.000	0.000	0.000	0.010	0.000
OF	400.300	-8.529	0.000	9.208	0.000	0.000	0.000	0.000	0.010	0.000
OF	403.500	-8.495	0.000	9.209	0.000	0.000	0.000	0.000	0.010	0.000
OF	406.800	-8.461	0.000	9.210	0.000	0.000	0.000	0.000	0.010	0.000
OF	410.100	-8.427	0.000	9.212	0.000	0.000	0.000	0.000	0.010	0.000
OF	413.400	-8.393	0.000	9.213	0.000	0.000	0.000	0.000	0.010	0.000
OF	416.700	-8.359	0.000	9.214	0.000	0.000	0.000	0.000	0.022	0.000
OF	419.900	-8.252	0.000	9.214	0.000	0.000	0.000	0.000	0.119	0.000
OF	423.200	-7.588	0.000	9.210	0.000	0.000	0.000	0.000	0.202	0.000
OF	426.500	-6.918	0.000	9.205	0.000	0.000	0.000	0.000	0.203	0.000
OF	429.800	-6.248	0.000	9.201	0.000	0.000	0.000	0.000	0.203	0.000
OF	433.100	-5.578	0.000	9.197	0.000	0.000	0.000	0.000	0.203	0.000
OF	436.400	-4.908	0.000	9.193	0.000	0.000	0.000	0.000	0.206	0.000
OF	439.600	-4.238	0.000	9.189	0.000	0.000	0.000	0.000	0.206	0.000
OF	442.900	-3.568	0.000	9.186	0.000	0.000	0.000	0.000	0.203	0.000
OF	446.200	-2.898	0.000	9.183	0.000	0.000	0.000	0.000	0.203	0.000
OF	449.500	-2.228	0.000	9.179	0.000	0.000	0.000	0.000	0.819	0.000
IF	452.800	2.508	0.000	9.033	0.000	0.000	0.000	0.000	0.807	0.000
IF	456.000	3.020	0.000	9.137	0.000	0.000	0.000	0.000	0.162	0.000
IF	459.300	3.563	0.000	9.271	0.000	0.000	0.000	0.000	0.168	0.000
IF	462.600	4.131	0.000	9.408	0.000	0.000	0.000	0.000	0.172	0.000
IF	465.900	4.699	0.000	9.548	0.000	0.000	0.000	0.000	0.172	0.000
IF	469.200	5.268	0.000	9.697	0.000	0.000	0.000	0.000	0.189	0.000
IF	472.400	5.927	0.000	9.865	0.000	0.000	0.000	0.000	0.208	0.000
IF	475.700	6.617	0.000	10.043	0.000	0.000	0.000	0.000	0.209	0.000
IF	479.000	7.308	0.000	10.225	0.000	0.000	0.000	0.000	0.209	0.000
IF	482.300	7.998	0.000	10.410	0.000	0.000	0.000	0.000	0.210	0.000
IF	485.600	8.696	0.000	10.599	0.000	0.000	0.000	0.000	0.217	0.000
IF	488.800	9.411	0.000	10.803	0.000	0.000	0.000	0.000	0.220	0.000
IF	492.100	10.126	0.000	11.011	0.000	0.000	0.000	0.000	0.217	0.000
IF	495.400	10.841	0.000	11.224	0.000	0.000	0.000	0.000	0.215	0.000
IF	497.200	11.224	0.000	11.224	0.000	0.000	0.000	0.000	0.213	0.000
ET	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1

	END STATION	END ELEVATION	FETCH LENGTH	SURGE ELEV 10-YEAR	SURGE ELEV 100-YEAR	INITIAL WAVE HEIGHT	INITIAL W. PERIOD		BOTTOM SLOPE	AVERAGE A-ZONES
IE	0.000	-10.950	1.000	1.000	8.987	18.668	14.124	56.140	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	1.000	-10.943	0.000	8.988	0.000	0.000	0.000	0.000	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	2.000	-10.936	0.000	8.988	0.000	0.000	0.000	0.000	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	3.300	-10.927	0.000	8.990	0.000	0.000	0.000	0.000	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	6.600	-10.904	0.000	8.992	0.000	0.000	0.000	0.000	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	9.800	-10.881	0.000	8.994	0.000	0.000	0.000	0.000	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	13.100	-10.858	0.000	8.996	0.000	0.000	0.000	0.000	0.007	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	16.400	-10.838	0.000	8.999	0.000	0.000	0.000	0.000	0.004	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	19.700	-10.828	0.000	9.001	0.000	0.000	0.000	0.000	0.003	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	23.000	-10.818	0.000	9.004	0.000	0.000	0.000	0.000	0.003	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	26.200	-10.808	0.000	9.006	0.000	0.000	0.000	0.000	0.003	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	29.500	-10.798	0.000	9.009	0.000	0.000	0.000	0.000	0.003	0.000

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES

```
OF     32.800    -10.788     0.000     9.012     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     36.100    -10.777     0.000     9.014     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     39.400    -10.767     0.000     9.017     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     42.700    -10.757     0.000     9.020     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     45.900    -10.747     0.000     9.022     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     49.200    -10.737     0.000     9.025     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     52.500    -10.727     0.000     9.027     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     55.800    -10.717     0.000     9.030     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     59.100    -10.707     0.000     9.032     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     62.300    -10.697     0.000     9.035     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     65.600    -10.687     0.000     9.037     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     68.900    -10.677     0.000     9.040     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     72.200    -10.667     0.000     9.042     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     75.500    -10.657     0.000     9.045     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     78.700    -10.647     0.000     9.047     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     82.000    -10.637     0.000     9.050     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     85.300    -10.627     0.000     9.052     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     88.600    -10.617     0.000     9.055     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     91.900    -10.607     0.000     9.058     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     95.100    -10.597     0.000     9.060     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF     98.400    -10.587     0.000     9.063     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    101.700    -10.577     0.000     9.065     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    105.000    -10.567     0.000     9.068     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    108.300    -10.557     0.000     9.070     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    111.500    -10.547     0.000     9.072     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    114.800    -10.537     0.000     9.074     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    118.100    -10.527     0.000     9.076     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    121.400    -10.517     0.000     9.079     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    124.700    -10.507     0.000     9.081     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    128.000    -10.497     0.000     9.083     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    131.200    -10.487     0.000     9.085     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    134.500    -10.477     0.000     9.087     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    137.800    -10.467     0.000     9.089     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
OF    141.100    -10.457     0.000     9.092     0.000     0.000     0.000     0.000     0.003     0.000
       END         END    NEW SURGE  NEW SURGE                                          BOTTOM    AVERAGE
       STATION   ELEVATION   10-YEAR   100-YEAR                                          SLOPE    A-ZONES
```

