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diary on          % begin recording

% FEMA appeal for The Town of Harpswell, Cumberland county, Maine
% TRANSECT ID: CM-127
% calculation by SJH, Ransom Consulting, Inc. 20-Feb-2020
% 100-year wave runup using TAW methodology
% including berm and weighted average with foreshore if necessary
%
% chk nld 20200220
%
% This script assumes that the incident wave conditions provided
% as input in the configuration section below are the
% appropriate values located at the end of the foreshore
% or toe of the slope on which the run-up is being calculated
% the script does not attempt to apply a depth limit or any other
% transformation to the incident wave conditions other than
% conversion of the peak wave period to the spectral mean wave
% as recommended in the references below
%
% references:
%
% Van der Meer, J.W., 2002. Technical Report Wave Run-up and
% Wave Overtopping at Dikes. TAW Technical Advisory Committee on
% Flood Defence, The Netherlands.
%
% FEMA. 2007, Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update
%
%
%-----
% CONFIG
%-----
fname='inpfiles/CM-127sta_ele_include.csv'; % file with station, elevation, include
                                         % third column is 0 for excluded points
imgname='logfiles/CM-127-runup';
SWEL=8.8651; % 100-yr still water level including wave setup.
H0=6.5053; % significant wave height at toe of structure
Tp=9.8292; % peak period, 1/fma,
T0=Tp/1.1;

gamma_berm=0.83689; % this may get changed automatically below
gamma_rough=0.8;
gamma_beta=1;
gamma_perm=1;

setupAtToe=-0.037592;
maxSetup=0.81296; % only used in case of berm/shallow foreshore weighted average

plotTitle='Iterative TAW for CM-127'

plotTitle =

Iterative TAW for CM-127

% END CONFIG
%-----

SWEL=SWEL+setupAtToe

SWEL =

8.827508

SWEL_fore=SWEL+maxSetup

SWEL_fore =

9.640468

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

L0 =

408.556460652322

% 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

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% 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 =

    -0.9304420000000001

% 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 =

    18.585458

% 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 =

    -9.45764232317425

top_sta =

    149.805595413595

% 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

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

top_sta =

    149.805595413595

toe_sta

toe_sta =

    -9.45764232317425

% 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')

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    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 136.1 ft landward of toe of slope

ans =

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

ans =

-!!!-      setup is adjusted to 0.22 feet

ans =

-!!!-      SWEL is adjusted to 9.08 feet

k =

    1
    2
    3
    4
    5
    6
    7
    8
    9
   10
   11
   12
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   43
   44

% 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=[];

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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)

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Irb=(slope/(sqrt(H0/L0)))
% runup height
gamma_berm
gamma_perm
gamma_beta
gamma_rough
gamma=gamma_berm*gamma_perm*gamma_beta*gamma_rough

