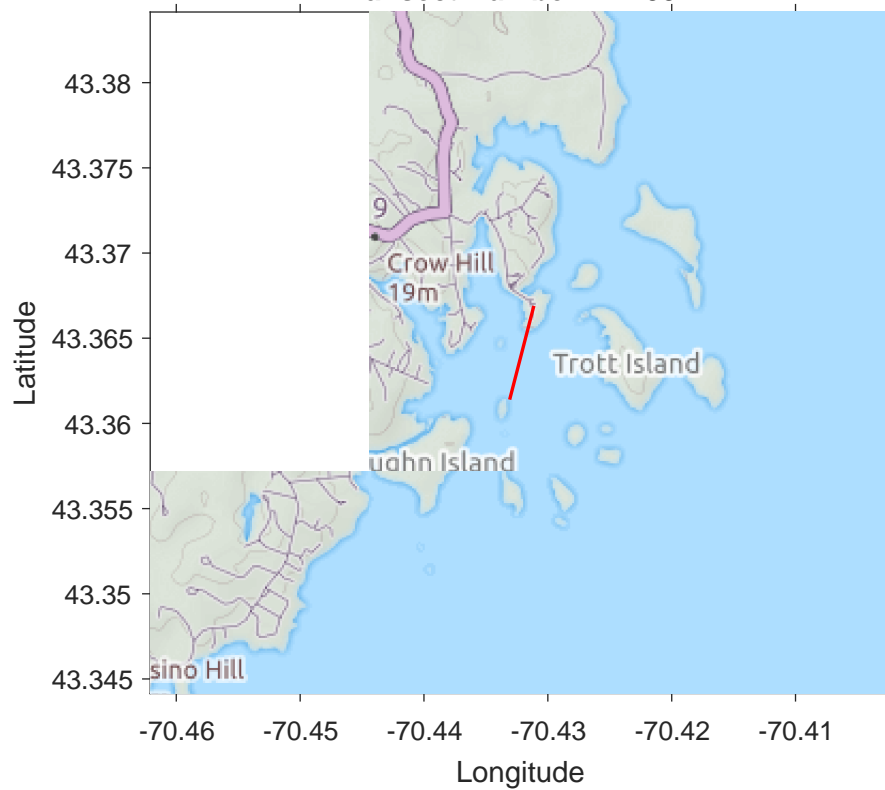
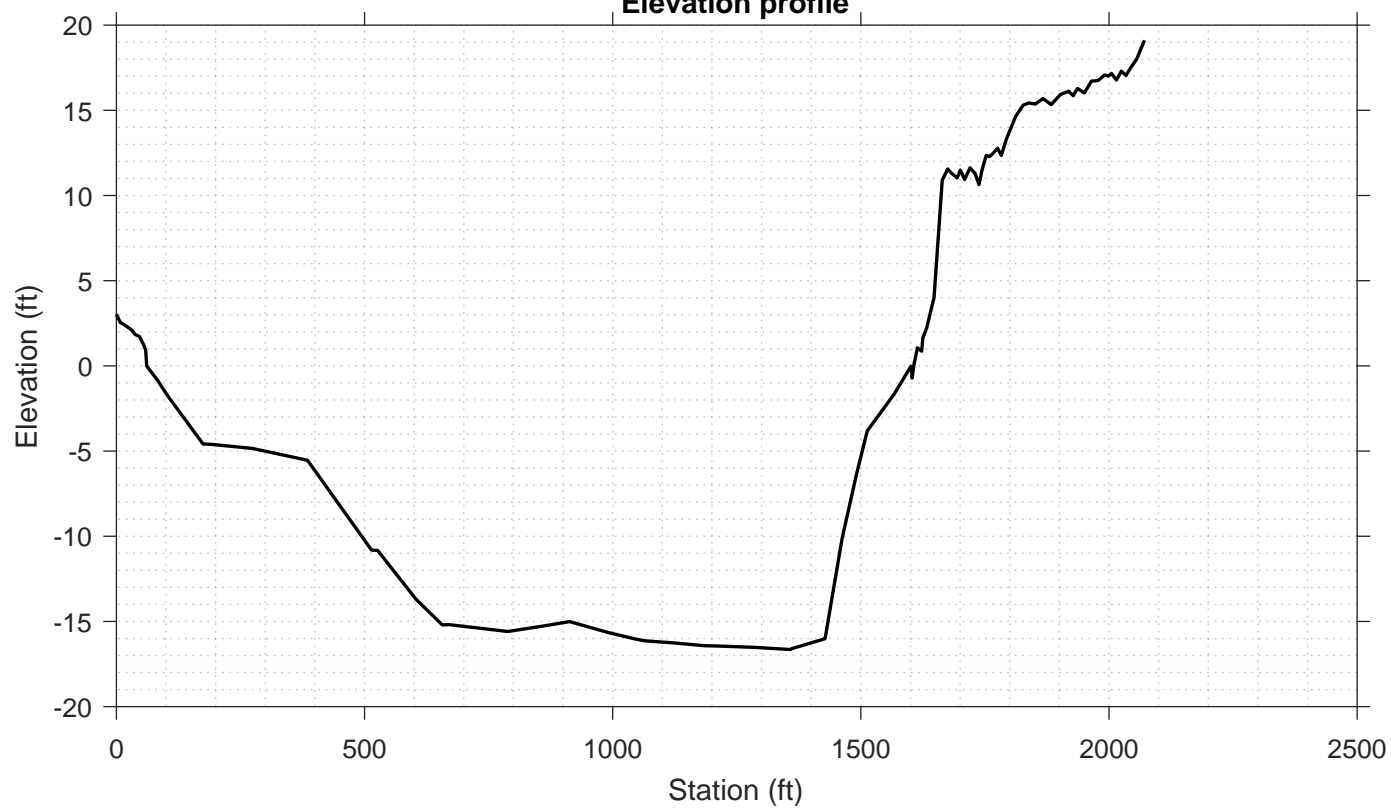


Transect Number: YK-99-2



Elevation profile



DATA LOG FOR TRANSECT ID: YK-99-2

PART 1: USER INPUT

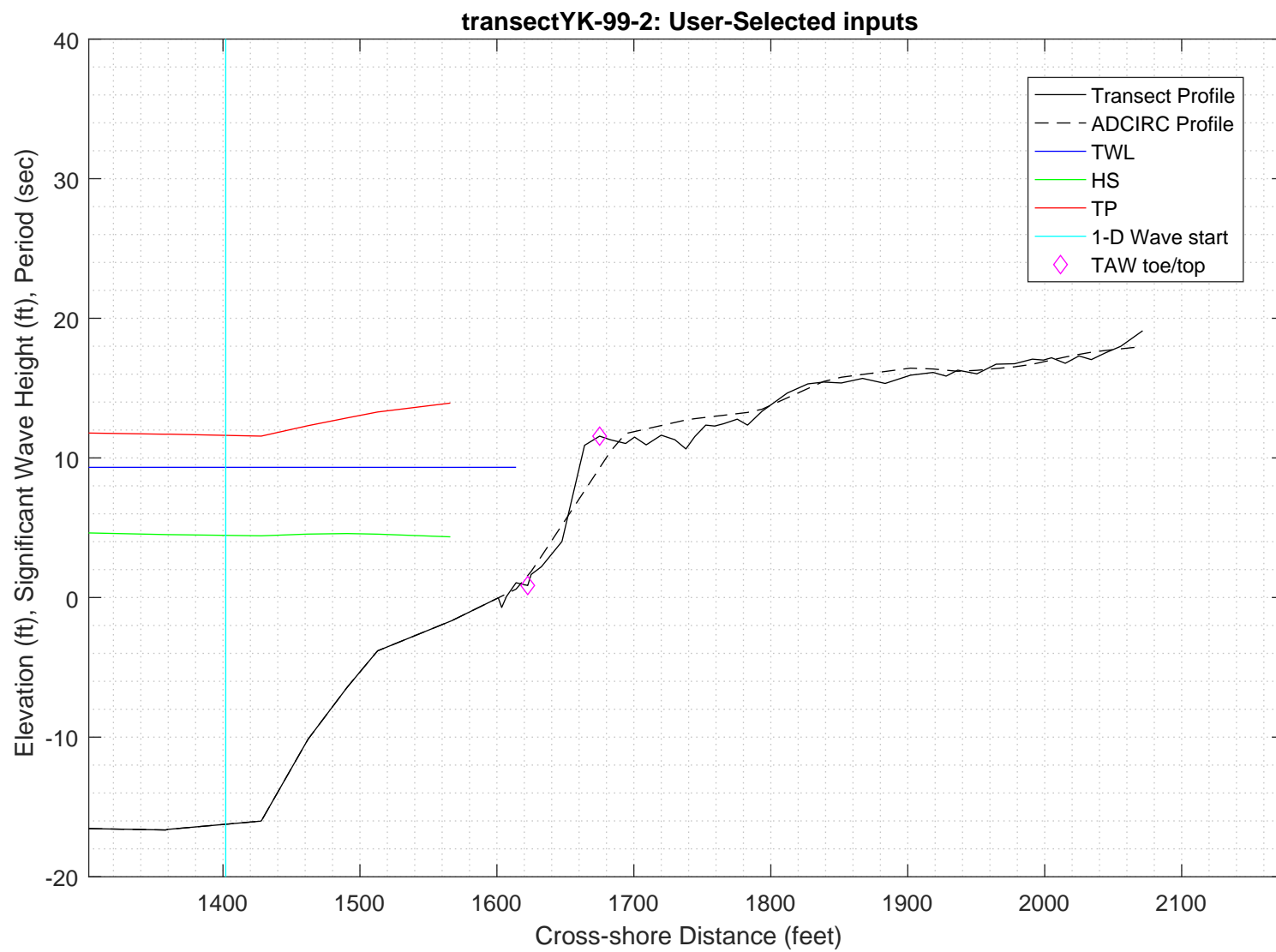
SWAN 1-D / WHAFIS input

station: 1402 ft
LON: -70.4318 deg E
LAT: 43.3651 deg N
Bottom ELEV: -16.2385 ft-NAVD88
TWL: 9.3261 ft-NAVD88
HS: 4.4534 ft
TP: 11.615 sec
Wave Direction bin: 90 deg CCW from East (90 deg sector)
Transect Direction: 70.417 deg CCW from East

TAW/RUNUP input

toe sta: 1622.5 ft
toe elev: 0.86286 ft-NAVD88
top sta: 1675 ft
top elev: 11.5584 ft-NAVD88
Wave and water level conditions at toe to be calculated in SWAN 1-D

PART 1 COMPLETE



PART 2: SWAN 1-D

swan input grid name: 2_swan/gridfiles/YK-99-2zmeters_xmeters.grd
swan file name: 2_swan/swanfiles/YK-99-2.swn
swan output name: 2_swan/swanfiles/YK-99-2.dat