	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	144.400	-10.447	0.000	9.093	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	147.600	-10.437	0.000	9.096	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	150.900	-10.426	0.000	9.098	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	154.200	-10.416	0.000	9.100	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	157.500	-10.406	0.000	9.103	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	160.800	-10.396	0.000	9.105	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	164.000	-10.386	0.000	9.107	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	167.300	-10.376	0.000	9.109	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	170.600	-10.366	0.000	9.111	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	173.900	-10.356	0.000	9.113	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	177.200	-10.346	0.000	9.115	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	180.400	-10.336	0.000	9.117	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	183.700	-10.326	0.000	9.119	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	187.000	-10.316	0.000	9.121	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	190.300	-10.306	0.000	9.123	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	193.600	-10.296	0.000	9.125	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	196.800	-10.286	0.000	9.126	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	200.100	-10.276	0.000	9.128	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	203.400	-10.266	0.000	9.130	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	206.700	-10.256	0.000	9.132	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	210.000	-10.246	0.000	9.133	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	213.300	-10.236	0.000	9.135	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	216.500	-10.226	0.000	9.137	0.000	0.000	0.000	0.000	0.003	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	219.800	-10.216	0.000	9.138	0.000	0.000	0.000	0.000	0.005	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	223.100	-10.192	0.000	9.140	0.000	0.000	0.000	0.000	0.008	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	226.400	-10.165	0.000	9.141	0.000	0.000	0.000	0.000	0.008	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	229.700	-10.137	0.000	9.142	0.000	0.000	0.000	0.000	0.009	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	232.900	-10.110	0.000	9.144	0.000	0.000	0.000	0.000	0.009	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	236.200	-10.082	0.000	9.145	0.000	0.000	0.000	0.000	0.009	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	239.500	-10.054	0.000	9.147	0.000	0.000	0.000	0.000	0.008	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	242.800	-10.027	0.000	9.148	0.000	0.000	0.000	0.000	0.008	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	246.100	-10.000	0.000	9.150	0.000	0.000	0.000	0.000	0.008	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	249.300	-9.972	0.000	9.151	0.000	0.000	0.000	0.000	0.009	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	252.600	-9.945	0.000	9.153	0.000	0.000	0.000	0.000	0.008	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES

```
OF    255.900    -9.917     0.000     9.154     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    259.200    -9.889     0.000     9.155     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    262.500    -9.862     0.000     9.157     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    265.700    -9.834     0.000     9.158     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    269.000    -9.807     0.000     9.160     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    272.300    -9.779     0.000     9.161     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    275.600    -9.752     0.000     9.162     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    278.900    -9.724     0.000     9.164     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    282.200    -9.697     0.000     9.165     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    285.400    -9.669     0.000     9.167     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    288.700    -9.641     0.000     9.168     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    292.000    -9.614     0.000     9.169     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    295.300    -9.586     0.000     9.171     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    298.600    -9.559     0.000     9.172     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    301.800    -9.531     0.000     9.173     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    305.100    -9.504     0.000     9.175     0.000     0.000     0.000     0.000          0.008     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    308.400    -9.476     0.000     9.176     0.000     0.000     0.000     0.000          0.009     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    311.700    -9.447     0.000     9.177     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    315.000    -9.413     0.000     9.179     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    318.200    -9.379     0.000     9.180     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    321.500    -9.345     0.000     9.181     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    324.800    -9.311     0.000     9.182     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    328.100    -9.277     0.000     9.183     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    331.400    -9.243     0.000     9.184     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    334.600    -9.209     0.000     9.185     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    337.900    -9.175     0.000     9.186     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    341.200    -9.141     0.000     9.188     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    344.500    -9.107     0.000     9.189     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    347.800    -9.073     0.000     9.189     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    351.000    -9.039     0.000     9.191     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    354.300    -9.005     0.000     9.192     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    357.600    -8.971     0.000     9.193     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    360.900    -8.937     0.000     9.194     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
OF    364.200    -8.903     0.000     9.195     0.000     0.000     0.000     0.000          0.010     0.000
         END        END NEW SURGE NEW SURGE                                                 BOTTOM   AVERAGE
      STATION  ELEVATION    10-YEAR   100-YEAR                                                SLOPE   A-ZONES
```

	STATION	ELEVATION	10-YEAR	100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
OF	367.500	-8.869	0.000	9.196	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	370.700	-8.835	0.000	9.198	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	374.000	-8.801	0.000	9.199	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	377.300	-8.767	0.000	9.200	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	380.600	-8.733	0.000	9.201	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	383.900	-8.699	0.000	9.202	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	387.100	-8.665	0.000	9.203	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	390.400	-8.631	0.000	9.205	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	393.700	-8.597	0.000	9.206	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	397.000	-8.563	0.000	9.207	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	400.300	-8.529	0.000	9.208	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	403.500	-8.495	0.000	9.209	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	406.800	-8.461	0.000	9.210	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	410.100	-8.427	0.000	9.212	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	413.400	-8.393	0.000	9.213	0.000	0.000	0.000	0.000	0.010	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	416.700	-8.359	0.000	9.214	0.000	0.000	0.000	0.000	0.022	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	419.900	-8.252	0.000	9.214	0.000	0.000	0.000	0.000	0.119	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	423.200	-7.588	0.000	9.210	0.000	0.000	0.000	0.000	0.202	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	426.500	-6.918	0.000	9.205	0.000	0.000	0.000	0.000	0.203	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	429.800	-6.248	0.000	9.201	0.000	0.000	0.000	0.000	0.203	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	433.100	-5.578	0.000	9.197	0.000	0.000	0.000	0.000	0.203	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	436.400	-4.908	0.000	9.193	0.000	0.000	0.000	0.000	0.206	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	439.600	-4.238	0.000	9.189	0.000	0.000	0.000	0.000	0.206	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	442.900	-3.568	0.000	9.186	0.000	0.000	0.000	0.000	0.203	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	446.200	-2.898	0.000	9.183	0.000	0.000	0.000	0.000	0.203	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
OF	449.500	-2.228	0.000	9.179	0.000	0.000	0.000	0.000	0.819	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	452.800	2.508	0.000	9.033	0.000	0.000	0.000	0.000	0.807	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	456.000	3.020	0.000	9.137	0.000	0.000	0.000	0.000	0.162	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	459.300	3.563	0.000	9.271	0.000	0.000	0.000	0.000	0.168	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	462.600	4.131	0.000	9.408	0.000	0.000	0.000	0.000	0.172	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	465.900	4.699	0.000	9.548	0.000	0.000	0.000	0.000	0.172	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	469.200	5.268	0.000	9.697	0.000	0.000	0.000	0.000	0.189	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	472.400	5.927	0.000	9.865	0.000	0.000	0.000	0.000	0.208	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
IF	475.700	6.617	0.000	10.043	0.000	0.000	0.000	0.000	0.209	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES

	END STATION	END ELEVATION	NEW SURGE 10-YEAR	NEW SURGE 100-YEAR					BOTTOM SLOPE	AVERAGE A-ZONES
IF	479.000	7.308	0.000	10.225	0.000	0.000	0.000	0.000	0.209	0.000
IF	482.300	7.998	0.000	10.410	0.000	0.000	0.000	0.000	0.210	0.000
IF	485.600	8.696	0.000	10.599	0.000	0.000	0.000	0.000	0.217	0.000
IF	488.800	9.411	0.000	10.803	0.000	0.000	0.000	0.000	0.220	0.000
IF	492.100	10.126	0.000	11.011	0.000	0.000	0.000	0.000	0.217	0.000
IF	495.400	10.841	0.000	11.224	0.000	0.000	0.000	0.000	0.215	0.000
IF	497.200	11.224	0.000	11.224	0.000	0.000	0.000	0.000	0.213	0.000

```
--------------------------------------------END OF TRANSECT--------------------------------------------
```

NOTE:
SURGE ELEVATION INCLUDES CONTRIBUTIONS FROM ASTRONOMICAL AND STORM TIDES.