% check validity
TAW_VALID=1;
if (Irb*gamma_berm < 0.5 | Irb*gamma_berm > 10 )
    sprintf('!!! - - Iribaren number: %6.2f is outside the valid range (0.5-10), TAW NOT VALID - - !!!\n', Irb*gamma_berm)
    TAW_VALID=0;
else
    sprintf('!!! - - Iribaren 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')
    % 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 = -0.930442000000001
toe_sta = -9.45764232317425
top_sta = 149.805595413595
Z2 = 18.585458
H0 = 6.5053
Tp = 9.8292
T0 = 8.93563636363636
R2 = 19.5159
Z2 = 28.5967779401772
top_sta = 361.346131168404
Lslope = 370.803773491578
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 3
dh = 9.44047794017723
rdh_sum = 0.825438151688443
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 4
dh = 9.38707794017723
rdh_sum = 1.64595486277061
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 17
dh = 7.99657794017723
rdh_sum = 2.32213336207064
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 18
dh = 7.94017794017723
rdh_sum = 2.99192314833066
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 19
dh = 7.88545294017723
rdh_sum = 3.65548384530095
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 20
dh = 7.83240294017723
rdh_sum = 4.31297883818023
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 21
dh = 7.78595294017723
rdh_sum = 4.96514151294615
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 22
dh = 7.74610294017723
rdh_sum = 5.61271424888236
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 23
dh = 7.72220294017723
rdh_sum = 6.25752759133528
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 24
dh = 7.71425294017723
rdh_sum = 6.90142198673567
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 25
dh = 7.69510294017723
rdh_sum = 7.54310064739652
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 26
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dh =
7.66475294017723
rdh_sum =
8.18126150062113
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 31
dh =
7.33335294017723
rdh_sum =
8.78056850432131
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 32
dh =
7.27870294017723
rdh_sum =
9.37340049557242
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 33
dh =
7.24027794017723
rdh_sum =
9.96167009073367
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 34
dh =
7.21807794017723
rdh_sum =
10.5473002782499
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 41
dh =
6.40175294017723
rdh_sum =
11.0347994799675
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 42
dh =
6.34290294017723
rdh_sum =
11.5151973290393
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 45
dh =
6.14475294017723
rdh_sum =
11.9717220878773
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 46
dh =
6.08190294017723
rdh_sum =
12.4206928792001
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 53
dh =
5.33000294017723
rdh_sum =
12.7806933545553
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 54
dh =
5.29545294017723
rdh_sum =
13.1366943100205
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 55
dh =
5.24855294017723
rdh_sum =
13.4872821942789
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 56
dh =
5.18930294017723
rdh_sum =
13.8310590851163
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 57
dh =
5.14900294017723
rdh_sum =
14.1702215370752
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 58
dh =
5.12765294017723
rdh_sum =
14.5069455107336
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 73
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dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.1462325755941
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.2559582483991
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.3660476937943
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    15.4775670944337
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    15.5986748381405
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    15.7226090055733
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    15.8488209676365
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    15.9767485433809
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    16.1070078501464
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 118
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dh =
    -4.64202205982277
rdh_sum =
    16.2402288320947
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    16.376715817469
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    16.5167812632805
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    16.8310680619736
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    17.148565182543
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    17.4671006016458
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    17.78449656466
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    18.1008121798042
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    18.4161064019807
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    18.7329948342644
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    19.0541036284047
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    19.6794668731463
ans =
Berm Factor Calculation: Iteration 1, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    20.3079402887076
ans =
!----- End Berm Factor Calculation, Iter: 1 -----!
berm_width =
    54
rB =
    0.145629585943862
rdh_mean =
    0.3760729683094
gamma_berm =
    0.909137764715715
slope =
    0.0932034982246263
Irb =
    0.738625997842251

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gamma_berm =
0.909137764715715
gamma_perm =
1
gamma_beta =
1
gamma_rough =
0.8
gamma =
0.727310211772572
ans =
!!! - - Iribaren number: 0.67 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:10.7 V:H is outside the valid range (1:8 - 1:1), TAW NOT VALID - - !!!
R2_new =
6.18564327581155
R2del =
13.3302567241884
Z2 =
15.2665212159888
top_sta =
124.812820975708
ans =
!----- STARTING ITERATION 2 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
124.812820975708
Z2 =
15.2665212159888
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
6.18564327581155
Z2 =
15.2665212159888
top_sta =
124.812820975708
Lslope =
134.270463298882
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
1
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
2
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
3
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
4
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
5
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
6
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 21
dh =
7.78595294017723
rdh_sum =
7
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 22

```

```
dh =
    7.74610294017723
rdh_sum =
    8
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    9
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    10
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    11
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    12
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    13
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    14
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    15
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    16
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    17
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    18
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    18.4565247588379
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    18.9054955501608
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    19.265496025516
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    19.6214969809812
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 55
```

```
dh =
    5.24855294017723
rdh_sum =
    19.9720848652396
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    20.3158617560769
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    20.6550242080359
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    20.9917481816943
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    21.0825455443531
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    21.1719532426698
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    21.2607658761737
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    21.3497709355901
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    21.4370185661772
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    21.5206117745003
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    22.2890301479243
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    23.054474578732
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    23.8214720463875
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    24.5945178744379
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    25.4058211634087
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 114
```