Boundary Conditions:
TWL- 2.8426 meters
HS- 1.3574 meters
PER- 11.615 seconds

Batch File: 2_swan/swanfiles/runswan.dat

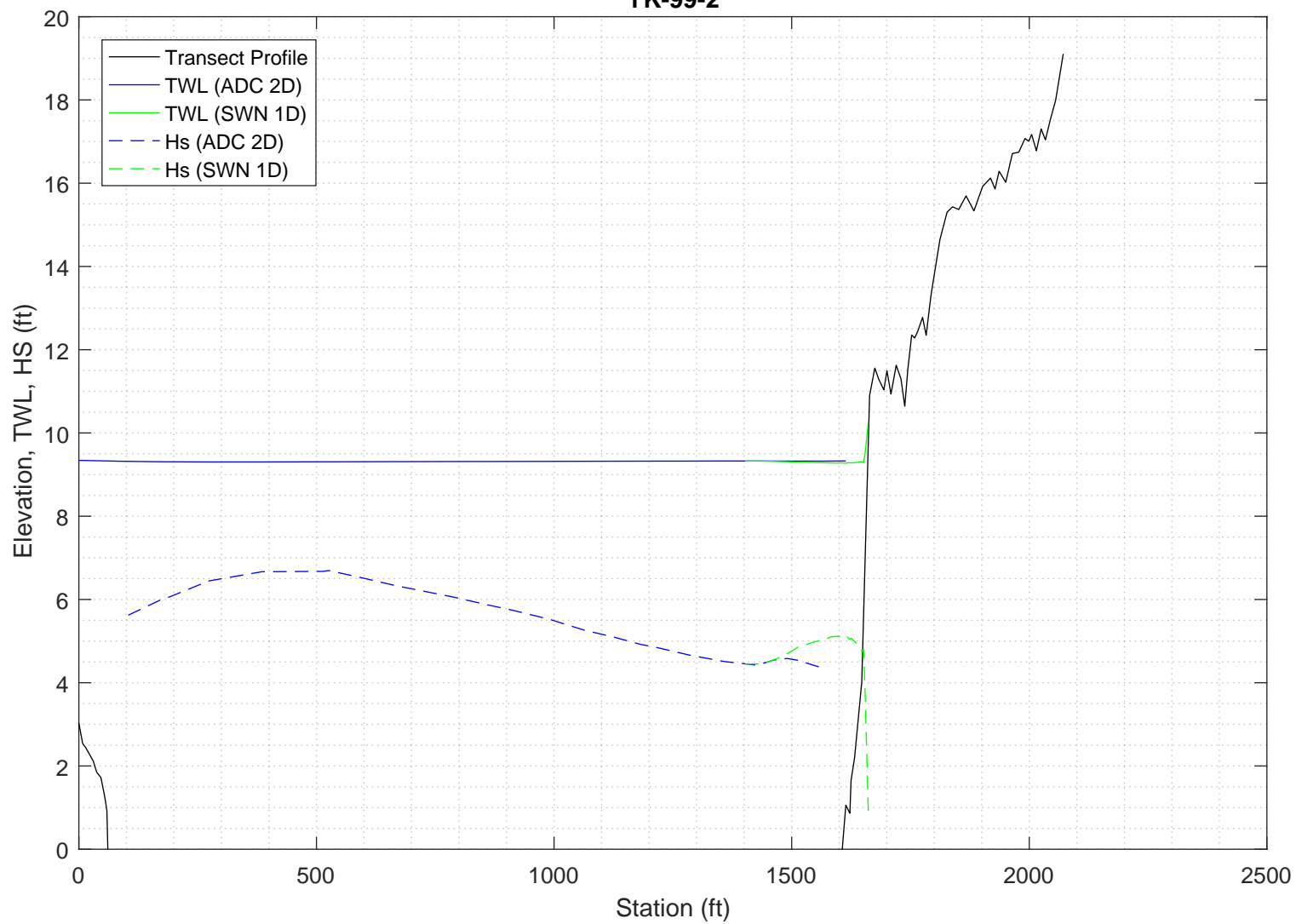
SWAN maximum additional wave setup: 0.93903 feet
SWAN output at toe:
SETUP- -0.039442 feet
HS- 5.0379 feet
PER- 11.3516 seconds

PART 2 COMPLETE

SWAN maximum additional wave setup: 0.93903 feet
SWAN output at toe:
SETUP- -0.039442 feet
HS- 5.0379 feet
PER- 11.3516 seconds

PART 2 COMPLETE

2-D ADCIRC+SWAN and SWAN 1-D results, Transect:
YK-99-2



Execution started at 20200401.174317

```

-----
                        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 79 0. 79 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 79 0 1 1

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

READ BOTTOM -1. '../gridfiles/YK-99-2zmeters_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 1.3574 11.615 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] [edmlpm] [cdrag] [umin] [cfpm]
!-- GEN2 [cf10] [cf20] [cf30] [cf40] [cf50] [cf60] [edmlpm] [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' [xpl] [yp1] <[int] [xp] [yp] >
      CURVE 'curve' 0      0      79 79      0
!TABLE 'sname' < HEADER|NOHEAdER|INDEXed > 'fname' <output parameters> (output time)
      Table 'curve' HEADER 'YK-99-2.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          80 MYC          1
                   : MCGRD         81
                   : 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 EDMLEPM   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 63.75 % 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  1.25 % 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 56.25 % 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 82.50 % 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 96.25 % 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 98.75 % 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 100.00 % of wet grid points ( 99.50 % required)
```

STOP

Run: 1

Table:curve

SWAN version:41.20A

Xp [m]	Yp [m]	Hsig [m]	TPsmoo [sec]	RTpeak [sec]	Tm_l0 [sec]	Dir [degr]	Dspr [degr]	Depth [m]	Setup [m]
0.	0.	1.35537	11.3150	11.1572	10.4792	0.000	31.5057	7.7900	0.000000
1.	0.	1.35565	11.3151	11.1572	10.4722	0.000	31.4682	7.7800	-0.000009
2.	0.	1.35603	11.3153	11.1572	10.4653	0.000	31.4438	7.7700	-0.000019
3.	0.	1.35616	11.3154	11.1572	10.4581	0.000	31.4239	7.7700	-0.000018
4.	0.	1.35649	11.3156	11.1572	10.4513	0.000	31.3925	7.7600	-0.000028
5.	0.	1.35678	11.3157	11.1572	10.4444	0.000	31.3573	7.7500	-0.000037
6.	0.	1.35707	11.3159	11.1572	10.4376	0.000	31.3209	7.7400	-0.000046
7.	0.	1.35726	11.3160	11.1572	10.4308	0.000	31.2716	7.7299	-0.000056
8.	0.	1.35614	11.3162	11.1572	10.4238	0.000	31.0211	7.7099	-0.000070
9.	0.	1.35796	11.3167	11.1572	10.4215	0.000	30.6170	7.5298	-0.000239
10.	0.	1.35938	11.3173	11.1572	10.4181	0.000	30.1618	7.3596	-0.000408
11.	0.	1.36109	11.3179	11.1572	10.4137	0.000	29.6885	7.1894	-0.000593
12.	0.	1.36320	11.3186	11.1572	10.4085	0.000	29.2105	7.0192	-0.000793
13.	0.	1.36577	11.3193	11.1572	10.4021	0.000	28.7330	6.8490	-0.001011
14.	0.	1.36880	11.3201	11.1572	10.3945	0.000	28.2666	6.6788	-0.001246
15.	0.	1.37221	11.3209	11.1572	10.3853	360.000	27.8505	6.5085	-0.001492
16.	0.	1.37636	11.3218	11.1572	10.3747	360.000	27.4303	6.3282	-0.001772
17.	0.	1.38058	11.3227	11.1572	10.3618	360.000	27.0112	6.1579	-0.002058
18.	0.	1.38538	11.3237	11.1572	10.3467	360.000	26.6141	5.9876	-0.002368
19.	0.	1.38957	11.3247	11.1572	10.3285	360.000	26.2544	5.8474	-0.002641
20.	0.	1.39377	11.3257	11.1572	10.3081	360.000	25.9135	5.7171	-0.002912
21.	0.	1.39829	11.3267	11.1572	10.2859	360.000	25.5766	5.5868	-0.003200
22.	0.	1.40313	11.3279	11.1572	10.2614	360.000	25.2389	5.4565	-0.003506
23.	0.	1.40827	11.3291	11.1572	10.2348	360.000	24.8992	5.3262	-0.003834
24.	0.	1.41371	11.3303	11.1572	10.2061	360.000	24.5603	5.1958	-0.004182
25.	0.	1.41946	11.3317	11.1572	10.1751	360.000	24.2475	5.0655	-0.004547
26.	0.	1.42551	11.3331	11.1572	10.1419	360.000	23.9367	4.9351	-0.004937
27.	0.	1.43193	11.3346	11.1572	10.1063	360.000	23.6310	4.8046	-0.005354
28.	0.	1.43817	11.3362	11.1572	10.0680	0.000	23.3329	4.6842	-0.005765
29.	0.	1.44471	11.3378	11.1572	10.0275	0.000	23.0363	4.5638	-0.006205
30.	0.	1.45156	11.3395	11.1572	9.9849	0.000	22.7368	4.4433	-0.006675
31.	0.	1.45876	11.3413	11.1572	9.9402	0.000	22.4411	4.3228	-0.007180
32.	0.	1.46563	11.3431	11.1572	9.8931	0.000	22.1432	4.2123	-0.007675
33.	0.	1.47351	11.3450	11.1572	9.8446	0.000	21.8496	4.0917	-0.008252
34.	0.	1.48069	11.3469	11.1572	9.7933	0.000	21.6255	3.9912	-0.008766
35.	0.	1.48415	11.3486	11.1572	9.7387	0.000	21.4786	3.9510	-0.008980
36.	0.	1.48772	11.3502	11.1572	9.6856	0.000	21.3568	3.9108	-0.009199
37.	0.	1.49130	11.3518	11.1572	9.6341	0.000	21.2431	3.8706	-0.009421
38.	0.	1.49487	11.3533	11.1572	9.5840	0.000	21.1312	3.8304	-0.009647
39.	0.	1.49852	11.3547	11.1572	9.5338	0.000	21.0196	3.7901	-0.009877
40.	0.	1.50219	11.3560	11.1572	9.4843	0.000	20.9076	3.7499	-0.010111
41.	0.	1.50581	11.3572	11.1572	9.4360	0.000	20.7951	3.7097	-0.010348
42.	0.	1.50939	11.3583	11.1572	9.3890	0.000	20.6818	3.6694	-0.010589
43.	0.	1.51292	11.3593	11.1572	9.3433	0.000	20.5679	3.6292	-0.010832
44.	0.	1.51639	11.3602	11.1572	9.2986	0.001	20.4538	3.5889	-0.011076
45.	0.	1.51979	11.3611	11.1572	9.2553	0.001	20.3416	3.5487	-0.011322
46.	0.	1.52310	11.3618	11.1572	9.2131	0.001	20.2321	3.5084	-0.011567
47.	0.	1.52631	11.3624	11.1572	9.1722	0.001	20.1236	3.4682	-0.011811
48.	0.	1.52941	11.3629	11.1572	9.1324	0.001	20.0152	3.4279	-0.012053
49.	0.	1.53239	11.3632	11.1572	9.0936	0.002	19.9068	3.3877	-0.012293
50.	0.	1.53518	11.3635	11.1572	9.0560	0.003	19.7889	3.3475	-0.012530
51.	0.	1.53866	11.3637	11.1572	9.0200	0.004	19.6675	3.2972	-0.012843
52.	0.	1.54135	11.3638	11.1572	8.9820	0.008	19.5427	3.2569	-0.013079
53.	0.	1.54586	11.3637	11.1572	8.9297	0.013	19.4135	3.2066	-0.013395
54.	0.	1.55019	11.3635	11.1572	8.8749	0.015	19.2823	3.1563	-0.013690
55.	0.	1.55390	11.3632	11.1572	8.8222	0.014	19.1540	3.1061	-0.013950
56.	0.	1.55633	11.3627	11.1572	8.7767	360.000	19.0406	3.0559	-0.014141
57.	0.	1.55701	11.3620	11.1572	8.7340	359.974	18.9271	3.0158	-0.014190
58.	0.	1.55843	11.3612	11.1572	8.6909	359.953	18.8011	2.9657	-0.014326
59.	0.	1.55948	11.3602	11.1572	8.6472	359.936	18.6706	2.9156	-0.014433