PART2: CONTROLLING WAVE HEIGHTS, SPECTRAL
PEAK WAVE PERIOD, AND WAVE CREST ELEVATIONS

	LOCATION	CONTROLLING WAVE HEIGHT	SPECTRAL PEAK WAVE PERIOD	WAVE CREST ELEVATION
IE	0.00	15.09	14.12	19.55
OF	1.00	15.08	14.12	19.55
OF	2.00	15.08	14.12	19.54
OF	3.30	15.07	14.12	19.54
OF	6.60	15.06	14.12	19.53
OF	9.80	15.04	14.12	19.52
OF	13.10	15.03	14.12	19.51
OF	16.40	15.01	14.12	19.51
OF	19.70	15.01	14.12	19.51
OF	23.00	15.00	14.12	19.51
OF	26.20	15.00	14.12	19.50
OF	29.50	14.99	14.12	19.50
OF	32.80	14.99	14.12	19.50
OF	36.10	14.98	14.12	19.50
OF	39.40	14.97	14.12	19.50
OF	42.70	14.97	14.12	19.50
OF	45.90	14.96	14.12	19.50
OF	49.20	14.96	14.12	19.50
OF	52.50	14.95	14.12	19.49
OF	55.80	14.95	14.12	19.49
OF	59.10	14.94	14.12	19.49
OF	62.30	14.94	14.12	19.49
OF	65.60	14.93	14.12	19.49
OF	68.90	14.92	14.12	19.49
OF	72.20	14.92	14.12	19.49
OF	75.50	14.91	14.12	19.48
OF	78.70	14.91	14.12	19.48
OF	82.00	14.90	14.12	19.48
OF	85.30	14.90	14.12	19.48
OF	88.60	14.89	14.12	19.48
OF	91.90	14.89	14.12	19.48
OF	95.10	14.88	14.12	19.48
OF	98.40	14.88	14.12	19.48
OF	101.70	14.87	14.12	19.47
OF	105.00	14.86	14.12	19.47
OF	108.30	14.86	14.12	19.47
OF	111.50	14.85	14.12	19.47
OF	114.80	14.85	14.12	19.47
OF	118.10	14.84	14.12	19.46
OF	121.40	14.84	14.12	19.46
OF	124.70	14.83	14.12	19.46
OF	128.00	14.82	14.12	19.46
OF	131.20	14.82	14.12	19.46
OF	134.50	14.81	14.12	19.46
OF	137.80	14.81	14.12	19.45
OF	141.10	14.80	14.12	19.45
OF	144.40	14.79	14.12	19.45
OF	147.60	14.79	14.12	19.45
OF	150.90	14.78	14.12	19.45
OF	154.20	14.78	14.12	19.44
OF	157.50	14.77	14.12	19.44
OF	160.80	14.77	14.12	19.44
OF	164.00	14.76	14.12	19.44
OF	167.30	14.75	14.12	19.44
OF	170.60	14.75	14.12	19.43
OF	173.90	14.74	14.12	19.43
OF	177.20	14.74	14.12	19.43
OF	180.40	14.73	14.12	19.43
OF	183.70	14.72	14.12	19.43
OF	187.00	14.72	14.12	19.42
OF	190.30	14.71	14.12	19.42
OF	193.60	14.71	14.12	19.42
OF	196.80	14.70	14.12	19.42
OF	200.10	14.69	14.12	19.41
OF	203.40	14.69	14.12	19.41
OF	206.70	14.68	14.12	19.41
OF	210.00	14.68	14.12	19.41
OF	213.30	14.67	14.12	19.40
OF	216.50	14.66	14.12	19.40
OF	219.80	14.66	14.12	19.40
OF	223.10	14.64	14.12	19.39
OF	226.40	14.62	14.12	19.38
OF	229.70	14.60	14.12	19.36
OF	232.90	14.58	14.12	19.35
OF	236.20	14.56	14.12	19.34

```
OF      239.50        14.55         14.12          19.33
OF      242.80        14.53         14.12          19.32
OF      246.10        14.51         14.12          19.31
OF      249.30        14.49         14.12          19.29
OF      252.60        14.47         14.12          19.28
OF      255.90        14.45         14.12          19.27
OF      259.20        14.43         14.12          19.26
OF      262.50        14.41         14.12          19.24
OF      265.70        14.39         14.12          19.23
OF      269.00        14.37         14.12          19.22
OF      272.30        14.35         14.12          19.21
OF      275.60        14.33         14.12          19.20
OF      278.90        14.31         14.12          19.18
OF      282.20        14.30         14.12          19.17
OF      285.40        14.28         14.12          19.16
OF      288.70        14.26         14.12          19.15
OF      292.00        14.24         14.12          19.14
OF      295.30        14.22         14.12          19.12
OF      298.60        14.20         14.12          19.11
OF      301.80        14.18         14.12          19.10
OF      305.10        14.16         14.12          19.09
OF      308.40        14.14         14.12          19.07
OF      311.70        14.12         14.12          19.06
OF      315.00        14.10         14.12          19.05
OF      318.20        14.07         14.12          19.03
OF      321.50        14.05         14.12          19.01
OF      324.80        14.02         14.12          19.00
OF      328.10        14.00         14.12          18.98
OF      331.40        13.98         14.12          18.97
OF      334.60        13.95         14.12          18.95
OF      337.90        13.93         14.12          18.93
OF      341.20        13.90         14.12          18.92
OF      344.50        13.88         14.12          18.90
OF      347.80        13.85         14.12          18.89
OF      351.00        13.83         14.12          18.87
OF      354.30        13.81         14.12          18.86
OF      357.60        13.78         14.12          18.84
OF      360.90        13.76         14.12          18.82
OF      364.20        13.73         14.12          18.81
OF      367.50        13.71         14.12          18.79
OF      370.70        13.68         14.12          18.78
OF      374.00        13.66         14.12          18.76
OF      377.30        13.64         14.12          18.75
OF      380.60        13.61         14.12          18.73
OF      383.90        13.59         14.12          18.71
OF      387.10        13.56         14.12          18.70
OF      390.40        13.54         14.12          18.68
OF      393.70        13.51         14.12          18.67
OF      397.00        13.49         14.12          18.65
OF      400.30        13.47         14.12          18.63
OF      403.50        13.44         14.12          18.62
OF      406.80        13.42         14.12          18.60
OF      410.10        13.39         14.12          18.59
OF      413.40        13.37         14.12          18.57
OF      416.70        13.34         14.12          18.56
OF      419.90        13.27         14.12          18.50
OF      423.20        12.77         14.12          18.15
OF      426.50        12.27         14.12          17.79
OF      429.80        11.77         14.12          17.44
OF      433.10        11.27         14.12          17.08
OF      436.40        10.76         14.12          16.73
OF      439.60        10.26         14.12          16.37
OF      442.90         9.76         14.12          16.02
OF      446.20         9.25         14.12          15.66
OF      449.50         8.74         14.12          15.30
IF      452.80         5.04         14.12          12.56
IF      456.00         4.73         14.12          12.45
IF      459.30         4.41         14.12          12.36
IF      462.60         4.08         14.12          12.27
IF      465.90         3.75         14.12          12.18
IF      469.20         3.43         14.12          12.10
IF      472.40         3.05         14.12          12.00
IF      475.70         2.66         14.12          11.90
IF      479.00         2.27         14.12          11.81
IF      482.30         1.87         14.12          11.72
IF      485.60         1.48         14.12          11.63
IF      488.80         1.08         14.12          11.56
IF      492.10         0.69         14.12          11.49
IF      495.40         0.30         14.12          11.43
IF      497.20         0.01         14.12          11.23
PART3 LOCATION OF AREAS ABOVE 100-YEAR SURGE
NO AREAS ABOVE 100-YEAR SURGE IN THIS TRANSECT
            PART4 LOCATION OF SURGE CHANGES
 STATION          10-YEAR SURGE          100-YEAR SURGE
   1.00               1.00                   8.99
   3.30               1.00                   8.99
   6.60               1.00                   8.99
   9.80               1.00                   8.99
  13.10               1.00                   9.00
  16.40               1.00                   9.00
  19.70               1.00                   9.00
  23.00               1.00                   9.00
  26.20               1.00                   9.01
  29.50               1.00                   9.01
  32.80               1.00                   9.01
  36.10               1.00                   9.01
  39.40               1.00                   9.02
  42.70               1.00                   9.02
  45.90               1.00                   9.02
  49.20               1.00                   9.02
  52.50               1.00                   9.03
  55.80               1.00                   9.03
```

59.10	1.00	9.03
62.30	1.00	9.03
65.60	1.00	9.04
68.90	1.00	9.04
72.20	1.00	9.04
75.50	1.00	9.05
78.70	1.00	9.05
82.00	1.00	9.05
85.30	1.00	9.05
88.60	1.00	9.06
91.90	1.00	9.06
95.10	1.00	9.06
98.40	1.00	9.06
101.70	1.00	9.06
105.00	1.00	9.07
108.30	1.00	9.07
111.50	1.00	9.07
114.80	1.00	9.07
118.10	1.00	9.08
121.40	1.00	9.08
124.70	1.00	9.08
128.00	1.00	9.08
131.20	1.00	9.09
134.50	1.00	9.09
137.80	1.00	9.09
141.10	1.00	9.09
144.40	1.00	9.09
147.60	1.00	9.10
150.90	1.00	9.10
154.20	1.00	9.10
157.50	1.00	9.10
160.80	1.00	9.10
164.00	1.00	9.11
167.30	1.00	9.11
170.60	1.00	9.11
173.90	1.00	9.11
177.20	1.00	9.11
180.40	1.00	9.12
183.70	1.00	9.12
187.00	1.00	9.12
190.30	1.00	9.12
193.60	1.00	9.12
196.80	1.00	9.13
200.10	1.00	9.13
203.40	1.00	9.13
206.70	1.00	9.13
210.00	1.00	9.13
213.30	1.00	9.14
216.50	1.00	9.14
219.80	1.00	9.14
223.10	1.00	9.14
226.40	1.00	9.14
229.70	1.00	9.14
232.90	1.00	9.14
236.20	1.00	9.15
239.50	1.00	9.15
242.80	1.00	9.15
246.10	1.00	9.15
249.30	1.00	9.15
252.60	1.00	9.15
255.90	1.00	9.15
259.20	1.00	9.15
262.50	1.00	9.16
265.70	1.00	9.16
269.00	1.00	9.16
272.30	1.00	9.16
275.60	1.00	9.16
278.90	1.00	9.16
282.20	1.00	9.16
285.40	1.00	9.17
288.70	1.00	9.17
292.00	1.00	9.17
295.30	1.00	9.17
298.60	1.00	9.17
301.80	1.00	9.17
305.10	1.00	9.18
308.40	1.00	9.18
311.70	1.00	9.18
315.00	1.00	9.18
318.20	1.00	9.18
321.50	1.00	9.18
324.80	1.00	9.18
328.10	1.00	9.18
331.40	1.00	9.18
334.60	1.00	9.19
337.90	1.00	9.19
341.20	1.00	9.19
344.50	1.00	9.19
351.00	1.00	9.19
354.30	1.00	9.19
357.60	1.00	9.19
360.90	1.00	9.19
364.20	1.00	9.19
367.50	1.00	9.20
370.70	1.00	9.20
374.00	1.00	9.20
377.30	1.00	9.20
380.60	1.00	9.20
383.90	1.00	9.20
387.10	1.00	9.20
390.40	1.00	9.20
393.70	1.00	9.21