```

dh =
    -4.46964705982277
rdh_sum =
    26.2276493926574
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    27.0577141563349
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    27.8938390301499
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    28.7380039310993
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    29.5920571767312
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    30.4565987118181
ans =
Berm Factor Calculation: Iteration 2, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    31.3321362762641
ans =
!----- End Berm Factor Calculation, Iter: 2 -----!
berm_width =
    44
rB =
    0.327696791378885
rdh_mean =
    0.71209400627873
gamma_berm =
    0.90565412963879
slope =
    0.17942705314762
Irb =
    1.42193682313995
gamma_berm =
    0.90565412963879
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.724523303711032
ans =
!!! - - Iribaren number: 1.29 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.6 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.8624188802036
R2del =
    5.67677560439208
Z2 =
    20.9432968203809
ans =
!----- STARTING ITERATION 3 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    169.76963255021
Z2 =
    20.9432968203809
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636

```

```
R2 =
    11.8624188802036
Z2 =
    20.9432968203809
top_sta =
    169.76963255021
Lslope =
    179.227274873384
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 32
dh =
    7.27870294017723
```

```
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 75
dh =
    2.50647794017723
```

```
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3155345291782
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.5936150187626
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.8725532356446
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.1548588962555
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.459571029915
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.7708303244617
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.0873467359115
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.4078114329187
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.7336267164816
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.0662121215204
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.4062295384534
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 120
dh =
    -4.76582205982277
```



```

rdh_sum =
    18.7543492283314
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.4432358704796
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.137369978627
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    20.8331928803111
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.5271622367467
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.2193696469857
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    22.9099071901045
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.6030493630042
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.303040196009
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.2981204035075
ans =
Berm Factor Calculation: Iteration 3, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.2939131668359
ans =
!----- End Berm Factor Calculation, Iter: 3 -----!
berm_width =
    54
rB =
    0.301293427789651
rdh_mean =
    0.486924317904369
gamma_berm =
    0.845413669025894
slope =
    0.17467232152498
Irb =
    1.38425617320576
gamma_berm =
    0.845413669025894
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.676330935220715
ans =
!!! - - Iribaren number: 1.17 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.7 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!

```

```

R2_new =
    10.7799393422366
R2del =
    1.08247953796703
Z2 =
    19.8608172824138
top_sta =
    153.591839558156
ans =
!----- STARTING ITERATION 4 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    153.591839558156
Z2 =
    19.8608172824138
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    10.7799393422366
Z2 =
    19.8608172824138
top_sta =
    153.591839558156
Lslope =
    163.049481881331
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 24
dh =
    7.71425294017723

```

```
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 57
dh =
    5.14900294017723
```

```
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3670458773957
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6963843162342
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    16.0267126968149
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.3609258373212
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.7209151741386
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    17.0884121060058
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.4619292731135
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 116
dh =
    -4.54442205982277
```

```

rdh_sum =
    17.8399630847931
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.2241111195512
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.615984547484
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    19.0163243926049
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.4258769763084
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    20.2015695400962
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.9824554556807
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.7650086766383
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.5457318298934
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    23.3247131299112
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    24.1020416192087
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.8819472909924
ans =
Berm Factor Calculation: Iteration 4, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.6686067923263
ans =
!----- End Berm Factor Calculation, Iter: 4 -----!
berm_width =
    52
rB =
    0.318921589937012
rdh_mean =
    0.493627053698583
gamma_berm =
    0.838506734864463
slope =
    0.187225180434716
Irb =
    1.48373600083659
gamma_berm =
    0.838506734864463

```