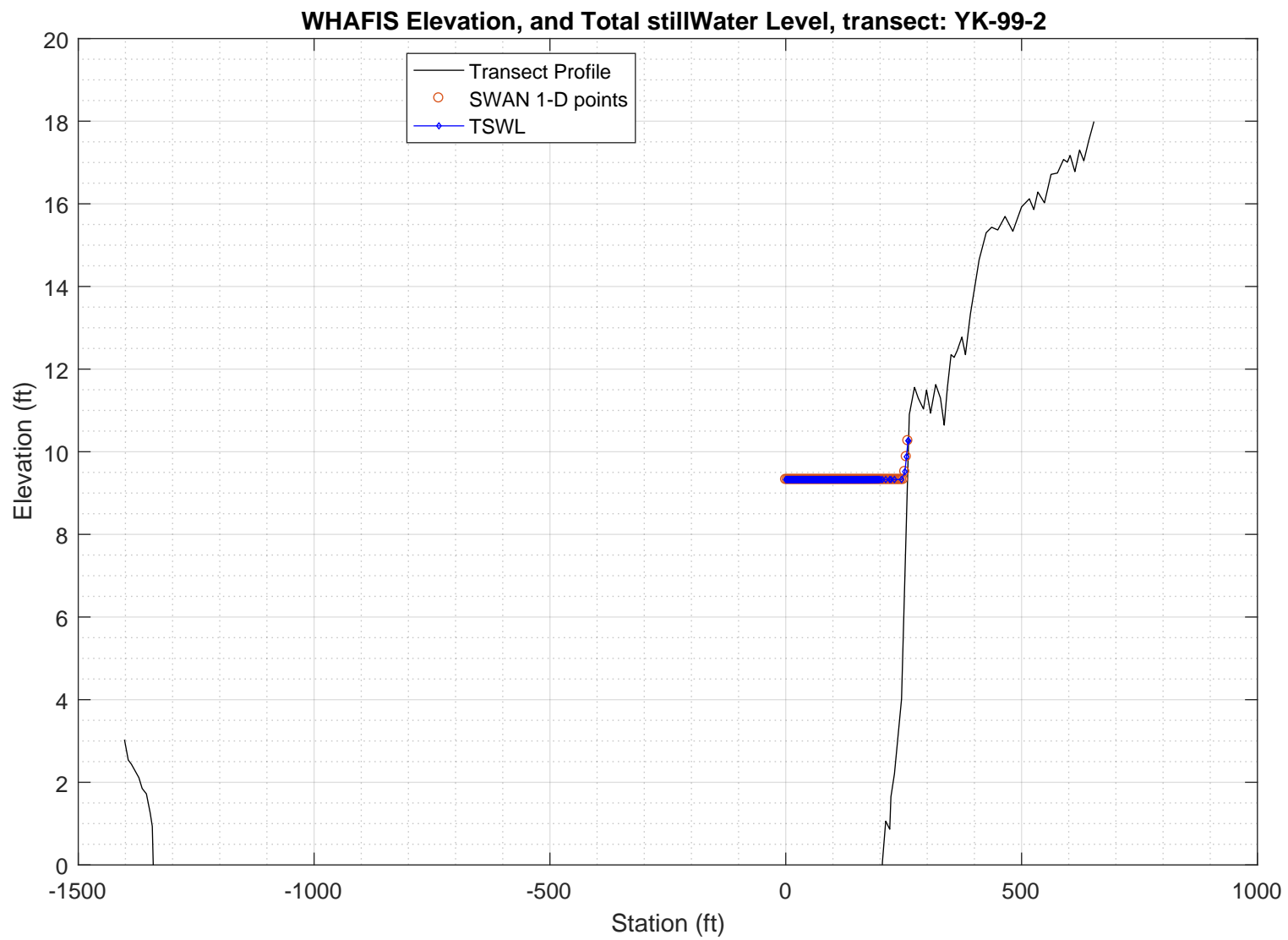
60.	0.	1.56056	11.3590	11.1572	8.6036	359.921	18.6418	2.8655	-0.014507
61.	0.	1.55176	11.3575	11.1572	8.5476	359.911	18.7065	2.9266	-0.013397
62.	0.	1.55033	11.3562	11.1572	8.4912	359.902	18.5314	2.9168	-0.013163
63.	0.	1.56301	11.3553	11.1572	8.4482	359.892	18.1791	2.7353	-0.014662
64.	0.	1.56675	11.3544	11.1572	8.4191	359.875	17.8784	2.5946	-0.015418
65.	0.	1.56231	11.3534	11.1572	8.3834	359.882	17.7266	2.5148	-0.015153
66.	0.	1.54906	11.3524	11.1572	8.3213	359.851	17.7414	2.5365	-0.013519
67.	0.	1.53555	11.3516	11.1572	8.2630	359.813	17.5379	2.5580	-0.012022
68.	0.	1.54493	11.3516	11.1572	8.2468	359.760	17.1404	2.3262	-0.013846
69.	0.	1.53562	11.3515	11.1572	8.1972	359.710	16.8414	2.2469	-0.013092
70.	0.	1.52283	11.3515	11.1572	8.1451	359.665	16.5370	2.1781	-0.011906
71.	0.	1.51386	11.3518	11.1572	8.0839	359.669	16.1613	2.0687	-0.011275
72.	0.	1.50308	11.3523	11.1572	8.0093	359.690	15.7548	1.9496	-0.010375
73.	0.	1.48715	11.3528	11.1572	7.9361	359.738	15.3518	1.8312	-0.008846
74.	0.	1.46665	11.3531	11.1572	7.8560	359.798	14.8743	1.7133	-0.006679
75.	0.	1.44557	11.3531	11.1572	7.7797	359.891	13.9831	1.5451	-0.004922
76.	0.	1.46268	11.3540	11.1572	7.7159	359.899	12.5744	1.1177	-0.012297
77.	0.	1.13944	11.5233	11.1572	8.3917	358.519	12.0986	0.7685	0.058507
78.	0.	0.71026	11.9158	12.4477	9.5087	357.307	13.0305	0.4683	0.168266
79.	0.	0.28161	15.5924	15.4936	11.3246	357.999	16.4542	0.1662	0.286218

PART 3: WHAFIS

WHAFIS input: YK-99-2.dat

WHAFIS output: YK-99-2.out

PART 3 COMPLETE



WAVE HEIGHT COMPUTATIONS FOR FLOOD INSURANCE STUDIES (WHAFIS VERSION 4.0G, 08_2007)

Executed on: Thu Apr 2 11:05:19 2020

Input file: C:\FEMA-TransectAnalysis\LOMR-TransectAnalysis-Kennebunkport\3_whafis\whafis4\YK-99-2.dat

Output file: C:\FEMA-TransectAnalysis\LOMR-TransectAnalysis-Kennebunkport\3_whafis\whafis4\YK-99-2.out

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	-16.238	1.000	1.000	9.326	7.125	11.615	56.140	0.009	0.000
OF	1.000	-16.229	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	2.000	-16.221	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	3.000	-16.212	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	4.000	-16.203	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	5.000	-16.195	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	6.000	-16.186	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	7.000	-16.177	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	8.000	-16.169	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	9.000	-16.160	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	10.000	-16.151	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	11.000	-16.142	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	12.000	-16.134	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	13.000	-16.125	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	14.000	-16.116	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	15.000	-16.108	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	16.000	-16.099	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	17.000	-16.090	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	18.000	-16.082	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	19.000	-16.073	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	20.000	-16.064	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	21.000	-16.055	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	22.000	-16.047	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	23.000	-16.038	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	24.000	-16.029	0.000	9.326	0.000	0.000	0.000	0.000	0.009	0.000
OF	25.000	-16.021	0.000	9.326	0.000	0.000	0.000	0.000	0.015	0.000
OF	26.000	-15.998	0.000	9.326	0.000	0.000	0.000	0.000	0.097	0.000
OF	27.000	-15.826	0.000	9.326	0.000	0.000	0.000	0.000	0.171	0.000
OF	28.000	-15.655	0.000	9.326	0.000	0.000	0.000	0.000	0.171	0.000
OF	29.000	-15.483	0.000	9.326	0.000	0.000	0.000	0.000	0.171	0.000
OF	30.000	-15.312	0.000	9.326	0.000	0.000	0.000	0.000	0.171	0.000
OF	31.000	-15.140	0.000	9.326	0.000	0.000	0.000	0.000	0.172	0.000
OF	32.000	-14.968	0.000	9.326	0.000	0.000	0.000	0.000	0.171	0.000
OF	33.000	-14.797	0.000	9.326	0.000	0.000	0.000	0.000	0.171	0.000
OF	34.000	-14.625	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	35.000	-14.454	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	36.000	-14.283	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	37.000	-14.111	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	38.000	-13.940	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	39.000	-13.768	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	40.000	-13.597	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	41.000	-13.425	0.000	9.325	0.000	0.000	0.000	0.000	0.172	0.000
OF	42.000	-13.253	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	43.000	-13.082	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	44.000	-12.910	0.000	9.325	0.000	0.000	0.000	0.000	0.172	0.000
OF	45.000	-12.738	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	46.000	-12.567	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	47.000	-12.395	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	48.000	-12.224	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	49.000	-12.053	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	50.000	-11.881	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	51.000	-11.710	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	52.000	-11.538	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	53.000	-11.367	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	54.000	-11.195	0.000	9.325	0.000	0.000	0.000	0.000	0.172	0.000
OF	55.000	-11.023	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	56.000	-10.852	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	57.000	-10.680	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	58.000	-10.509	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	59.000	-10.337	0.000	9.325	0.000	0.000	0.000	0.000	0.171	0.000
OF	60.000	-10.166	0.000	9.325	0.000	0.000	0.000	0.000	0.152	0.000
OF	61.000	-10.033	0.000	9.325	0.000	0.000	0.000	0.000	0.131	0.000
OF	62.000	-9.903	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	63.000	-9.773	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	64.000	-9.643	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	65.000	-9.512	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	66.000	-9.382	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	67.000	-9.252	0.000	9.325	0.000	0.000	0.000	0.000	0.131	0.000
OF	68.000	-9.121	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	69.000	-8.991	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	70.000	-8.861	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	71.000	-8.731	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	72.000	-8.600	0.000	9.325	0.000	0.000	0.000	0.000	0.131	0.000
OF	73.000	-8.470	0.000	9.325	0.000	0.000	0.000	0.000	0.130	0.000
OF	74.000	-8.340	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	75.000	-8.209	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	76.000	-8.079	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	77.000	-7.949	0.000	9.324	0.000	0.000	0.000	0.000	0.131	0.000
OF	78.000	-7.818	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	79.000	-7.688	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	80.000	-7.558	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	81.000	-7.427	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	82.000	-7.297	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	83.000	-7.167	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	84.000	-7.037	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	85.000	-6.906	0.000	9.324	0.000	0.000	0.000	0.000	0.131	0.000
OF	86.000	-6.776	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	87.000	-6.646	0.000	9.324	0.000	0.000	0.000	0.000	0.130	0.000
OF	88.000	-6.515	0.000	9.324	0.000	0.000	0.000	0.000	0.128	0.000
OF	89.000	-6.390	0.000	9.324	0.000	0.000	0.000	0.000	0.122	0.000
OF	90.000	-6.272	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	91.000	-6.155	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000
OF	92.000	-6.037	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000