397.00	1.00	9.21
400.30	1.00	9.21
403.50	1.00	9.21
406.80	1.00	9.21
410.10	1.00	9.21
413.40	1.00	9.21
416.70	1.00	9.21
423.20	1.00	9.21
426.50	1.00	9.20
429.80	1.00	9.20
433.10	1.00	9.20
436.40	1.00	9.19
439.60	1.00	9.19
442.90	1.00	9.19
446.20	1.00	9.18
449.50	1.00	9.18
452.80	1.00	9.03
456.00	1.00	9.14
459.30	1.00	9.27
462.60	1.00	9.41
465.90	1.00	9.55
469.20	1.00	9.70
472.40	1.00	9.86
475.70	1.00	10.04
479.00	1.00	10.23
482.30	1.00	10.41
485.60	1.00	10.60
488.80	1.00	10.80
492.10	1.00	11.01
495.40	1.00	11.22

PART5 LOCATION OF V ZONES

STATION OF GUTTER	LOCATION OF ZONE
472.84	WINDWARD

PART6 NUMBERED A ZONES AND V ZONES

STATION OF GUTTER	ELEVATION	ZONE DESIGNATION		FHF
0.00	19.55			
		V22	EL=20	120
1.00	19.55			
		V22	EL=20	120
2.00	19.54			
		V22	EL=20	120
3.30	19.54			
		V22	EL=20	120
6.60	19.53			
		V22	EL=20	120
9.80	19.52			
		V22	EL=20	120
13.10	19.51			
		V22	EL=20	120
16.40	19.51			
		V22	EL=20	120
19.70	19.51			
		V22	EL=20	120
23.00	19.51			
		V22	EL=20	120
26.20	19.50			
		V22	EL=20	120
29.50	19.50			
		V22	EL=20	120
32.80	19.50			
		V22	EL=20	120
35.16	19.50			
		V22	EL=19	120
36.10	19.50			
		V22	EL=19	120
39.40	19.50			
		V22	EL=19	120
42.70	19.50			
		V22	EL=19	120
45.90	19.50			
		V22	EL=19	120
49.20	19.50			
		V22	EL=19	120
52.50	19.49			
		V22	EL=19	120
55.80	19.49			
		V22	EL=19	120
59.10	19.49			
		V22	EL=19	120
62.30	19.49			
		V22	EL=19	120
65.60	19.49			
		V22	EL=19	120
68.90	19.49			
		V22	EL=19	120
72.20	19.49			
		V22	EL=19	120
75.50	19.48			
		V22	EL=19	120
78.70	19.48			
		V22	EL=19	120
82.00	19.48			
		V22	EL=19	120
85.30	19.48			
		V22	EL=19	120
88.60	19.48			
		V22	EL=19	120
91.90	19.48			
		V22	EL=19	120
95.10	19.48			
		V22	EL=19	120
98.40	19.48			

		V23	EL=19	130
101.70	19.47		
		V23	EL=19	130
105.00	19.47		
		V23	EL=19	130
108.30	19.47		
		V23	EL=19	130
111.50	19.47		
		V23	EL=19	130
114.80	19.47		
		V23	EL=19	130
118.10	19.46		
		V23	EL=19	130
121.40	19.46		
		V23	EL=19	130
124.70	19.46		
		V23	EL=19	130
128.00	19.46		
		V23	EL=19	130
131.20	19.46		
		V23	EL=19	130
134.50	19.46		
		V23	EL=19	130
137.80	19.45		
		V23	EL=19	130
141.10	19.45		
		V23	EL=19	130
144.40	19.45		
		V23	EL=19	130
147.60	19.45		
		V23	EL=19	130
150.90	19.45		
		V23	EL=19	130
154.20	19.44		
		V23	EL=19	130
157.50	19.44		
		V23	EL=19	130
160.80	19.44		
		V23	EL=19	130
164.00	19.44		
		V23	EL=19	130
167.30	19.44		
		V23	EL=19	130
170.60	19.43		
		V23	EL=19	130
173.90	19.43		
		V23	EL=19	130
177.20	19.43		
		V23	EL=19	130
180.40	19.43		
		V23	EL=19	130
183.70	19.43		
		V23	EL=19	130
187.00	19.42		
		V23	EL=19	130
190.30	19.42		
		V23	EL=19	130
193.60	19.42		
		V23	EL=19	130
196.80	19.42		
		V23	EL=19	130
200.10	19.41		
		V23	EL=19	130
203.40	19.41		
		V23	EL=19	130
206.70	19.41		
		V23	EL=19	130
210.00	19.41		
		V23	EL=19	130
213.30	19.40		
		V23	EL=19	130
216.50	19.40		
		V23	EL=19	130
219.80	19.40		
		V23	EL=19	130
223.10	19.39		
		V23	EL=19	130
226.40	19.38		
		V23	EL=19	130
229.70	19.36		
		V23	EL=19	130
232.90	19.35		
		V23	EL=19	130
236.20	19.34		
		V23	EL=19	130
239.50	19.33		
		V23	EL=19	130
242.80	19.32		
		V23	EL=19	130
246.10	19.31		
		V23	EL=19	130
249.30	19.29		
		V23	EL=19	130
252.60	19.28		
		V23	EL=19	130
255.90	19.27		
		V23	EL=19	130
259.20	19.26		
		V23	EL=19	130
262.50	19.24		
		V23	EL=19	130
265.70	19.23		

		V23	EL=19	130
269.00	19.22			
		V23	EL=19	130
272.30	19.21			
		V23	EL=19	130
275.60	19.20			
		V23	EL=19	130
278.90	19.18			
		V23	EL=19	130
282.20	19.17			
		V23	EL=19	130
285.40	19.16			
		V23	EL=19	130
288.70	19.15			
		V23	EL=19	130
292.00	19.14			
		V23	EL=19	130
295.30	19.12			
		V23	EL=19	130
298.60	19.11			
		V23	EL=19	130
301.80	19.10			
		V23	EL=19	130
305.10	19.09			
		V23	EL=19	130
308.40	19.07			
		V23	EL=19	130
311.70	19.06			
		V23	EL=19	130
315.00	19.05			
		V23	EL=19	130
318.20	19.03			
		V23	EL=19	130
321.50	19.01			
		V23	EL=19	130
324.80	19.00			
		V23	EL=19	130
328.10	18.98			
		V23	EL=19	130
331.40	18.97			
		V23	EL=19	130
334.60	18.95			
		V23	EL=19	130
337.90	18.93			
		V23	EL=19	130
341.20	18.92			
		V23	EL=19	130
344.50	18.90			
		V23	EL=19	130
347.80	18.89			
		V23	EL=19	130
351.00	18.87			
		V23	EL=19	130
354.30	18.86			
		V23	EL=19	130
357.60	18.84			
		V23	EL=19	130
360.90	18.82			
		V23	EL=19	130
364.20	18.81			
		V23	EL=19	130
367.50	18.79			
		V23	EL=19	130
370.70	18.78			
		V23	EL=19	130
374.00	18.76			
		V23	EL=19	130
377.30	18.75			
		V23	EL=19	130
380.60	18.73			
		V23	EL=19	130
383.90	18.71			
		V23	EL=19	130
387.10	18.70			
		V23	EL=19	130
390.40	18.68			
		V23	EL=19	130
393.70	18.67			
		V23	EL=19	130
397.00	18.65			
		V23	EL=19	130
400.30	18.63			
		V23	EL=19	130
403.50	18.62			
		V23	EL=19	130
406.80	18.60			
		V23	EL=19	130
410.10	18.59			
		V23	EL=19	130
413.40	18.57			
		V23	EL=19	130
416.70	18.56			
		V23	EL=19	130
419.90	18.50			
		V23	EL=18	130
419.90	18.50			
		V23	EL=18	130
423.20	18.15			
		V23	EL=18	130
426.50	17.79			
		V23	EL=18	130
429.24	17.50			

		V23	EL=17	130
429.80	17.44			
		V23	EL=17	130
433.10	17.08			
		V23	EL=17	130
436.40	16.73			
		V23	EL=17	130
438.45	16.50			
		V23	EL=16	130
439.60	16.37			
		V23	EL=16	130
442.90	16.02			
		V23	EL=16	130
446.20	15.66			
		V23	EL=16	130
447.66	15.50			
		V23	EL=15	130
449.50	15.30			
		V23	EL=15	130
450.46	14.50			
		V23	EL=14	130
451.67	13.50			
		V23	EL=13	130
452.80	12.56			
		V23	EL=13	130
454.48	12.50			
		V23	EL=12	130
456.00	12.45			
		V23	EL=12	130
459.30	12.36			
		V23	EL=12	130
462.60	12.27			
		V23	EL=12	130
465.90	12.18			
		V23	EL=12	130
469.20	12.10			
		V24	EL=12	140
472.40	12.00			
		V24	EL=12	140
472.84	12.05			
		A21	EL=12	110
475.70	11.90			
		A21	EL=12	110
479.00	11.81			
		A21	EL=12	110
482.30	11.72			
		A21	EL=12	110
485.60	11.63			
		A21	EL=12	110
488.80	11.56			
		A21	EL=12	110
491.79	11.50			
		A21	EL=11	110
492.10	11.49			
		A21	EL=11	110
495.40	11.43			
		A21	EL=11	110
497.20	11.23			