```

gamma_perm =
1
gamma_beta =
1
gamma_rough =
0.8
gamma =
0.67080538789157
ans =
!!! - - Iribaren number: 1.24 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.460241573081
R2del =
0.680302230844443
Z2 =
20.5411195132583
ans =
!----- STARTING ITERATION 5 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
159.702616101584
Z2 =
20.5411195132583
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
11.460241573081
Z2 =
20.5411195132583
top_sta =
159.702616101584
Lslope =
169.160258424758
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
0.825438151688443
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
1.64595486277061
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
2.32213336207064
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
2.99192314833066
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
3.65548384530095
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
4.31297883818023
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 21
dh =
7.78595294017723
rdh_sum =
4.96514151294615
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 22
dh =
7.74610294017723
rdh_sum =
5.61271424888236

```

```
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 23  
dh =  
    7.72220294017723  
rdh_sum =  
    6.25752759133528  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 24  
dh =  
    7.71425294017723  
rdh_sum =  
    6.90142198673567  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 25  
dh =  
    7.69510294017723  
rdh_sum =  
    7.54310064739652  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 26  
dh =  
    7.66475294017723  
rdh_sum =  
    8.18126150062113  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 31  
dh =  
    7.33335294017723  
rdh_sum =  
    8.78056850432131  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 32  
dh =  
    7.27870294017723  
rdh_sum =  
    9.37340049557242  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789
```

```
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 76  
dh =  
    2.50927794017723  
rdh_sum =  
    14.8649682646294  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 77  
dh =  
    2.48360294017723  
rdh_sum =  
    14.9522158952165  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 78  
dh =  
    2.42945294017723  
rdh_sum =  
    15.0358091035397  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 107  
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3332556193151  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.6289679991326  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 109  
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9255846436153  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.2257509016191  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.5495136665508  
ans =  
Berm Factor Calculation: Iteration 5, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.8801639310132
```



```
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.2163421239624
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5566705333358
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.9026211654577
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.2556822679911
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.6165446410581
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9859065709968
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.7061358348019
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.431628722443
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.1588143142481
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.884142034815
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.6077029926143
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.3295888895247
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.0540872504826
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.785447695085
ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.7851401448986
```

```

ans =
Berm Factor Calculation: Iteration 5, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.7849946535581
ans =
!----- End Berm Factor Calculation, Iter: 5 -----!
berm_width =
    54
rB =
    0.319223915255598
rdh_mean =
    0.496018419510335
gamma_berm =
    0.839117026659385
slope =
    0.18644940370021
Irb =
    1.47758806781324
gamma_berm =
    0.839117026659385
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.671293621327508
ans =
!!! - - Iribaren number: 1.24 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.4 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.4210620644284
R2del =
    0.0391795086526443
Z2 =
    20.5019400046056
ans =
!----- STARTING ITERATION 6 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    158.721902493257
Z2 =
    20.5019400046056
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.4210620644284
Z2 =
    20.5019400046056
top_sta =
    158.721902493257
Lslope =
    168.179544816431
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 19

```

```
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 46
```

```
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3350664140048
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6325805911305
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 109
```

```
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9310037272582  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.232994848103  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.5587022928219  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.8913314379112  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.2295157032165  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.5718704472138  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    17.9198746522327  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.2750234252914  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.6380104224463  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 120  
dh =  
    -4.76582205982277  
rdh_sum =  
    19.0095366854678  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 143  
dh =  
    -7.39397205982277  
rdh_sum =  
    19.7328818072899  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 144  
dh =  
    -7.43687205982277  
rdh_sum =  
    20.461490141789  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 145  
dh =  
    -7.45072205982277  
rdh_sum =  
    21.1917909095429  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 146  
dh =  
    -7.43552205982277  
rdh_sum =  
    21.9202340997579  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 147  
dh =  
    -7.42109705982277  
rdh_sum =  
    22.6469107306933  
ans =  
Berm Factor Calculation: Iteration 6, Profile Segment: 148
```