OF	93.000	-5.919	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	94.000	-5.802	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	95.000	-5.684	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	96.000	-5.567	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000
OF	97.000	-5.449	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	98.000	-5.332	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	99.000	-5.214	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000
OF	100.000	-5.097	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000
OF	101.000	-4.979	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	102.000	-4.861	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	103.000	-4.744	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	104.000	-4.626	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000
OF	105.000	-4.509	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	106.000	-4.391	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	107.000	-4.274	0.000	9.324	0.000	0.000	0.000	0.000	0.117	0.000
OF	108.000	-4.156	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	109.000	-4.038	0.000	9.324	0.000	0.000	0.000	0.000	0.118	0.000
OF	110.000	-3.921	0.000	9.324	0.000	0.000	0.000	0.000	0.112	0.000
OF	111.000	-3.814	0.000	9.324	0.000	0.000	0.000	0.000	0.073	0.000
OF	112.000	-3.774	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	113.000	-3.734	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	114.000	-3.694	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	115.000	-3.654	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	116.000	-3.614	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	117.000	-3.574	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	118.000	-3.535	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	119.000	-3.495	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	120.000	-3.455	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	121.000	-3.415	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	122.000	-3.375	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	123.000	-3.335	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	124.000	-3.295	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	125.000	-3.255	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	126.000	-3.215	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	127.000	-3.175	0.000	9.324	0.000	0.000	0.000	0.000	0.040	0.000
OF	128.000	-3.136	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	129.000	-3.096	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	130.000	-3.056	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	131.000	-3.016	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	132.000	-2.976	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	133.000	-2.936	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	134.000	-2.896	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	135.000	-2.856	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	136.000	-2.816	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	137.000	-2.777	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	138.000	-2.737	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	139.000	-2.697	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	140.000	-2.657	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	141.000	-2.617	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	142.000	-2.577	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	143.000	-2.537	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	144.000	-2.497	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	145.000	-2.457	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	146.000	-2.418	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	147.000	-2.378	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	148.000	-2.338	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	149.000	-2.298	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	150.000	-2.258	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	151.000	-2.218	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	152.000	-2.178	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	153.000	-2.138	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	154.000	-2.099	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	155.000	-2.059	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	156.000	-2.019	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	157.000	-1.979	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	158.000	-1.939	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	159.000	-1.899	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	160.000	-1.859	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	161.000	-1.819	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	162.000	-1.779	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	163.000	-1.740	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	164.000	-1.700	0.000	9.323	0.000	0.000	0.000	0.000	0.040	0.000
OF	165.000	-1.660	0.000	9.323	0.000	0.000	0.000	0.000	0.044	0.000
OF	166.000	-1.611	0.000	9.323	0.000	0.000	0.000	0.000	0.048	0.000
OF	167.000	-1.563	0.000	9.323	0.000	0.000	0.000	0.000	0.048	0.000
OF	168.000	-1.515	0.000	9.323	0.000	0.000	0.000	0.000	0.048	0.000
OF	169.000	-1.467	0.000	9.323	0.000	0.000	0.000	0.000	0.048	0.000
OF	170.000	-1.419	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	171.000	-1.371	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	172.000	-1.323	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	173.000	-1.275	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	174.000	-1.226	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	175.000	-1.178	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	176.000	-1.130	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	177.000	-1.082	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	178.000	-1.034	0.000	9.324	0.000	0.000	0.000	0.000	0.048	0.000
OF	179.000	-0.986	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	180.000	-0.938	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	181.000	-0.889	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	182.000	-0.841	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	183.000	-0.793	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	184.000	-0.745	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	185.000	-0.697	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	186.000	-0.649	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	187.000	-0.601	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	188.000	-0.552	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	189.000	-0.504	0.000	9.325	0.000	0.000	0.000	0.000	0.048	0.000
OF	190.000	-0.456	0.000	9.326	0.000	0.000	0.000	0.000	0.048	0.000
OF	191.000	-0.408	0.000	9.326	0.000	0.000	0.000	0.000	0.048	0.000
OF	192.000	-0.360	0.000	9.326	0.000	0.000	0.000	0.000	0.048	0.000
OF	193.000	-0.312	0.000	9.326	0.000	0.000	0.000	0.000	0.048	0.000
OF	194.000	-0.264	0.000	9.326	0.000	0.000	0.000	0.000	0.048	0.000

	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	28.000	-15.655	0.000	9.326	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	29.000	-15.483	0.000	9.326	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	30.000	-15.312	0.000	9.326	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	31.000	-15.140	0.000	9.326	0.000	0.000	0.000	0.000		0.172	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	32.000	-14.968	0.000	9.326	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	33.000	-14.797	0.000	9.326	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	34.000	-14.625	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	35.000	-14.454	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	36.000	-14.283	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	37.000	-14.111	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	38.000	-13.940	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	39.000	-13.768	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	40.000	-13.597	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	41.000	-13.425	0.000	9.325	0.000	0.000	0.000	0.000		0.172	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	42.000	-13.253	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	43.000	-13.082	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	44.000	-12.910	0.000	9.325	0.000	0.000	0.000	0.000		0.172	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	45.000	-12.738	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	46.000	-12.567	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	47.000	-12.395	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	48.000	-12.224	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	49.000	-12.053	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	50.000	-11.881	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	51.000	-11.710	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	52.000	-11.538	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	53.000	-11.367	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	54.000	-11.195	0.000	9.325	0.000	0.000	0.000	0.000		0.172	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	55.000	-11.023	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	56.000	-10.852	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	57.000	-10.680	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	58.000	-10.509	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	59.000	-10.337	0.000	9.325	0.000	0.000	0.000	0.000		0.171	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	60.000	-10.166	0.000	9.325	0.000	0.000	0.000	0.000		0.152	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	61.000	-10.033	0.000	9.325	0.000	0.000	0.000	0.000		0.131	0.000

	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	62.000	-9.903	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	63.000	-9.773	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	64.000	-9.643	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	65.000	-9.512	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	66.000	-9.382	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	67.000	-9.252	0.000	9.325	0.000	0.000	0.000	0.000		0.131	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	68.000	-9.121	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	69.000	-8.991	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	70.000	-8.861	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	71.000	-8.731	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	72.000	-8.600	0.000	9.325	0.000	0.000	0.000	0.000		0.131	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	73.000	-8.470	0.000	9.325	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	74.000	-8.340	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	75.000	-8.209	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	76.000	-8.079	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	77.000	-7.949	0.000	9.324	0.000	0.000	0.000	0.000		0.131	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	78.000	-7.818	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	79.000	-7.688	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	80.000	-7.558	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	81.000	-7.427	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	82.000	-7.297	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	83.000	-7.167	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	84.000	-7.037	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	85.000	-6.906	0.000	9.324	0.000	0.000	0.000	0.000		0.131	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	86.000	-6.776	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	87.000	-6.646	0.000	9.324	0.000	0.000	0.000	0.000		0.130	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	88.000	-6.515	0.000	9.324	0.000	0.000	0.000	0.000		0.128	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	89.000	-6.390	0.000	9.324	0.000	0.000	0.000	0.000		0.122	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	90.000	-6.272	0.000	9.324	0.000	0.000	0.000	0.000		0.118	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	91.000	-6.155	0.000	9.324	0.000	0.000	0.000	0.000		0.117	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	92.000	-6.037	0.000	9.324	0.000	0.000	0.000	0.000		0.117	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	93.000	-5.919	0.000	9.324	0.000	0.000	0.000	0.000		0.118	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	94.000	-5.802	0.000	9.324	0.000	0.000	0.000	0.000		0.118	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	95.000	-5.684	0.000	9.324	0.000	0.000	0.000	0.000		0.118	0.000

	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	96.000	-5.567	0.000	9.324	0.000	0.000	0.000	0.117	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	97.000	-5.449	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	98.000	-5.332	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	99.000	-5.214	0.000	9.324	0.000	0.000	0.000	0.117	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	100.000	-5.097	0.000	9.324	0.000	0.000	0.000	0.117	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	101.000	-4.979	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	102.000	-4.861	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	103.000	-4.744	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	104.000	-4.626	0.000	9.324	0.000	0.000	0.000	0.117	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	105.000	-4.509	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	106.000	-4.391	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	107.000	-4.274	0.000	9.324	0.000	0.000	0.000	0.117	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	108.000	-4.156	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	109.000	-4.038	0.000	9.324	0.000	0.000	0.000	0.118	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	110.000	-3.921	0.000	9.324	0.000	0.000	0.000	0.112	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	111.000	-3.814	0.000	9.324	0.000	0.000	0.000	0.073	0.000	
	END	END	NEW SURGE	NEW SURGE				BOTTOM	AVERAGE	
OF	STATION ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES	
	112.000	-3.774	0.000	9.324	0.000	0.000	0.000	0.040	0.000	