ZONE TERMINATED AT END OF TRANSECT
PART 7   POSTSCRIPT NOTES
PS# 1   START(404019.8044,4833822.5918)
PS# 2   END(403962.9959,4834037.0921)

-1.000000e+00

CM-54
100-year WHAFIS Output
Zero Station: -70.19065254, 43.65239954
Onshore Dir: 104.8 deg CCW from E

Legend:
- Ground
- V-zone
- SWEL + Setup
- Wave Crest Envelope
- BFE

X-axis: Station (ft)
Y-axis: Elevation (ft-NAVD88)

Iterative TAW for CM-54

Two Percent Run-up Elevation is 24.9 Feet NAVD88

Run-up Height is 15.1 Feet

Elevation (Feet-NAVD88)

Distance from zero NAVD88 shoreline (feet)

Ground
TAW Segments
SWEL
Final 2% Run-up
R2 iterations
Toe|SWEL-1.5*H0
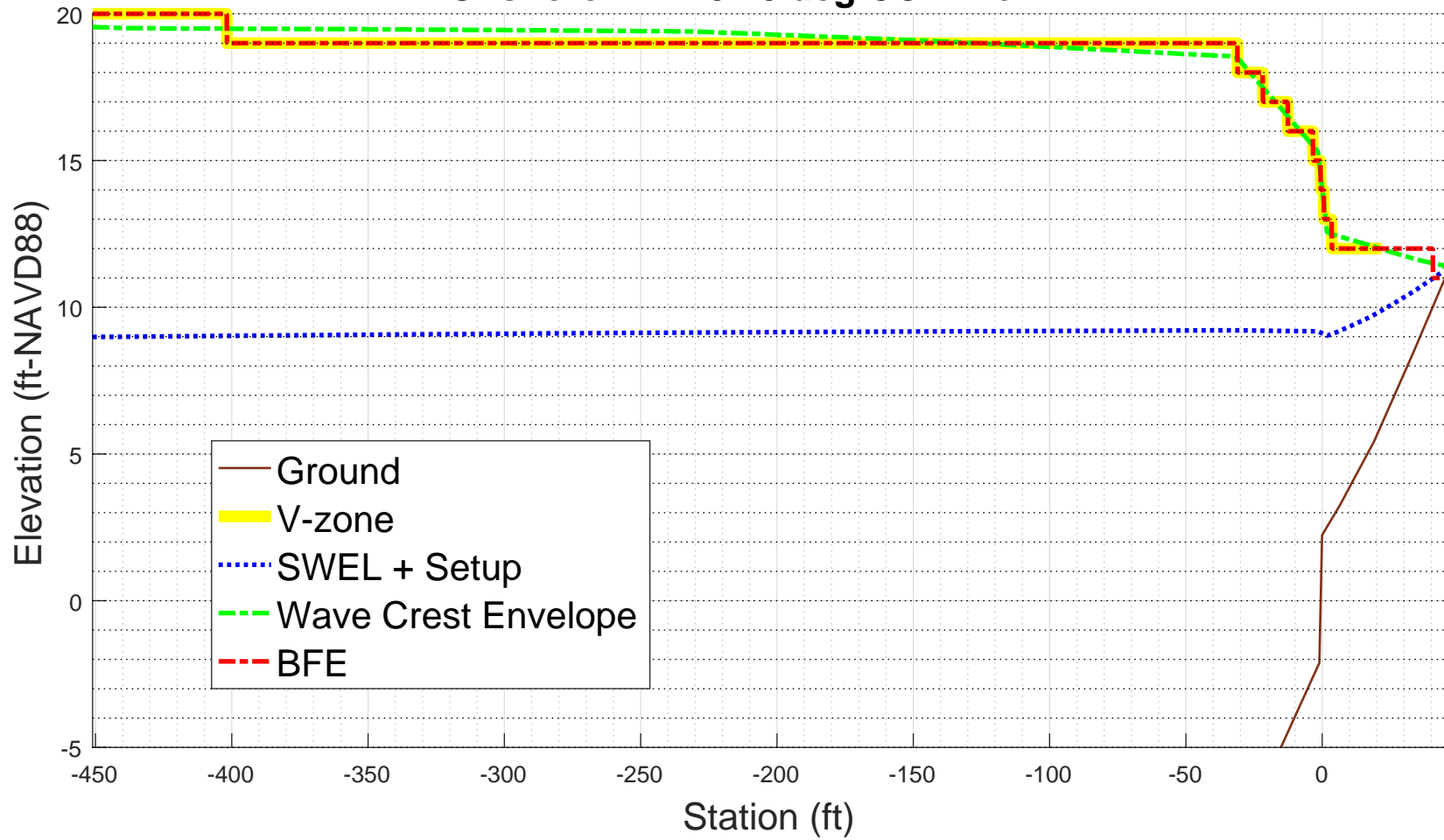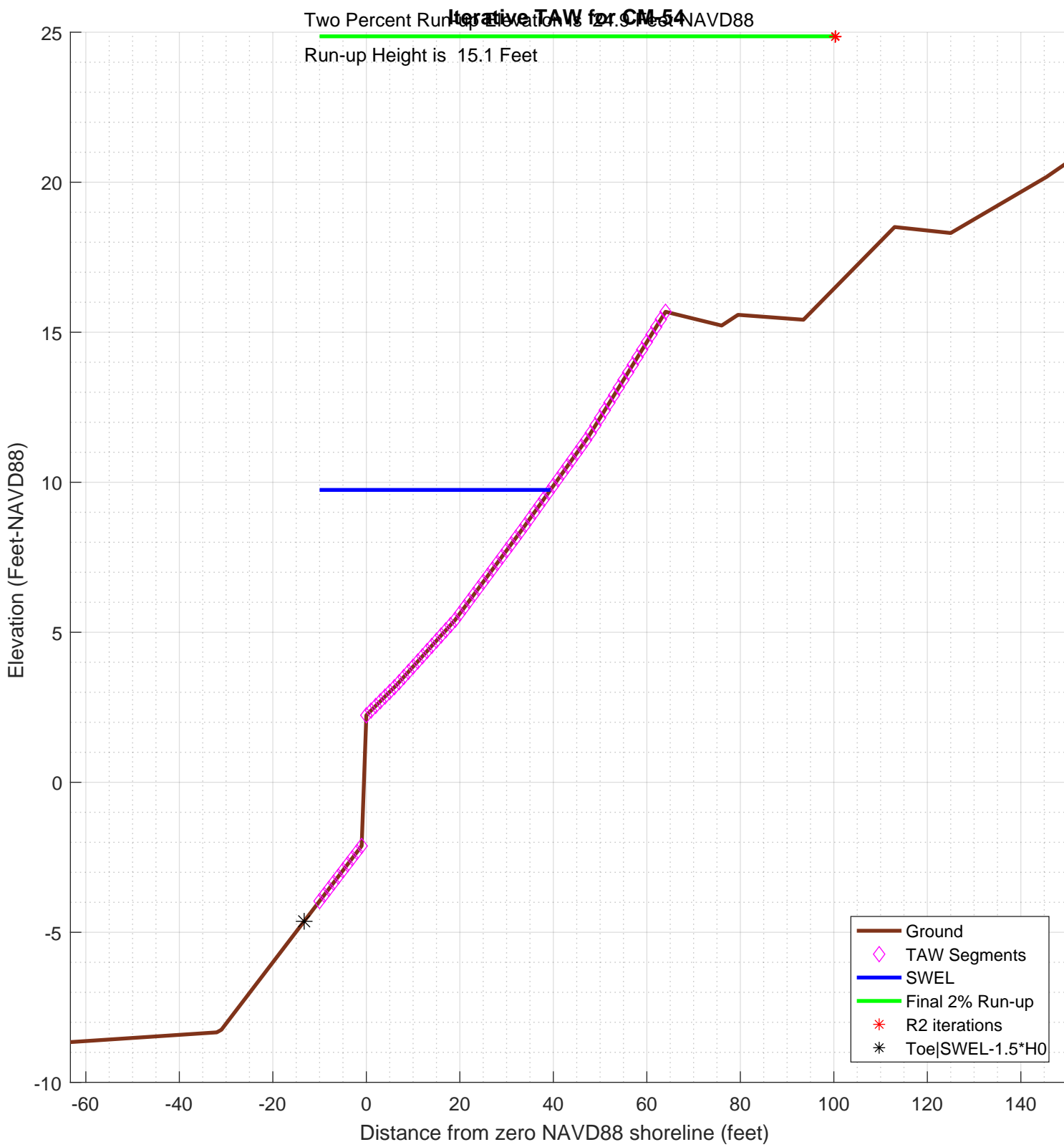
```
diary on          % begin recording

% FEMA appeal for The Town of Harpswell, Cumberland county, Maine
% TRANSECT ID: CM-54
% calculation by SJH, Ransom Consulting, Inc. 16-Apr-2020
% 100-year wave runup using TAW methodology
% including berm and weighted average with foreshore if necessary
%
% chk nld 20200220
%
% This script assumes that the incident wave conditions provided
% as input in the configuration section below are the
% appropriate values located at the end of the foreshore
% or toe of the slope on which the run-up is being calculated
% the script does not attempt to apply a depth limit or any other
% transformation to the incident wave conditions other than
% conversion of the peak wave period to the spectral mean wave
% as recommended in the references below
%
% references:
%
% Van der Meer, J.W., 2002. Technical Report Wave Run-up and
% Wave Overtopping at Dikes. TAW Technical Advisory Committee on
% Flood Defence, The Netherlands.
%
% FEMA. 2007,  Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update
%
%
%


%-------------------------------------------------------------------------
% CONFIG
%-------------------------------------------------------------------------
fname='inpfiles/CM-54sta_ele_include.csv';   % file with station, elevation, include
                                  % third colunm is 0 for excluded points
imgname='logfiles/CM-54-runup';
SWEL=8.9874;  % 100-yr still water level including wave setup.
H0=9.2313;    % significant wave height at toe of structure
Tp=13.882;    % peak period, 1/fma,
T0=Tp/1.1;

gamma_berm=1;   % this may get changed automatically below
gamma_rough=0.5;
gamma_beta=1;
gamma_perm=1;

setupAtToe=0.22642;
maxSetup=2.2367;   % only used in case of berm/shallow foreshore weighted average

plotTitle='Iterative TAW for CM-54'

plotTitle =

Iterative TAW for CM-54


% END CONFIG
%------------------------------

SWEL=SWEL+setupAtToe

SWEL =

                9.21382

SWEL_fore=SWEL+maxSetup

SWEL_fore =

                11.45052


% FIND WAVELENGTH USING DEEPWATER DISPERSION RELATION
% using English units
L0=32.15/(2*pi)*T0^2

L0 =

           814.92908607186


% Find Hb (Munk, 1949)
%Hb=H0/(3.3*(H0/L0)^(1/3))
%Db=-Hb/.78+SWEL;  % depth at breaking

% The toe elevation here is only used to determine the average
% structure slope, it is not used to depth limit the wave height.
% Any depth limiting or other modification of the wave height
```

```
% to make it consitent with TAW guidance should be performed
% prior to the input of the significant wave height given above.
Ztoe=SWEL-1.5*H0

Ztoe =

                  -4.63313


% read the transect
[sta,dep,inc] = textread(fname,'%n%n%n%*[^\n]','delimiter',',','headerlines',0);

% remove unselected points
k=find(inc==0);
sta(k)=[];
dep(k)=[];

sta_org=sta;   % used for plotting purposes
dep_org=dep;


% initial guess at maximum run-up elevation to estimate slope
Z2=SWEL+1.5*H0

Z2 =

                  23.06077


% determine station at the max runup and -1.5*H0 (i.e. the toe)
top_sta=-999;
toe_sta=-999;
for kk=1:length(sta)-1
    if ((Z2 > dep(kk)) & (Z2 <= dep(kk+1)))     % here is the intersection of z2 with profile
        top_sta=interp1(dep(kk:kk+1),sta(kk:kk+1),Z2)
    end
    if  ((Ztoe > dep(kk)) & (Ztoe <= dep(kk+1)))     % here is the intersection of Ztoe with profile
        toe_sta=interp1(dep(kk:kk+1),sta(kk:kk+1),Ztoe)
    end
end

toe_sta =

         -13.3009958538761

% check to make sure we got them, if not extend the end slopes outward
S=diff(dep)./diff(sta);
if toe_sta==-999
   dy=dep(1)-Ztoe;
   toe_sta=sta(1)-dy/S(1)
end
if top_sta==-999
   dy=Z2-dep(end);
   top_sta=sta(end)+dy/S(end)
end

top_sta =

          93.218315018315


% just so the reader can tell the values aren't -999 anymore
top_sta

top_sta =

          93.218315018315

toe_sta

toe_sta =

         -13.3009958538761




% check for case where the toe of slope is below SWL-1.5*H0
% in this case interpolate setup from the setupAtToe(really setup as first station), and the max setup
% also un-include points seaward of SWL-1.5*H0
if Ztoe > dep(1)
   dd=SWEL_fore-dep;
   k=find(dd<0,1); % k is index of first land point
   staAtSWL=interp1(dep(k-1:k),sta(k-1:k),SWEL_fore);
   dsta=staAtSWL-sta(1);
   dsetup=maxSetup-setupAtToe;
   dsetdsta=dsetup/dsta;
   setup=setupAtToe+dsetdsta*(toe_sta-sta(1));
   sprintf('-!!- Location of SWEL-1.5*H0 is %4.1f ft landward of toe of slope',dsta)
   sprintf('-!!- Setup is interpolated between setup at toe of slope and max setup')
```

```
    sprintf('-!!-         setup is adjusted to %4.2f feet',setup)
    SWEL=SWEL-setupAtToe+setup;
    sprintf('-!!-         SWEL is adjusted to %4.2f feet',SWEL)
    k=find(dep < SWEL-1.5*H0)
    sta(k)=[];
    dep(k)=[];
else
    sprintf('-!!- The User has selected a starting point that is %4.2f feet above the elevation of SWEL-1.5H0\n',dep(1
    sprintf('-!!- This may be reasonable for some cases.  However the user may want to consider:\n')
    sprintf('-!!-   1) Selecting a starting point that is at or below %4.2f feet elevation, or\n', Ztoe)
    sprintf('-!!-   2) Reducing the incident wave height to a depth limited condition.\n')
end

ans =

-!!- Location of SWEL-1.5*H0 is 82.2 ft landward of toe of slope


ans =

-!!- Setup is interpolated between setup at toe of slope and max setup


ans =

-!!-         setup is adjusted to 0.76 feet


ans =

-!!-         SWEL is adjusted to 9.74 feet


k =

     1
     2
     3
     4
     5
     6
     7
     8
     9
    10
    11
    12
    13
    14
    15
    16
    17
    18
    19
    20
    21
    22
    23
    24
    25



% now iterate converge on a runup elevation
tol=0.01;  % convergence criteria
R2del=999;
R2_new=3*H0; %initial guess
R2=R2_new;
iter=0;
R2_all=[];
topStaAll=[];
Berm_Segs=[];
TAW_ALWAYS_VALID=1;
while(abs(R2del) > tol && iter <= 25)
    iter=iter+1;