```

dh =
    -7.40744705982277
rdh_sum =
    23.3719124259974
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.0995263612888
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.8340010199059
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.8338519525977
ans =
Berm Factor Calculation: Iteration 6, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.8338068607725
ans =
!----- End Berm Factor Calculation, Iter: 6 -----!
berm_width =
    54
rB =
    0.32108542129152
rdh_mean =
    0.496922349273565
gamma_berm =
    0.838469100574154
slope =
    0.187707719793969
Irb =
    1.48756006455218
gamma_berm =
    0.838469100574154
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.670775280459323
ans =
!!! - - Iribaren number: 1.25 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.4892626023798
R2del =
    0.0682005379514177
Z2 =
    20.570140542557
ans =
!----- STARTING ITERATION 7 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    160.429049876272
Z2 =
    20.570140542557
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.4892626023798
Z2 =
    20.570140542557
top_sta =
    160.429049876272
Lslope =
    169.886692199446
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 3
dh =
    9.44047794017723

```

```
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 34
dh =
    7.21807794017723
```

```
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 77
dh =
    2.48360294017723
```



```
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.331924316717
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6263120228535
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9216005350794
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2204251251883
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5427579193963
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.8719529998236
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.2066559599377
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5454941952474
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.8899345657982
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.2414602569257
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.6007599573662
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9685299147591
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.6864580868926
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 144
dh =
    -7.43687205982277
```

```

rdh_sum =
    20.4096499417306
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.1345346207733
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.8575612994805
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.5788211479229
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.2984059208161
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.0206032015489
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.7496632436369
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.7492027216383
ans =
Berm Factor Calculation: Iteration 7, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.7489467588782
ans =
!----- End Berm Factor Calculation, Iter: 7 -----!
berm_width =
    54
rB =
    0.317858917028088
rdh_mean =
    0.495350865905153
gamma_berm =
    0.839592772757449
slope =
    0.185531074660011
Irb =
    1.47031042570124
gamma_berm =
    0.839592772757449
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.67167421820596
ans =
!!! - - Iribaren number: 1.23 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.4 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.3712527040836
R2del =
    0.118009898296215
Z2 =
    20.4521306442608
top_sta =
    157.475109994013
ans =
!----- STARTING ITERATION 8 -----!
Ztoe =
    -0.930442000000001

```

```
toe_sta =  
-9.45764232317425  
top_sta =  
157.475109994013  
Z2 =  
20.4521306442608  
H0 =  
6.5053  
Tp =  
9.8292  
T0 =  
8.93563636363636  
R2 =  
11.3712527040836  
Z2 =  
20.4521306442608  
top_sta =  
157.475109994013  
Lslope =  
166.932752317187  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 3  
dh =  
9.44047794017723  
rdh_sum =  
0.825438151688443  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 4  
dh =  
9.38707794017723  
rdh_sum =  
1.64595486277061  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 17  
dh =  
7.99657794017723  
rdh_sum =  
2.32213336207064  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 18  
dh =  
7.94017794017723  
rdh_sum =  
2.99192314833066  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 19  
dh =  
7.88545294017723  
rdh_sum =  
3.65548384530095  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 20  
dh =  
7.83240294017723  
rdh_sum =  
4.31297883818023  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 21  
dh =  
7.78595294017723  
rdh_sum =  
4.96514151294615  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 22  
dh =  
7.74610294017723  
rdh_sum =  
5.61271424888236  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 23  
dh =  
7.72220294017723  
rdh_sum =  
6.25752759133528  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 24  
dh =  
7.71425294017723  
rdh_sum =  
6.90142198673567  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 25  
dh =  
7.69510294017723  
rdh_sum =  
7.54310064739652  
ans =  
Berm Factor Calculation: Iteration 8, Profile Segment: 26  
dh =  
7.66475294017723
```

```
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 73
dh =
    2.53522794017723
```

```
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3373911051265
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6372184548742
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9379607734028
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2422945944932
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5704980689547
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9056669922475
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.2464258122062
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5913810212775
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.9420205172376
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 118
dh =
    -4.64202205982277
```