	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	130.000	-3.056	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	131.000	-3.016	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	132.000	-2.976	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	133.000	-2.936	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	134.000	-2.896	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	135.000	-2.856	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	136.000	-2.816	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	137.000	-2.777	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	138.000	-2.737	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	139.000	-2.697	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	140.000	-2.657	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	141.000	-2.617	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	142.000	-2.577	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	143.000	-2.537	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	144.000	-2.497	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	145.000	-2.457	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	146.000	-2.418	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	147.000	-2.378	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	148.000	-2.338	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	149.000	-2.298	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	150.000	-2.258	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	151.000	-2.218	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	152.000	-2.178	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	153.000	-2.138	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	154.000	-2.099	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	155.000	-2.059	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	156.000	-2.019	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	157.000	-1.979	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	158.000	-1.939	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	159.000	-1.899	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	160.000	-1.859	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	161.000	-1.819	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	162.000	-1.779	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	163.000	-1.740	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000

	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	164.000	-1.700	0.000	9.323	0.000	0.000	0.000	0.000		0.040	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	165.000	-1.660	0.000	9.323	0.000	0.000	0.000	0.000		0.044	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	166.000	-1.611	0.000	9.323	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	167.000	-1.563	0.000	9.323	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	168.000	-1.515	0.000	9.323	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	169.000	-1.467	0.000	9.323	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	170.000	-1.419	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	171.000	-1.371	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	172.000	-1.323	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	173.000	-1.275	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	174.000	-1.226	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	175.000	-1.178	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	176.000	-1.130	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	177.000	-1.082	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	178.000	-1.034	0.000	9.324	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	179.000	-0.986	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	180.000	-0.938	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	181.000	-0.889	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	182.000	-0.841	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	183.000	-0.793	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	184.000	-0.745	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	185.000	-0.697	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	186.000	-0.649	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	187.000	-0.601	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	188.000	-0.552	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	189.000	-0.504	0.000	9.325	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	190.000	-0.456	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	191.000	-0.408	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	192.000	-0.360	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	193.000	-0.312	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	194.000	-0.264	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	195.000	-0.215	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	196.000	-0.167	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000
	END	END	NEW SURGE	NEW SURGE						BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR						SLOPE	A-ZONES
	197.000	-0.119	0.000	9.326	0.000	0.000	0.000	0.000		0.048	0.000

	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	198.000	-0.071	0.000	9.326	0.000	0.000	0.000	0.000	0.048	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	199.000	-0.023	0.000	9.326	0.000	0.000	0.000	0.000	-0.183	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
OF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	201.500	-0.712	0.000	9.327	0.000	0.000	0.000	0.000	0.016	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	205.000	0.075	0.000	9.327	0.000	0.000	0.000	0.000	0.169	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	212.000	1.060	0.000	9.328	0.000	0.000	0.000	0.000	0.051	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	220.500	0.863	0.000	9.328	0.000	0.000	0.000	0.000	0.054	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	223.000	1.650	0.000	9.328	0.000	0.000	0.000	0.000	0.134	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	230.500	2.208	0.000	9.328	0.000	0.000	0.000	0.000	0.105	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	245.500	4.012	0.000	9.328	0.000	0.000	0.000	0.000	0.216	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	252.600	6.987	0.000	9.518	0.000	0.000	0.000	0.000	0.418	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	255.900	8.357	0.000	9.878	0.000	0.000	0.000	0.000	0.415	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	259.200	9.727	0.000	10.265	0.000	0.000	0.000	0.000	0.415	0.000
	END	END	NEW SURGE	NEW SURGE					BOTTOM	AVERAGE
IF	STATION	ELEVATION	10-YEAR	100-YEAR					SLOPE	A-ZONES
	260.500	10.265	0.000	10.265	0.000	0.000	0.000	0.000	0.414	0.000
-----END OF TRANSECT-----										

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

1

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	7.12	11.61
OF	1.00	7.13	11.62
OF	2.00	7.13	11.62
OF	3.00	7.13	11.62
OF	4.00	7.13	11.62
OF	5.00	7.13	11.62
OF	6.00	7.13	11.62
OF	7.00	7.13	11.62
OF	8.00	7.13	11.62
OF	9.00	7.13	11.62
OF	10.00	7.13	11.62
OF	11.00	7.14	11.62
OF	12.00	7.14	11.62
OF	13.00	7.14	11.62
OF	14.00	7.14	11.62
OF	15.00	7.14	11.62
OF	16.00	7.14	11.62
OF	17.00	7.14	11.62
OF	18.00	7.14	11.62
OF	19.00	7.14	11.62
OF	20.00	7.14	11.62
OF	21.00	7.15	11.62
OF	22.00	7.15	11.62
OF	23.00	7.15	11.62
OF	24.00	7.15	11.62
OF	25.00	7.15	11.62
OF	26.00	7.15	11.62
OF	27.00	7.17	11.62
OF	28.00	7.18	11.62
OF	29.00	7.20	11.62
OF	30.00	7.21	11.62
OF	31.00	7.23	11.62
OF	32.00	7.25	11.62
OF	33.00	7.26	11.62
OF	34.00	7.28	11.62
OF	35.00	7.30	11.62
OF	36.00	7.31	11.62
OF	37.00	7.33	11.62
OF	38.00	7.35	11.62
OF	39.00	7.36	11.62
OF	40.00	7.38	11.62
OF	41.00	7.40	11.62
OF	42.00	7.42	11.62
OF	43.00	7.44	11.62
OF	44.00	7.46	11.62
OF	45.00	7.48	11.62
OF	46.00	7.49	11.62
OF	47.00	7.51	11.62
OF	48.00	7.53	11.62
OF	49.00	7.55	11.62
OF	50.00	7.57	11.62
OF	51.00	7.60	11.62
OF	52.00	7.62	11.62
OF	53.00	7.64	11.62
OF	54.00	7.66	11.62

OF	55.00	7.68	11.62	14.70
OF	56.00	7.70	11.62	14.72
OF	57.00	7.73	11.62	14.73
OF	58.00	7.75	11.62	14.75
OF	59.00	7.77	11.62	14.77
OF	60.00	7.79	11.62	14.78
OF	61.00	7.81	11.62	14.79
OF	62.00	7.83	11.62	14.81
OF	63.00	7.85	11.62	14.82
OF	64.00	7.87	11.62	14.83
OF	65.00	7.89	11.62	14.85
OF	66.00	7.91	11.62	14.86
OF	67.00	7.93	11.62	14.87
OF	68.00	7.95	11.62	14.89
OF	69.00	7.97	11.62	14.90
OF	70.00	7.99	11.62	14.92
OF	71.00	8.01	11.62	14.93
OF	72.00	8.03	11.62	14.94
OF	73.00	8.05	11.62	14.96
OF	74.00	8.07	11.62	14.97
OF	75.00	8.09	11.62	14.99
OF	76.00	8.11	11.62	15.00
OF	77.00	8.13	11.62	15.02
OF	78.00	8.16	11.62	15.03
OF	79.00	8.18	11.62	15.05
OF	80.00	8.20	11.62	15.07
OF	81.00	8.23	11.62	15.08
OF	82.00	8.25	11.62	15.10
OF	83.00	8.27	11.62	15.11
OF	84.00	8.30	11.62	15.13
OF	85.00	8.32	11.62	15.15
OF	86.00	8.35	11.62	15.17
OF	87.00	8.37	11.62	15.18
OF	88.00	8.40	11.62	15.20
OF	89.00	8.42	11.62	15.22
OF	90.00	8.44	11.62	15.24
OF	91.00	8.47	11.62	15.25
OF	92.00	8.49	11.62	15.27
OF	93.00	8.52	11.62	15.29
OF	94.00	8.52	11.62	15.29
OF	95.00	8.51	11.62	15.28
OF	96.00	8.50	11.62	15.27
OF	97.00	8.48	11.62	15.26
OF	98.00	8.47	11.62	15.25
OF	99.00	8.46	11.62	15.25
OF	100.00	8.45	11.62	15.24
OF	101.00	8.44	11.62	15.23
OF	102.00	8.42	11.62	15.22
OF	103.00	8.41	11.62	15.21
OF	104.00	8.40	11.62	15.20
OF	105.00	8.39	11.62	15.19
OF	106.00	8.37	11.62	15.18
OF	107.00	8.36	11.62	15.18
OF	108.00	8.35	11.62	15.17
OF	109.00	8.33	11.62	15.16
OF	110.00	8.32	11.62	15.15
OF	111.00	8.30	11.62	15.14
OF	112.00	8.30	11.62	15.13
OF	113.00	8.30	11.62	15.13
OF	114.00	8.29	11.62	15.13
OF	115.00	8.29	11.62	15.13
OF	116.00	8.29	11.62	15.12
OF	117.00	8.28	11.62	15.12
OF	118.00	8.28	11.62	15.12
OF	119.00	8.27	11.62	15.12
OF	120.00	8.27	11.62	15.11
OF	121.00	8.26	11.62	15.11
OF	122.00	8.26	11.62	15.11
OF	123.00	8.26	11.62	15.10
OF	124.00	8.25	11.62	15.10
OF	125.00	8.25	11.62	15.10
OF	126.00	8.24	11.62	15.09
OF	127.00	8.24	11.62	15.09
OF	128.00	8.23	11.62	15.09
OF	129.00	8.23	11.62	15.08
OF	130.00	8.23	11.62	15.08
OF	131.00	8.22	11.62	15.08
OF	132.00	8.22	11.62	15.08
OF	133.00	8.21	11.62	15.07
OF	134.00	8.21	11.62	15.07
OF	135.00	8.20	11.62	15.07
OF	136.00	8.20	11.62	15.06
OF	137.00	8.19	11.62	15.06
OF	138.00	8.19	11.62	15.06
OF	139.00	8.18	11.62	15.05
OF	140.00	8.18	11.62	15.05
OF	141.00	8.18	11.62	15.05
OF	142.00	8.17	11.62	15.04
OF	143.00	8.17	11.62	15.04
OF	144.00	8.16	11.62	15.04
OF	145.00	8.16	11.62	15.03
OF	146.00	8.15	11.62	15.03
OF	147.00	8.15	11.62	15.02
OF	148.00	8.14	11.62	15.02
OF	149.00	8.14	11.62	15.02
OF	150.00	8.13	11.62	15.01
OF	151.00	8.12	11.62	15.01
OF	152.00	8.12	11.62	15.01
OF	153.00	8.11	11.62	15.00
OF	154.00	8.11	11.62	15.00
OF	155.00	8.10	11.62	15.00
OF	156.00	8.10	11.62	14.99