    sprintf ('!---------------- STARTING ITERATION %d ----------------!',iter)
    % elevation of toe of slope
    Ztoe
    % station of toe slope (relative to 0-NAVD88 shoreline
    toe_sta
    % station of top of slope/extent of 2% run-up
    top_sta
    % elevation of top of slope/extent of 2% run-up
    Z2
    % incident significant wave height
    H0
    % incident spectral peak wave period
    Tp
    % incident spectral mean wave period
```

```
T0

R2=R2_new
Z2=R2+SWEL
% determine slope for this iteration
top_sta=-999;
for kk=1:length(sta)-1
    if ((Z2 > dep(kk)) & (Z2 <= dep(kk+1)))     % here is the intersection of z2 with profile
        top_sta=interp1(dep(kk:kk+1),sta(kk:kk+1),Z2)
        break;
    end
end
if top_sta==-999
    dy=Z2-dep(end);
    top_sta=sta(end)+dy/S(end)
end

% get the length of the slope (not accounting for berm)
Lslope=top_sta-toe_sta

% loop over profile segments to determine berm factor
% re-calculate influence of depth of berm based on this run-up elevation
% check for berm, berm width, berm height
berm_width=0;
rdh_sum=0;
Berm_Segs=[];
Berm_Heights=[];
for kk=1:length(sta)-1
    ddep=dep(kk+1)-dep(kk);
    dsta=sta(kk+1)-sta(kk);
    s=ddep/dsta;
    if  (s < 1/15)     % count it as a berm if slope is flatter than 1:15 (see TAW manual)
        sprintf ('Berm Factor Calculation: Iteration %d, Profile Segment: %d',iter,kk)
        berm_width=berm_width+dsta;    % tally the width of all berm segments
        % compute the rdh for this segment and weight it by the segment length
        dh=SWEL-(dep(kk)+dep(kk+1))/2
        if  dh < 0
            chi=R2;
        else
            chi=2* H0;
        end
        if (dh <= R2 & dh >=-2*H0)
            rdh=(0.5-0.5*cos(3.14159*dh/chi)) ;
        else
            rdh=1;
        end
        rdh_sum=rdh_sum + rdh * dsta
        Berm_Segs=[Berm_Segs, kk];
        Berm_Heights=[Berm_Heights, (dep(kk)+dep(kk+1))/2];
    end
    if dep(kk) >= Z2  % jump out of loop if we reached limit of run-up for this iteration
        break
    end
end
sprintf ('!------- End Berm Factor Calculation, Iter: %d ---------!',iter)
berm_width
rB=berm_width/Lslope
if (berm_width > 0)
    rdh_mean=rdh_sum/berm_width
else
    rdh_mean=1
end
gamma_berm=1- rB * (1-rdh_mean)
if gamma_berm > 1
    gamma_berm=1
end
if gamma_berm < 0.6
    gamma_berm =0.6
end
% Iribarren number
slope=(Z2-Ztoe)/(Lslope-berm_width)
Irb=(slope/(sqrt(H0/L0)))
% runup height
gamma_berm
gamma_perm
gamma_beta
gamma_rough
gamma=gamma_berm*gamma_perm*gamma_beta*gamma_rough

% check validity
TAW_VALID=1;
if (Irb*gamma_berm < 0.5 | Irb*gamma_berm > 10 )
    sprintf('!!! - - Iribaren number: %6.2f is outside the valid range (0.5-10), TAW NOT VALID - - !!!\n', Irb*gam
    TAW_VALID=0;
else
    sprintf('!!! - - Iribaren number: %6.2f is in the valid range (0.5-10), TAW RECOMMENDED - - !!!\n', Irb*gamma_
end
islope=1/slope;
if (slope < 1/8 | slope > 1)
    sprintf('!!! - - slope: 1:%3.1f V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!\n', islope)
```

```
        TAW_VALID=0;
    else
        sprintf('!!! - - slope: 1:%3.1f V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!\n', islope)
    end
    if TAW_VALID == 0
        TAW_ALWAYS_VALID=0;
    end

    if (Irb*gamma_berm < 1.8)
        R2_new=gamma*H0*1.77*Irb
    else
        R2_new=gamma*H0*(4.3-(1.6/sqrt(Irb)))
    end


    % check to see if we need to evaluate a shallow foreshore
    if berm_width > 0.25 * L0;
        disp ('!   Berm_width is greater than 1/4 wave length')
        disp ('!   Runup will be weighted average with foreshore calculation assuming depth limited wave height on ber
        % do the foreshore calculation
        fore_H0=0.78*(SWEL_fore-min(Berm_Heights))
        % get upper slope
        fore_toe_sta=-999;
        fore_toe_dep=-999;
        for kk=length(dep)-1:-1:1
            ddep=dep(kk+1)-dep(kk);
            dsta=sta(kk+1)-sta(kk);
            s=ddep/dsta;
            if s < 1/15
                break
            end
            fore_toe_sta=sta(kk);
            fore_toe_dep=dep(kk);
            upper_slope=(Z2-fore_toe_dep)/(top_sta-fore_toe_sta)
        end
        fore_Irb=upper_slope/(sqrt(fore_H0/L0));
        fore_gamma=gamma_perm*gamma_beta*gamma_rough;
        if (fore_Irb < 1.8)
            fore_R2=fore_gamma*fore_H0*1.77*fore_Irb;
        else
            fore_R2=fore_gamma*fore_H0*(4.3-(1.6/sqrt(fore_Irb)));
        end
        if berm_width >= L0
            R2_new=fore_R2
            disp ('berm is wider than one wavelength, use full shallow foreshore solution');
        else
            w2=(berm_width-0.25*L0)/(0.75*L0)
            w1=1-w2
            R2_new=w2*fore_R2 + w1*R2_new
        end
    end % end berm width check
    % convergence criterion
    R2del=abs(R2-R2_new)
    R2_all(iter)=R2_new;
    % get the new top station (for plot purposes)
    Z2=R2_new+SWEL
    top_sta=-999;
    for kk=1:length(sta)-1
        if ((Z2 > dep(kk)) & (Z2 <= dep(kk+1)))     % here is the intersection of z2 with profile
            top_sta=interp1(dep(kk:kk+1),sta(kk:kk+1),Z2)
            break;
        end
    end
    if top_sta==-999
        dy=Z2-dep(end);
        top_sta=sta(end)+dy/S(end);
    end
    topStaAll(iter)=top_sta;
end
ans =
!---------------- STARTING ITERATION 1 ----------------!
Ztoe =
                    -4.63313
toe_sta =
        -13.3009958538761
top_sta =
        93.218315018315
Z2 =
                    23.06077
H0 =
                    9.2313
Tp =
                    13.882
T0 =
                    12.62
R2 =
                    27.6939
Z2 =
        37.4384807090869
top_sta =
```

```
              150.15410636209
Lslope =
          163.455102215966
ans =
!------- End Berm Factor Calculation, Iter: 1 ---------!
berm_width =
     0
rB =
     0
rdh_mean =
     1
gamma_berm =
     1
slope =
         0.257389400139369
Irb =
          2.41834988586755
gamma_berm =
     1
gamma_perm =
     1
gamma_beta =
     1
gamma_rough =
                        0.5
gamma =
                        0.5
ans =
!!! - - Iribaren number:   2.42 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:3.9 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
          15.0983921556538
R2del =
          12.5955078443462
Z2 =
          24.8429728647407
ans =
!---------------- STARTING ITERATION 2 ----------------!
Ztoe =
                   -4.63313
toe_sta =
         -13.3009958538761
top_sta =
          100.275845420219
Z2 =
          24.8429728647407
H0 =
                     9.2313
Tp =
                     13.882
T0 =
                      12.62
R2 =
          15.0983921556538