```

rdh_sum =
    18.2998481686285
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.665561271006
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.0398643738467
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.7671859201133
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.4997695921599
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.2340451679367
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.9664637426389
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.6971162078693
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.4260940761047
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.1576836189264
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.8961313983067
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.8961024266641
ans =
Berm Factor Calculation: Iteration 8, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.8961024081597
ans =
!----- End Berm Factor Calculation, Iter: 8 -----!
berm_width =
    54
rB =
    0.323483554008593
rdh_mean =
    0.498075970521475
gamma_berm =
    0.837635831101973
slope =
    0.189338984533069
Irb =
    1.50048763238615
gamma_berm =
    0.837635831101973

```

```

gamma_perm =
1
gamma_beta =
1
gamma_rough =
0.8
gamma =
0.670108664881578
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.5775922344067
R2del =
0.206339530323083
Z2 =
20.6584701745839
ans =
!----- STARTING ITERATION 9 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
162.640054432639
Z2 =
20.6584701745839
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
11.5775922344067
Z2 =
20.6584701745839
top_sta =
162.640054432639
Lslope =
172.097696755813
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
0.825438151688443
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
1.64595486277061
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
2.32213336207064
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
2.99192314833066
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
3.65548384530095
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
4.31297883818023
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 21
dh =
7.78595294017723
rdh_sum =
4.96514151294615
ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 22
dh =
7.74610294017723
rdh_sum =
5.61271424888236

```

```
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 23  
dh =  
    7.72220294017723  
rdh_sum =  
    6.25752759133528  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 24  
dh =  
    7.71425294017723  
rdh_sum =  
    6.90142198673567  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 25  
dh =  
    7.69510294017723  
rdh_sum =  
    7.54310064739652  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 26  
dh =  
    7.66475294017723  
rdh_sum =  
    8.18126150062113  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 31  
dh =  
    7.33335294017723  
rdh_sum =  
    8.78056850432131  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 32  
dh =  
    7.27870294017723  
rdh_sum =  
    9.37340049557242  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789
```



```
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 76  
dh =  
    2.50927794017723  
rdh_sum =  
    14.8649682646294  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 77  
dh =  
    2.48360294017723  
rdh_sum =  
    14.9522158952165  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 78  
dh =  
    2.42945294017723  
rdh_sum =  
    15.0358091035397  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 107  
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3279238912468  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.6183311622572  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 109  
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9096288097176  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.2044217142711  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.5224564004983  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.8472772604736
```

```
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.1775454643075  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.5119038212868  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    17.8518036385443  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.1987127915594  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.553313565145  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 120  
dh =  
    -4.76582205982277  
rdh_sum =  
    18.9162960153111  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 143  
dh =  
    -7.39397205982277  
rdh_sum =  
    19.6272571917296  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 144  
dh =  
    -7.43687205982277  
rdh_sum =  
    20.3434809854905  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 145  
dh =  
    -7.45072205982277  
rdh_sum =  
    21.0613975602945  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 146  
dh =  
    -7.43552205982277  
rdh_sum =  
    21.7774561900044  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 147  
dh =  
    -7.42109705982277  
rdh_sum =  
    22.491748205668  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 148  
dh =  
    -7.40744705982277  
rdh_sum =  
    23.2043654968813  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 149  
dh =  
    -7.42874705982277  
rdh_sum =  
    23.9195948103295  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 150  
dh =  
    -7.48499705982277  
rdh_sum =  
    24.6416872760808  
ans =  
Berm Factor Calculation: Iteration 9, Profile Segment: 163  
dh =  
    -11.3322970598228  
rdh_sum =  
    25.6405800028538
```