OF	157.00	8.09	11.62	14.99
OF	158.00	8.09	11.62	14.98
OF	159.00	8.08	11.62	14.98
OF	160.00	8.08	11.62	14.98
OF	161.00	8.07	11.62	14.97
OF	162.00	8.06	11.62	14.97
OF	163.00	8.06	11.62	14.96
OF	164.00	8.05	11.62	14.96
OF	165.00	8.05	11.62	14.96
OF	166.00	8.04	11.62	14.95
OF	167.00	8.03	11.62	14.95
OF	168.00	8.02	11.62	14.94
OF	169.00	8.02	11.62	14.94
OF	170.00	8.01	11.62	14.93
OF	171.00	8.00	11.62	14.93
OF	172.00	7.99	11.62	14.92
OF	173.00	7.99	11.62	14.91
OF	174.00	7.98	11.62	14.91
OF	175.00	7.97	11.62	14.90
OF	176.00	7.96	11.62	14.90
OF	177.00	7.93	11.62	14.87
OF	178.00	7.89	11.62	14.85
OF	179.00	7.86	11.62	14.83
OF	180.00	7.82	11.62	14.80
OF	181.00	7.79	11.62	14.77
OF	182.00	7.75	11.62	14.75
OF	183.00	7.71	11.62	14.72
OF	184.00	7.68	11.62	14.70
OF	185.00	7.64	11.62	14.67
OF	186.00	7.61	11.62	14.65
OF	187.00	7.57	11.62	14.62
OF	188.00	7.53	11.62	14.60
OF	189.00	7.50	11.62	14.57
OF	190.00	7.46	11.62	14.55
OF	191.00	7.43	11.62	14.53
OF	192.00	7.39	11.62	14.50
OF	193.00	7.36	11.62	14.48
OF	194.00	7.32	11.62	14.45
OF	195.00	7.28	11.62	14.42
OF	196.00	7.25	11.62	14.40
OF	197.00	7.21	11.62	14.37
OF	198.00	7.18	11.62	14.35
OF	199.00	7.14	11.62	14.32
OF	201.50	7.27	11.62	14.42
IF	205.00	7.07	11.62	14.27
IF	212.00	6.33	11.62	13.76
IF	220.50	6.37	11.62	13.79
IF	223.00	5.89	11.62	13.45
IF	230.50	5.46	11.62	13.15
IF	245.50	4.10	11.62	12.20
IF	252.60	1.96	11.62	10.89
IF	255.90	1.18	11.62	10.71
IF	259.20	0.42	11.62	10.56
IF	260.50	0.01	11.62	10.27

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
34.00	1.00	9.32
74.00	1.00	9.32
128.00	1.00	9.32
170.00	1.00	9.32
179.00	1.00	9.32
190.00	1.00	9.33
201.50	1.00	9.33
212.00	1.00	9.33
252.60	1.00	9.52
255.90	1.00	9.88
259.20	1.00	10.27

PART5 LOCATION OF V ZONES

STATION OF GUTTER	LOCATION OF ZONE
249.15	WINDWARD

PART6 NUMBERED A ZONES AND V ZONES

STATION OF GUTTER	ELEVATION	ZONE DESIGNATION	FHF
0.00	14.31		
		V23 EL=14	130
33.00	14.41		
		V23 EL=14	130
34.00	14.42		
		V23 EL=14	130
40.57	14.50		
		V23 EL=15	130
73.00	14.96		
		V23 EL=15	130
74.00	14.97		
		V23 EL=15	130
127.00	15.09		
		V23 EL=15	130
128.00	15.09		
		V23 EL=15	130
169.00	14.94		
		V23 EL=15	130
170.00	14.93		
		V23 EL=15	130
178.00	14.85		
		V23 EL=15	130
179.00	14.83		
		V23 EL=15	130
189.00	14.57		
		V23 EL=15	130
190.00	14.55		
		V23 EL=15	130

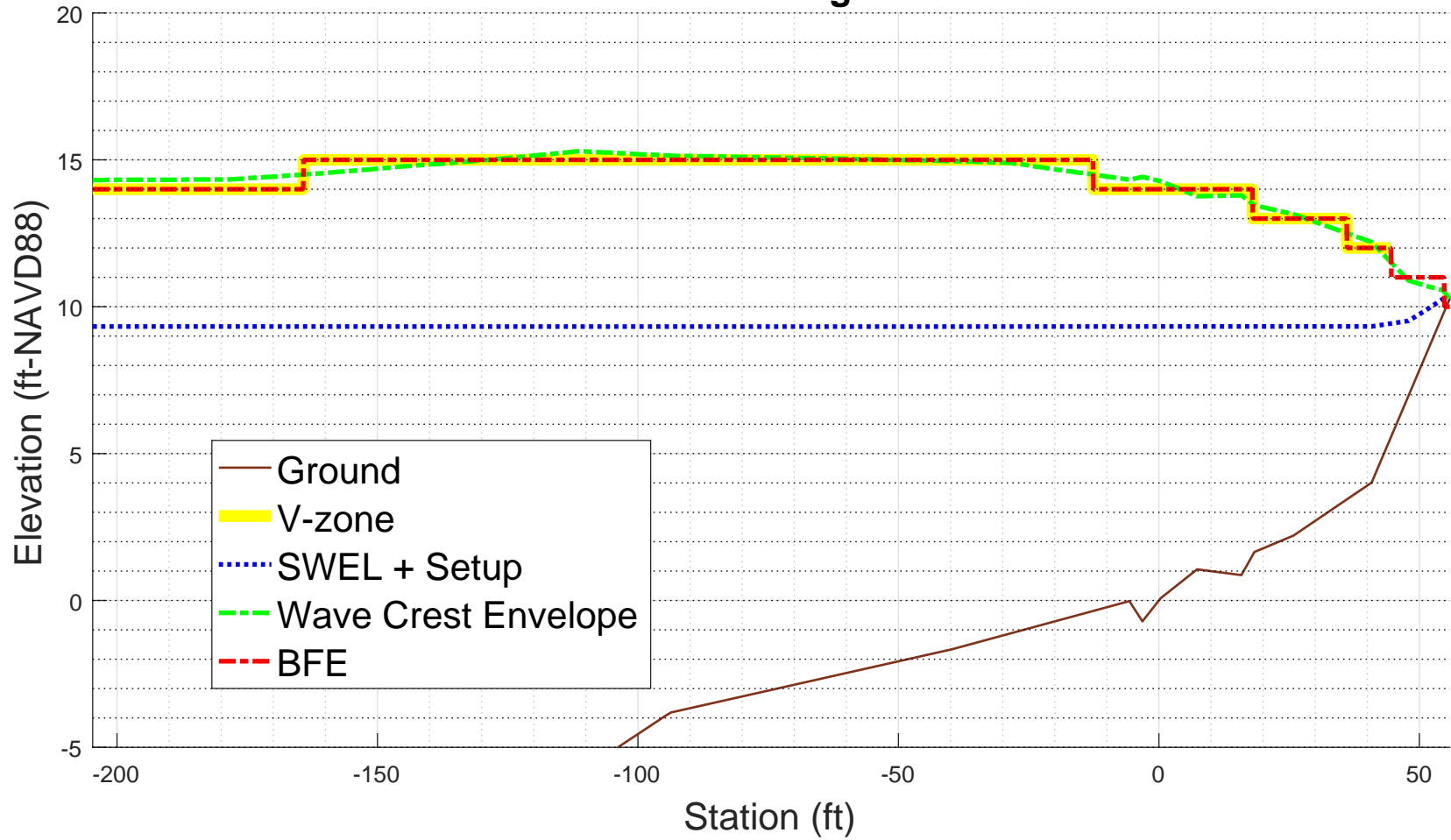
192.01	14.50			
199.00	14.32	V23	EL=14	130
201.50	14.42	V23	EL=14	130
205.00	14.27	V23	EL=14	130
212.00	13.76	V23	EL=14	130
222.62	13.50	V23	EL=13	130
240.73	12.50	V23	EL=12	130
245.50	12.20	V23	EL=12	130
249.15	11.52	A20	EL=12	100
249.29	11.50	A20	EL=11	100
252.60	10.89	A20	EL=11	100
255.90	10.71	A20	EL=11	100
259.20	10.56	A20	EL=11	100
259.46	10.50	A20	EL=11	100
260.50	10.27	A20	EL=10	100

ZONE TERMINATED AT END OF TRANSECT
PART 7 POSTSCRIPT NOTES

PS# 1 START(383992.3704,4802357.5308)
PS# 2 END(384045.7135,4802549.4425)

-1.000000e+00

YK-99-2
100-year WHAFIS Output
Zero Station: -70.43156540, 43.36566478
Onshore Dir: 74.5 deg CCW from E



PART 4: TAW

Input Paramters:

TWL- 9.3261 feet
HS- 5.0379 feet
PER- 11.3516 seconds
TOE- x: 1622.5 , z: 0.86286 feet
TOP- x: 1675 , z: 11.5584 feet
GBERM- 0.94117
GGROUGH- 1
GBETA- 1
GPERM- 1

RUNNING TAW:

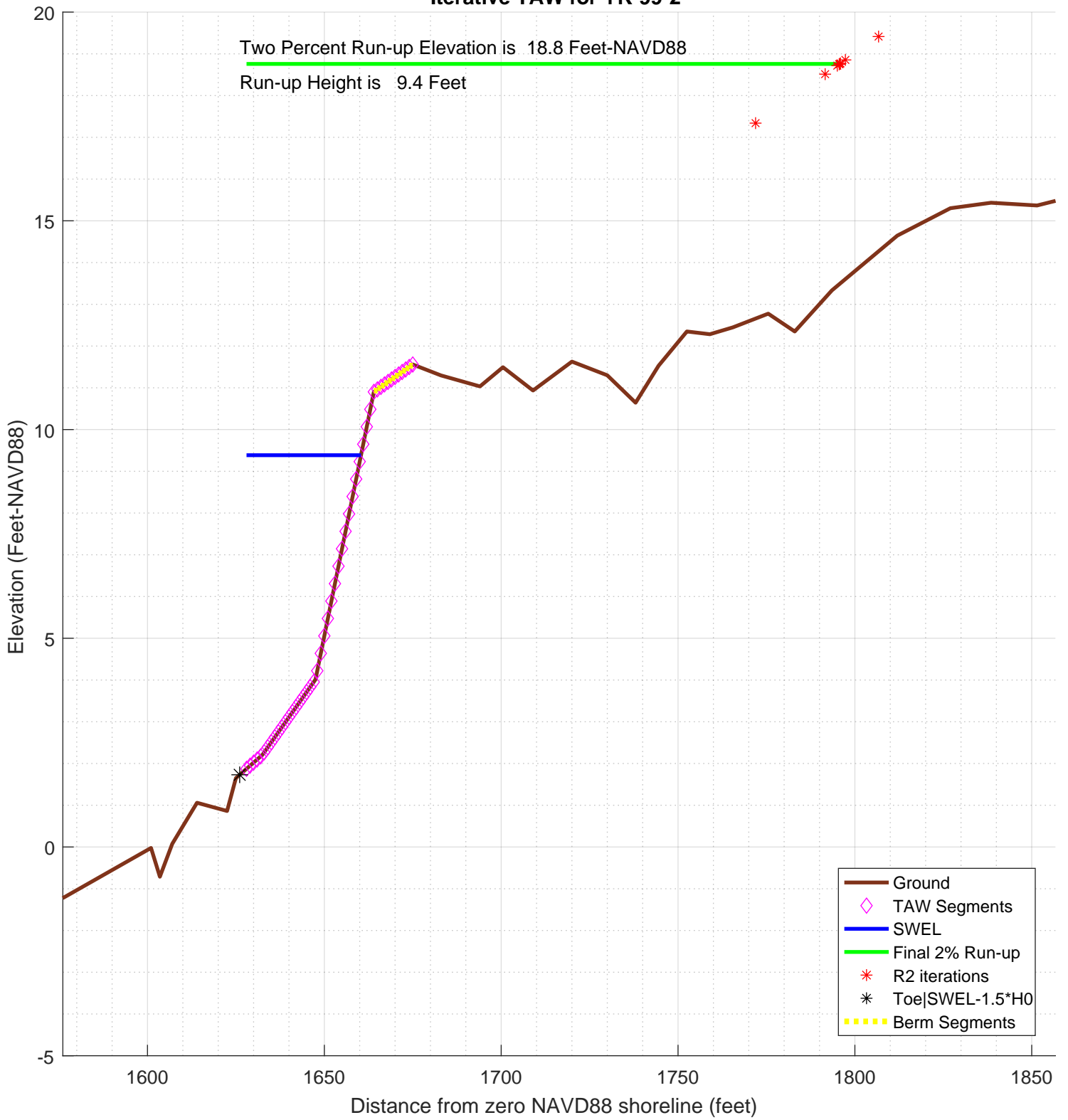
...
MATLAB DIARY: /4_taw/logfiles/YK-99-2-DIARY.txt