Z2 =
          24.8429728647407
top_sta =
          100.275845420219
Lslope =
          113.576841274095
ans =
!------- End Berm Factor Calculation, Iter: 2 ---------!
berm_width =
     0
rB =
     0
rdh_mean =
     1
gamma_berm =
     1
slope =
         0.259525643908393
Irb =
          2.43842136073095
gamma_berm =
     1
gamma_perm =
     1
gamma_beta =
     1
gamma_rough =
                        0.5
gamma =
                        0.5
ans =
!!! - - Iribaren number:   2.44 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:3.9 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
```

```
          15.1179774588164
R2del =
       0.0195853031625539
Z2 =
          24.8625581679033
ans =
!---------------- STARTING ITERATION 3 ----------------!
Ztoe =
                  -4.63313
toe_sta =
        -13.3009958538761
top_sta =
          100.3534032983
Z2 =
          24.8625581679033
H0 =
                    9.2313
Tp =
                   13.882
T0 =
                    12.62
R2 =
          15.1179774588164
Z2 =
          24.8625581679033
top_sta =
          100.3534032983
Lslope =
          113.654399152176
ans =
!------- End Berm Factor Calculation, Iter: 3 ---------!
berm_width =
     0
rB =
     0
rdh_mean =
     1
gamma_berm =
     1
slope =
       0.259520866661838
Irb =
         2.43837647522419
gamma_berm =
     1
gamma_perm =
     1
gamma_beta =
     1
gamma_rough =
                       0.5
gamma =
                       0.5
ans =
!!! - - Iribaren number:   2.44 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:3.9 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
          15.1179339305016
R2del =
      4.35283147872667e-05
Z2 =
          24.8625146395885
% final 2% runup elevation
Z2=R2_new+SWEL
Z2 =
          24.8625146395885
diary off
-1.000000e+00
```

```
_____
PART 5: RUNUP2

        for transect: CM-54

Station locations shifted by: -0.51 feet from their
original location to set the shoreline to
elevation 0 for RUNUP2 input


_____RUNUP2 INPUT CONVERSIONS_____
        for transect: CM-54

Incident significant wave height: 11.67 feet

Peak wave period: 14.12 seconds

Mean wave height: 7.30 feet

Local Depth below SWEL: 19.94 feet

Mean wave height deshoaled using Hunt approximation for
celerity assuming constant wave energy flux.
 References: R.G. Dean and R.A. Dalrymple. 2000.  Water

            Wave Mechanics for Engineers and Scientists. World
            Scientific Publishing Company, River Edge New Jersy

            USACE (1985), Direct Methods for Calculating Wavelength, CETN-1-17
            US Army Engineer Waterways Experiment Station Coastel Engineering
            Research Center, Vicksburg, MS

            also see Coastal Engineering Manual Part II-3
            for discussion of shoaling coefficient

    Depth, D = 19.94
    Period, T = 12.01
    Waveheight, H = 7.30
Deep water wavelength, L0 (ft)
    L0 = g*T*T/twopi
    L0 = 32.17*12.01*12.01/6.28 = 738.04
Deep water wave celerity, C0 (ft/s)
    C0 = L0/T
    C0 = 738.04/12.01 = 61.48
Angular frequency, sigma (rad/s)
    sigma = twopi/T
    sigma = 6.28/12.01 = 0.52
Hunts (1979) approximation for Celerity C1H (ft/s) at Depth D (ft)
    y = sigma.*sigma.*D./g
    y = 0.52*0.52*19.94/32.17 = 0.17
    C1H = sqrt( g.*D./(y+1./(1 + 0.6522.*y + 0.4622.*y.^2 + 0.0864.*y.^4 +0.0675.*y.^5)) )
    C1H = 24.61
Shoaling Coefficient KsH
    KsH = sqrt(C0/C1H)
    KsH = sqrt(61.48/24.61) = 1.58
Deepwater Wave Height H0_H (ft)
    H0_H = H/KsH
    H0_H = 7.30/1.58 = 4.62

Deepwater mean wave height: 4.62 feet

_____END RUNUP2 CONVERSIONS_____

_____RUNUP2 RESULTS_____
        for transect: CM-54

RUNUP2 SWEL:
9.00
9.00
9.00
9.00
```

```
9.00
9.00
9.00
9.00
9.00

RUNUP2 deepwater mean wave heights:
4.39
4.39
4.39
4.62
4.62
4.62
4.85
4.85
4.85

RUNUP2 mean wave periods:
11.41
12.01
12.61
11.41
12.01
12.61
11.41
12.01
12.61

RUNUP2 runup above SWEL:
6.78
7.05
7.31
7.09
7.37
7.65
7.42
7.69
6.84

RUNUP2 Mean runup height above SWEL: 7.24 feet

RUNUP2 2-percent runup height above SWEL: 15.94 feet

RUNUP2 2-percent runup elevation: 24.94 feet-NAVD88

RUNUP2 Messages:
Nonfatal Error, Check Output

_____END RUNUP2 RESULTS_____



_____ACES BEACH RUNUP_____

Incident significant wave height: 11.67 feet

Significant wave height is mean wave height divided by 0.626
Reference: D.2.8.1.2.1 Atlanic and Gulf of Mexico G&S Feb. 2007

Deepwater significant wave height: 7.38 feet

Peak wave period: 14.12 seconds

Average beach Slope: 1:19.15 (H:V)


ACES IRREGULAR WAVE RUNUP ON BEACHES

# Reference:
# Leenknecht, David A., Andre Szuwaiski, and Ann Sherlock. 1992.
# "Automated Coastal Engineering System Technical Reference",
# Coastal Engineering Research Center, Department of the Army
```

```
# Waterways Experiments Station, Corps of Eniggneers, 3909 Halls
# Ferry Road, Vicksburg, Mississippi 39180-6199.

INPUTS:

Acceleration Due to Gravity,          g  =   32.174
Deepwater Significant Wave height,  Hs =    7.38
Wave Period,                          T  =   14.12
Beach Slope,                          S  =    0.052

EQUATIONS:

Runup,              R   = Hs * a * Irb^b
Iribarren,         Irb = S/sqrt(Hs/L0)
Wavelength,        L0  = g * T^2 / 2 / pi

COEFFICIENTS:
(Mase, H. 1989, "Random Wave Runup Height on Gentle Slopes,"
j. Waterway, Port, Coastal and Ocean Engineering Division,
ASCE, Vol 115, No. 5, pp 649-661.)

               [Rmax,  R2%, R-1/3, R-1/10, R-mean]
         a = [2.32, 1.86,  1.70,   1.38,   0.88]
         b = [0.77, 0.71,  0.71,   0.70,   0.69]

RESULTS:

      RUNUP = [11.8,  9.7,   8.9,    7.2,    4.6]

ACES RUNUP CALCULATED USING 'Aces_Beach_Runup.m'

ACES Beach 2-percent runup height above SWEL: 9.72 feet

ACES Beach 2-percent runup elevation: 18.72 feet-NAVD88

ACES BEACH RUNUP is valid

_____END ACES BEACH RESULTS_____

PART 5 COMPLETE_____
```

```
   FEMA                                          sjh              job 2
   RUNUP2 transect: CM-54                                          1
7.00
   -10.95 -450.5 0.5
   -10.85 -435.5 0.5
   -10.84 -434.5 0.5
   -10.22 -230.5 0.5
   -10.21 -229.5 0.5
   -9.46 -140.5 0.5
   -9.45 -139.5 0.5
   -8.33 -31.5  0.5
   -8.25 -30.5  0.5
   -5.39 -16.5  0.5
   -2.73 -3.5   0.5
   -2.12 -0.5   0.5
   2.23  0.5    0.5
   3.25  7.0    0.5
   5.41  19.5   0.5
   8.46  34.0   0.5
   11.52 48.0   0.5
   15.68 64.5   0.5
   15.68 94.0   0.5
1 18.51 113.5  0.5
   9.0    4.39  11.41
   9.0    4.39  12.01
   9.0    4.39  12.61
   9.0    4.62  11.41
   9.0    4.62  12.01
   9.0    4.62  12.61
   9.0    4.85  11.41
   9.0    4.85  12.01
   9.0    4.85  12.61
```