```

ans =
Berm Factor Calculation: Iteration 9, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.639803933544
ans =
!----- End Berm Factor Calculation, Iter: 9 -----!
berm_width =
    54
rB =
    0.3137752626441
rdh_mean =
    0.493329702473036
gamma_berm =
    0.841019394319513
slope =
    0.182805531078414
Irb =
    1.44871083570767
gamma_berm =
    0.841019394319513
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.67281551545561
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.223241346488
R2del =
    0.354350887918635
Z2 =
    20.3041192866653
top_sta =
    155.548043057662
ans =
!----- STARTING ITERATION 10 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.548043057662
Z2 =
    20.3041192866653
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.223241346488
Z2 =
    20.3041192866653
top_sta =
    155.548043057662
Lslope =
    165.005685380837
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066

```

```
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 19  
dh =  
    7.88545294017723  
rdh_sum =  
    3.65548384530095  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 20  
dh =  
    7.83240294017723  
rdh_sum =  
    4.31297883818023  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 21  
dh =  
    7.78595294017723  
rdh_sum =  
    4.96514151294615  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 22  
dh =  
    7.74610294017723  
rdh_sum =  
    5.61271424888236  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 23  
dh =  
    7.72220294017723  
rdh_sum =  
    6.25752759133528  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 24  
dh =  
    7.71425294017723  
rdh_sum =  
    6.90142198673567  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 25  
dh =  
    7.69510294017723  
rdh_sum =  
    7.54310064739652  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 26  
dh =  
    7.66475294017723  
rdh_sum =  
    8.18126150062113  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 31  
dh =  
    7.33335294017723  
rdh_sum =  
    8.78056850432131  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 32  
dh =  
    7.27870294017723  
rdh_sum =  
    9.37340049557242  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773
```

```
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 76  
dh =  
    2.50927794017723  
rdh_sum =  
    14.8649682646294  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 77  
dh =  
    2.48360294017723  
rdh_sum =  
    14.9522158952165  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 78  
dh =  
    2.42945294017723  
rdh_sum =  
    15.0358091035397  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 107  
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3444516122057  
ans =  
Berm Factor Calculation: Iteration 10, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.651304709407
```

```
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9590909116611
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2705395793764
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.6063201836077
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9491980097711
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.2977704382731
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6506172418258
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.0092531164873
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.3752082327618
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.7491907534065
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.13191567569
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8711506093915
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.6156405198205
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.3618194749892
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.1061445523307
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8487061842152
```

```

ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5895954716198
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.3330928046294
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0834357261181
ans =
Berm Factor Calculation: Iteration 10, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0832028150996
ans =
!----- End Berm Factor Calculation, Iter: 10 -----!
berm_width =
    53
rB =
    0.321201053634454
rdh_mean =
    0.49213590217169
gamma_berm =
    0.836873516674435
slope =
    0.189584673442821
Irb =
    1.50243468608672
gamma_berm =
    0.836873516674435
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.669498813339548
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.5820652886969
R2del =
    0.358823942208806
Z2 =
    20.6629432288741
ans =
!----- STARTING ITERATION 11 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    162.752020747787
Z2 =
    20.6629432288741
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.5820652886969
Z2 =
    20.6629432288741
top_sta =
    162.752020747787
Lslope =
    172.209663070961
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 4

```

```
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 41
```



```
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 78
```

```
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3277233511795
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.617931087033
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9090286750462
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2036194680076
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5214386443814
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.846040165262
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.1760859838887
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5102196848373
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.849891792077
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.1965694097454
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.550934499287
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9136768037443
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.6242866572225
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.3401590255371
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 145
```

```

dh =
    -7.45072205982277
rdh_sum =
    21.0577241567673
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.7734313631895
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4873719829674
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.1996379115136
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9145158135569
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.6362568224582
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6351097013295
ans =
Berm Factor Calculation: Iteration 11, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.634300089778
ans =
!----- End Berm Factor Calculation, Iter: 11 -----!
berm_width =
    54
rB =
    0.313571253999542
rdh_mean =
    0.493227779440333
gamma_berm =
    0.841090799306973
slope =
    0.182670220588579
Irb =
    1.44763851709863
gamma_berm =
    0.841090799306973
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672872639445578
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.2158862165661
R2del =
    0.366179072130757
Z2 =
    20.2967641567433
top_sta =
    155.510726315288
ans =
!----- STARTING ITERATION 12 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.510726315288

```