CHECKING VALIDITY:

...
TAW method is not valid!
Runup elevation to be calculated using another method

PART 4 COMPLETE

Iterative TAW for YK-99-2



```

diary on          % begin recording

% FEMA appeal for The Town of Kennebunkport, York county, Maine
% TRANSECT ID: YK-99-2
% calculation by SJH, Ransom Consulting, Inc. 02-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/YK-99-2sta_ele_include.csv'; % file with station, elevation, include
% third column is 0 for excluded points
imgname='logfiles/YK-99-2-runup';
SWEL=9.3261; % 100-yr still water level including wave setup.
H0=5.0379; % significant wave height at toe of structure
Tp=11.3516; % peak period, 1/fma,
T0=Tp/1.1;

gamma_berm=0.94117; % this may get changed automatically below
gamma_rough=1;
gamma_beta=1;
gamma_perm=1;

setupAtToe=-0.039442;
maxSetup=0.93903; % only used in case of berm/shallow foreshore weighted average

plotTitle='Iterative TAW for YK-99-2'

plotTitle =

Iterative TAW for YK-99-2

% END CONFIG
%-----

SWEL=SWEL+setupAtToe

SWEL =

          9.286658

SWEL_fore=SWEL+maxSetup

SWEL_fore =

          10.225688

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

L0 =

          544.916423199444

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

Ztoe =

    1.729808

% 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 =

    16.843508

% 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 =

    1626.06965548772

% 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 =

    1763.60050963102

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

top_sta =

    1763.60050963102

toe_sta

toe_sta =

    1626.06965548772

% 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 40.4 ft landward of toe of slope

ans =

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

ans =

-!!-      setup is adjusted to 0.06 feet

ans =

-!!-      SWEL is adjusted to 9.39 feet

k =

    1
    2
    3
    4
    5
    6

% 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('!!! - - Iribarren number: %6.2f is outside the valid range (0.5-10), TAW NOT VALID - - !!!\n', Irb*gamma_berm)
    TAW_VALID=0;
else
    sprintf('!!! - - Iribarren number: %6.2f is in the valid range (0.5-10), TAW RECOMMENDED - - !!!\n', Irb*gamma_berm)
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 berm')
end

```



```

% 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 =
    1.729808
toe_sta =
    1626.06965548772
top_sta =
    1763.60050963102
Z2 =
    16.843508
H0 =
    5.0379
Tp =
    11.3516
T0 =
    10.3196363636364
R2 =
    15.1137
Z2 =
    24.4989728103088
top_sta =
    1891.93808670951
Lslope =
    265.868431221787
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 37
dh =
    -1.54678418969124
rdh_sum =
    0.0256219611509224
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.0532395156699975
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 39

```

```

dh =
    -1.66608768969124
rdh_sum =
    0.0829252725026096
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.114751539044794
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.148790312450615
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.185113212627531
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.223791526559033
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.264896179100873
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.308497722076877
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    0.354666345242235
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    0.403471800648496
ans =
!----- End Berm Factor Calculation, Iter: 1 -----!
berm_width =
    11
rB =
    0.0413738477691765
rdh_mean =
    0.0366792546044087
gamma_berm =
    0.960143714127113
slope =
    0.0893369363210579
Irb =
    0.929118766642681
gamma_berm =
    0.960143714127113
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.960143714127113
ans =
!!! - - Iribaren number: 0.89 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:11.2 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    7.95481866838369
R2del =
    7.1588813316163
Z2 =
    17.3400914786925
ans =
!----- STARTING ITERATION 2 -----!
Ztoe =
    1.729808

```

```

toe_sta =
    1626.06965548772
top_sta =
    1771.92532361054
Z2 =
    17.3400914786925
H0 =
    5.0379
Tp =
    11.3516
T0 =
    10.3196363636364
R2 =
    7.95481866838369
Z2 =
    17.3400914786925
top_sta =
    1771.92532361054
Lslope =
    145.855668122821
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 37
dh =
    -1.54678418969124
rdh_sum =
    0.0904254034272675
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.187720127674867
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 39
dh =
    -1.66608768969124
rdh_sum =
    0.2921076011301
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.403807372624405
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.523034996951388
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.650001725062773
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.784914575223744
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.927976155925547
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    1.07938455344603
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    1.23933329430215
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    1.40801102230549
ans =
!----- End Berm Factor Calculation, Iter: 2 -----!
berm_width =
    11

```

```

rB =
    0.07541702109744
rdh_mean =
    0.128001002027772
gamma_berm =
    0.934236433172982
slope =
    0.115755486558231
Irb =
    1.20387601514107
gamma_berm =
    0.934236433172982
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.934236433172982
ans =
!!! - - Iribaren number: 1.12 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:8.6 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    10.0290863585598
R2del =
    2.0742676901761
Z2 =
    19.4143591688686
ans =
!----- STARTING ITERATION 3 -----!
Ztoe =
    1.729808
toe_sta =
    1626.06965548772
top_sta =
    1806.69871701847
Z2 =
    19.4143591688686
H0 =
    5.0379
Tp =
    11.3516
T0 =
    10.3196363636364
R2 =
    10.0290863585598
Z2 =
    19.4143591688686
top_sta =
    1806.69871701847
Lslope =
    180.629061530746
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 37
dh =
    -1.54678418969124
rdh_sum =
    0.0575522845257002
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.119533397816781
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 39
dh =
    -1.66608768969124
rdh_sum =
    0.186096235692182
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.257392130759526
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.333570804650896
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.414780192346405

```

```

ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.50116651267763
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.592874176973738
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.690045738640926
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    0.792821890951963
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    0.901341276410312
ans =
!----- End Berm Factor Calculation, Iter: 3 -----!
berm_width =
    11
rB =
    0.0608982846214235
rdh_mean =
    0.0819401160373011
gamma_berm =
    0.944091727886929
slope =
    0.104254253423805
Irb =
    1.08426130721864
gamma_berm =
    0.944091727886929
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.944091727886929
ans =
!!! - - Iribaren number: 1.02 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:9.6 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    9.12790184453968
R2del =
    0.901184514020114
Z2 =
    18.5131746548484
ans =
!----- STARTING ITERATION 4 -----!
Ztoe =
    1.729808
toe_sta =
    1626.06965548772
top_sta =
    1791.59109914081
Z2 =
    18.5131746548484
H0 =
    5.0379
Tp =
    11.3516
T0 =
    10.3196363636364
R2 =
    9.12790184453968
Z2 =
    18.5131746548484
top_sta =
    1791.59109914081
Lslope =
    165.521443653089
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 37

```

```

dh =
    -1.54678418969124
rdh_sum =
    0.0691950822850872
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.143690982738681
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 39
dh =
    -1.66608768969124
rdh_sum =
    0.223667002294197
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.309300175757282
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.400765203122065
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.498234228568711
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.601876913821702
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.711860318485847
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.828348829632762
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    0.951504149064295
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    1.081485056849
ans =
!----- End Berm Factor Calculation, Iter: 4 -----!
berm_width =
    11
rB =
    0.0664566460829966
rdh_mean =
    0.0983168233499088
gamma_berm =
    0.940077160250373
slope =
    0.108615129771427
Irb =
    1.12961513532645
gamma_berm =
    0.940077160250373
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.940077160250373
ans =
!!! - - Iribaren number: 1.06 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!

```

```

ans =
!!! - - slope: 1:9.2 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    9.46927682989579
R2del =
    0.34137498535611
Z2 =
    18.8545496402046
ans =
!----- STARTING ITERATION 5 -----!
Ztoe =
    1.729808
toe_sta =
    1626.06965548772
top_sta =
    1797.31397026378
Z2 =
    18.8545496402046
H0 =
    5.0379
Tp =
    11.3516
T0 =
    10.3196363636364
R2 =
    9.46927682989579
Z2 =
    18.8545496402046
top_sta =
    1797.31397026378
Lslope =
    171.244314776056
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 37
dh =
    -1.54678418969124
rdh_sum =
    0.064404034091573
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.133751062296208
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 39
dh =
    -1.66608768969124
rdh_sum =
    0.208209707506491
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.287946631389085
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.373126474698892
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.463911655250388
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.560462440484243
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.6629368397638
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.771490542491301
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 46
dh =
    -2.08364918969124

```

```

rdh_sum =
    0.886276910010338
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    1.0074467581845
ans =
!----- End Berm Factor Calculation, Iter: 5 -----!
berm_width =
    11
rB =
    0.0642357091643316
rdh_mean =
    0.0915860689258636
gamma_berm =
    0.941647386922695
slope =
    0.106866453665683
Irb =
    1.11142861748139
gamma_berm =
    0.941647386922695
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.941647386922695
ans =
!!! - Iribaren number: 1.05 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - slope: 1:9.4 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    9.33238591641954
R2del =
    0.136890913476247
Z2 =
    18.7176587267283
ans =
!----- STARTING ITERATION 6 -----!
Ztoe =
    1.729808
toe_sta =
    1626.06965548772
top_sta =
    1795.01910658209
Z2 =
    18.7176587267283
H0 =
    5.0379
Tp =
    11.3516
T0 =
    10.3196363636364
R2 =
    9.33238591641954
Z2 =
    18.7176587267283
top_sta =
    1795.01910658209
Lslope =
    168.94945109437
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 37
dh =
    -1.54678418969124
rdh_sum =
    0.0662641152074591
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.137610313555862
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 39
dh =
    -1.66608768969124
rdh_sum =
    0.214211394848707
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.296238081884604