****

                    CROSS SECTION PROFILE

            LENGTH   ELEV.   SLOPE   ROUGHNESS

        1   -450.0   -10.9
                                .00   .50
        2   -435.0   -10.8
                               FLAT   .50
        3   -434.0   -10.8
                             340.00   .50
        4   -230.0   -10.2
                               FLAT   .50
        5   -229.0   -10.2
                             119.59   .50
        6   -140.5   -9.4
                             100.00   .50
        7   -139.5   -9.4
                              96.43   .50
        8   -31.5   -8.3
                              12.50   .50
        9   -30.5   -8.2
                               4.90   .50
       10   -16.5   -5.4
                               4.89   .50
       11   -3.5   -2.7
                               4.92   .50
       12   -.5   -2.1
                                .23   .50
       13   .5   2.2
                               6.37   .50
       14   7.0   3.3
                               5.79   .50
       15   19.5   5.4
                               4.75   .50
       16   34.0   8.5
                               4.58   .50
       17   48.0   11.5
                               3.97   .50
       18   64.5   15.7
                               FLAT   .50
       19   94.0   15.7
                               6.89   .50
       20   113.5   18.5

                    LAST SLOPE   7.00   LAST ROUGHNESS   .50

****

OUTPUT TABLE

INPUT PARAMETERS				RUNUP RESULTS		
WATER LEVEL ABOVE DATUM (FT.)	DEEP WATER WAVE HEIGHT (FT.)	WAVE PERIOD (SEC.)	BREAKING SLOPE NUMBER	RUNUP SLOPE NUMBER	RUNUP ABOVE WATER LEVEL (FT.)	BREAKER DEPTH (FT.)
9.00	4.39	11.41	11	19	6.78 5.82	6.83
					SOLUTION DOES NOT CONVERGE	
9.00	4.39	12.01	11	19	7.05 6.08	6.98
					SOLUTION DOES NOT CONVERGE	
9.00	4.39	12.61	11	19	7.31 6.34	7.13
					SOLUTION DOES NOT CONVERGE	
9.00	4.62	11.41	11	19	7.09 6.03	7.12
					SOLUTION DOES NOT CONVERGE	
9.00	4.62	12.01	11	19	7.37 6.31	7.27
					SOLUTION DOES NOT CONVERGE	
9.00	4.62	12.61	11	19	7.65 6.56	7.42
					SOLUTION DOES NOT CONVERGE	
9.00	4.85	11.41	11	19	7.42 6.21	7.40
					SOLUTION DOES NOT CONVERGE	
9.00	4.85	12.01	11	19	7.69 6.50	7.55
					SOLUTION DOES NOT CONVERGE	
9.00	4.85	12.61	11	19	6.84	7.71

Runup2 2% runup elevation for Transect: CM-54

Two Percent Run-up Elevation is 24.9 Feet-NAVD88

Run-up Height is 15.9 Feet

Legend:
- Ground
- Swel
- 2% Runup

X-axis: Station (ft)
Y-axis: Elevation (ft)