```



```

ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.383858957341145
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.477240254431518
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.57654592984021
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.681937551425475
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.793574233071974
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    0.911612624840858
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    1.03620668818343
ans =
!----- End Berm Factor Calculation, Iter: 6 -----!
berm_width =
    11
rB =
    0.0651082316559627
rdh_mean =
    0.0942006080166755
gamma_berm =
    0.94102500335292
slope =
    0.10755245180674
Irb =
    1.11856311048043
gamma_berm =
    0.94102500335292
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.94102500335292
ans =
!!! - - Iribaren number: 1.05 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:9.3 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    9.38608460262104
R2del =
    0.0536986862014981
Z2 =
    18.7713574129298
ans =
!----- STARTING ITERATION 7 -----!
Ztoe =
    1.729808
toe_sta =
    1626.06965548772
top_sta =
    1795.91932093226
Z2 =
    18.7713574129298
H0 =
    5.0379
Tp =
    11.3516

```

```

T0 =
    10.3196363636364
R2 =
    9.38608460262104
Z2 =
    18.7713574129298
top_sta =
    1795.91932093226
Lslope =
    169.849665444532
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 37
dh =
    -1.54678418969124
rdh_sum =
    0.065525042965719
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 38
dh =
    -1.60643618969124
rdh_sum =
    0.136076929715519
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 39
dh =
    -1.66608768969124
rdh_sum =
    0.211826805172205
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 40
dh =
    -1.72573918969124
rdh_sum =
    0.292943783651279
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 41
dh =
    -1.78539118969124
rdh_sum =
    0.379594887117465
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 42
dh =
    -1.84504268969124
rdh_sum =
    0.471944838755677
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 43
dh =
    -1.90469418969124
rdh_sum =
    0.57015613576958
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 44
dh =
    -1.96434568969124
rdh_sum =
    0.674388938917062
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.784801008667059
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    0.90154769605345
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    1.0247817208195
ans =
!----- End Berm Factor Calculation, Iter: 7 -----!
berm_width =
    11
rB =
    0.0647631537643051
rdh_mean =
    0.0931619746199547
gamma_berm =
    0.941270309522993
slope =
    0.107280990269888
Irb =
    1.1157398660454

```

```

gamma_berm =
0.941270309522993
gamma_perm =
1
gamma_beta =
1
gamma_rough =
1
gamma =
0.941270309522993
ans =
!!! - - Iribaren number: 1.05 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:9.3 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
9.36483478604849
R2del =
0.021249816572551
Z2 =
18.7501075963573
ans =
!----- STARTING ITERATION 8 -----!
Ztoe =
1.729808
toe_sta =
1626.06965548772
top_sta =
1795.56308521831
Z2 =
18.7501075963573
H0 =
5.0379
Tp =
11.3516
T0 =
10.3196363636364
R2 =
9.36483478604849
Z2 =
18.7501075963573
top_sta =
1795.56308521831
Lslope =
169.493429730587
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 37
dh =
-1.54678418969124
rdh_sum =
0.0658160375402676
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 38
dh =
-1.60643618969124
rdh_sum =
0.136680672223293
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 39
dh =
-1.66608768969124
rdh_sum =
0.212765701294397
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 40
dh =
-1.72573918969124
rdh_sum =
0.294240873185609
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 41
dh =
-1.78539118969124
rdh_sum =
0.381273825233258
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 42
dh =
-1.84504268969124
rdh_sum =
0.474029876102721
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 43
dh =
-1.90469418969124
rdh_sum =
0.572672098642466
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 44
dh =
-1.96434568969124

```

```

rdh_sum =
    0.677361208699018
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 45
dh =
    -2.02399718969124
rdh_sum =
    0.788255500761444
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 46
dh =
    -2.08364918969124
rdh_sum =
    0.905510838539324
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 47
dh =
    -2.14330068969124
rdh_sum =
    1.02928043195394
ans =
!----- End Berm Factor Calculation, Iter: 8 -----!
berm_width =
    11
rB =
    0.0648992708300535
rdh_mean =
    0.0935709483594489
gamma_berm =
    0.941173415489351
slope =
    0.107388045203445
Irb =
    1.11685325488461
gamma_berm =
    0.941173415489351
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    1
gamma =
    0.941173415489351
ans =
!!! - - Iribaren number: 1.05 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:9.3 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
    9.37321491298903
R2del =
    0.00838012694054058
Z2 =
    18.7584877232978
% final 2% runup elevation
Z2=R2_new+SWEL
Z2 =
    18.7584877232978
diary off
-1.000000e+00

```

PART 5: RUNUP2

for transect: YK-99-2

Station locations shifted by: 49.28 feet from their
original location to set the shoreline to
elevation 0 for RUNUP2 input

RUNUP2 INPUT CONVERSIONS

for transect: YK-99-2

Incident significant wave height: 4.45 feet

Peak wave period: 11.62 seconds

Mean wave height: 2.79 feet

Local Depth below SWEL: 25.56 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 Jersey

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

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

Depth, $D = 25.56$

Period, $T = 9.87$

Waveheight, $H = 2.79$

Deep water wavelength, $L0$ (ft)

$L0 = g \cdot T^2 / 2\pi$

$L0 = 32.17 \cdot 9.87^2 / 6.28 = 499.12$

Deep water wave celerity, $C0$ (ft/s)

$C0 = L0 / T$

$C0 = 499.12 / 9.87 = 50.56$

Angular frequency, σ (rad/s)

$\sigma = 2\pi / T$

$\sigma = 6.28 / 9.87 = 0.64$

Hunts (1979) approximation for Celerity $C1H$ (ft/s) at Depth D (ft)

$y = \sigma \cdot \sigma \cdot D / g$

$y = 0.64 \cdot 0.64 \cdot 25.56 / 32.17 = 0.32$

$C1H = \sqrt{g \cdot D / (y + 1. / (1 + 0.6522 \cdot y + 0.4622 \cdot y^2 + 0.0864 \cdot y^4 + 0.0675 \cdot y^5))}$

$C1H = 27.15$

Shoaling Coefficient KsH

$KsH = \sqrt{C0 / C1H}$

$KsH = \sqrt{50.56 / 27.15} = 1.36$

Deepwater Wave Height $H0_H$ (ft)

$H0_H = H / KsH$

$H0_H = 2.79 / 1.36 = 2.04$

Deepwater mean wave height: 2.04 feet

END RUNUP2 CONVERSIONS

RUNUP2 RESULTS

for transect: YK-99-2

RUNUP2 SWEL:

9.30

9.30

9.30

9.30

9.30
9.30
9.30
9.30
9.30

RUNUP2 deepwater mean wave heights:

1.94
1.94
1.94
2.04
2.04
2.04
2.15
2.15
2.15

RUNUP2 mean wave periods:

9.38
9.87
10.37
9.38
9.87
10.37
9.38
9.87
10.37

RUNUP2 runup above SWEL:

4.27
4.35
4.42
4.08
4.20
4.26
3.96
4.00
4.06

RUNUP2 Mean runup height above SWEL: 4.18 feet

RUNUP2 2-percent runup height above SWEL: 9.19 feet

RUNUP2 2-percent runup elevation: 18.49 feet-NAVD88

RUNUP2 Messages:

No Messages

_____END RUNUP2 RESULTS_____

_____ACES BEACH RUNUP_____

Incident significant wave height: 4.45 feet

Significant wave height is mean wave height divided by 0.626

Reference: D.2.8.1.2.1 Atlantic and Gulf of Mexico G&S Feb. 2007

Deepwater significant wave height: 3.26 feet

Peak wave period: 11.62 seconds

Average beach Slope: 1:9.82 (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	=	3.26
Wave Period,	T	=	11.62
Beach Slope,	S	=	0.102

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 = [10.2, 8.0, 7.3, 5.9, 3.8]

ACES RUNUP CALCULATED USING 'Aces_Beach_Runup.m'

ACES Beach 2-percent runup height above SWEL: 8.02 feet

ACES Beach 2-percent runup elevation: 17.32 feet-NAVD88

ACES BEACH RUNUP is valid

_____END ACES BEACH RESULTS_____

PART 5 COMPLETE_____

FEMA
RUNUP2 transect: YK-99-2

sjh

job 2
1

17.0
-16.24 1352.7 1.0
-16.02 1377.7 1.0
-16.00 1378.7 1.0
-10.17 1412.7 1.0
-10.03 1413.7 1.0
-6.52 1440.7 1.0
-6.39 1441.7 1.0
-3.92 1462.7 1.0
-3.81 1463.7 1.0
-1.66 1517.7 1.0
-0.02 1551.7 1.0
-0.02 1554.2 1.0
0.08 1557.7 1.0
1.06 1564.7 1.0
1.06 1573.2 1.0
1.65 1575.7 1.0
2.21 1583.2 1.0
4.01 1598.2 1.0
10.90 1614.7 1.0
1 11.56 1625.7 1.0
9.3 1.94 9.38
9.3 1.94 9.87
9.3 1.94 10.37
9.3 2.04 9.38
9.3 2.04 9.87
9.3 2.04 10.37
9.3 2.15 9.38
9.3 2.15 9.87
9.3 2.15 10.37

CLIENT- FEMA
PROJECT-RUNUP2 transect: YK-99-2

** WAVE RUNUP-VERSION 2.0 **

ENGINEERED BY sjh

JOB job 2
RUN 1 PAGE 1

CROSS SECTION PROFILE

	LENGTH	ELEV.	SLOPE	ROUGHNESS
1	1352.0	-16.2		
2	1377.0	-16.0	.00	1.00
3	1378.0	-16.0	FLAT	1.00
4	1412.0	-10.1	5.76	1.00
5	1413.0	-10.0	10.00	1.00
6	1440.7	-6.5	7.96	1.00
7	1441.7	-6.4	7.69	1.00
8	1462.7	-3.9	8.50	1.00
9	1463.7	-3.8	9.09	1.00
10	1517.7	-1.6	25.12	1.00
11	1551.7	.0	20.73	1.00
12	1554.2	.0	FLAT	1.00
13	1557.7	.1	35.00	1.00
14	1564.7	1.1	7.14	1.00
15	1573.2	1.1	FLAT	1.00
16	1575.7	1.7	4.24	1.00
17	1583.2	2.2	13.39	1.00
18	1598.2	4.0	8.33	1.00
19	1614.7	10.9	2.39	1.00
20	1625.7	11.6	16.67	1.00
	LAST SLOPE	17.00	LAST ROUGHNESS	1.00

CLIENT- FEMA
PROJECT-RUNUP2 transect: YK-99-2

** WAVE RUNUP-VERSION 2.0 **

ENGINEERED BY sjh

JOB job 2
RUN 1 PAGE 2

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.)
9.30	1.94	9.38	11	20	4.27	4.03
9.30	1.94	9.87	11	20	4.35	4.13
9.30	1.94	10.37	11	20	4.42	4.23
9.30	2.04	9.38	11	20	4.08	4.19
9.30	2.04	9.87	11	20	4.20	4.29
9.30	2.04	10.37	11	20	4.26	4.39
9.30	2.15	9.38	11	20	3.96	4.36
9.30	2.15	9.87	11	20	4.00	4.47
9.30	2.15	10.37	11	20	4.06	4.57

Runup2 2% runup elevation for Transect: YK-99-2