```
Z2 =
    20.2967641567433
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.2158862165661
Z2 =
    20.2967641567433
top_sta =
    155.510726315288
Lslope =
    164.968368638463
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 31
```

```
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 74
```

```
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3448085347306
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6520168062965
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9601590950572
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.271967417906
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.6081309097404
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9513982407548
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.3003654303654
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6536109089052
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.0126507159133
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.3790163391291
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 119
```

```

dh =
    -4.70142205982277
rdh_sum =
    18.7534164831795
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.1365666652346
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8763972898172
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.6214823761818
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.368256312855
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.1131765843464
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8563335968394
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5978184275641
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.3419110441567
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0928484065504
ans =
Berm Factor Calculation: Iteration 12, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0925826710735
ans =
!----- End Berm Factor Calculation, Iter: 12 -----!
berm_width =
    53
rB =
    0.321273711060043
rdh_mean =
    0.492312880586293
gamma_berm =
    0.836893475088575
slope =
    0.189582168739855
Irb =
    1.50241483663083
gamma_berm =
    0.836893475088575
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.66951478007086
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!

```

```

ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.5821884864346
R2del =
0.366302269868545
Z2 =
20.6630664266119
ans =
!----- STARTING ITERATION 13 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
162.755104545979
Z2 =
20.6630664266119
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
11.5821884864346
Z2 =
20.6630664266119
top_sta =
162.755104545979
Lslope =
172.212746869154
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
0.825438151688443
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
1.64595486277061
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
2.32213336207064
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
2.99192314833066
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
3.65548384530095
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
4.31297883818023
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 21
dh =
7.78595294017723
rdh_sum =
4.96514151294615
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 22
dh =
7.74610294017723
rdh_sum =
5.61271424888236
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 23
dh =
7.72220294017723
rdh_sum =
6.25752759133528
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 24
dh =
7.71425294017723

```



```
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 57
dh =
    5.14900294017723
```

```
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3277178306299
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6179200736012
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9090121542973
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2035973834414
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5214106271078
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.8460061098496
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.1760458064673
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 116
dh =
    -4.54442205982277
```

```

rdh_sum =
    17.5101733228828
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.8498391615013
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.1965104052214
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.5508690065827
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9136047000085
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.6242048793318
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.3400675706032
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.0576230242697
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.7733205537102
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4872514972832
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.19950775056
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9143759759593
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.6361073068777
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349590787338
ans =
Berm Factor Calculation: Iteration 13, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.6341485336929
ans =
!----- End Berm Factor Calculation, Iter: 13 -----!
berm_width =
54

```

```

rB =
    0.313565638907258
rdh_mean =
    0.493224972846165
gamma_berm =
    0.841092764828265
slope =
    0.182666497467596
Irb =
    1.44760901183324
gamma_berm =
    0.841092764828265
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672874211862612
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.2156838278222
R2del =
    0.366504658612428
Z2 =
    20.2965617679994
top_sta =
    155.509699482493
ans =
!----- STARTING ITERATION 14 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.509699482493
Z2 =
    20.2965617679994
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.2156838278222
Z2 =
    20.2965617679994
top_sta =
    155.509699482493
Lslope =
    164.967341805668
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 20
dh =
    7.83240294017723

```

```
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 53
dh =
    5.33000294017723
```

```
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3448183642845
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6520364172727
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9601885125694
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 110
dh =
    -4.23027205982277
```

```
rdh_sum =
    16.2720067402078
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.6081807764609
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9514588340708
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.3004368949825
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6536933525718
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.0127442833614
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.3791212113502
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.7535328560777
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.1366947490208
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8765417698377
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.6216432380463
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.368433551141
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.1133702049846
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8565436050353
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5980448278651
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 149
dh =
    -7.42874705982277
```

```

rdh_sum =
    24.342153829306
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0931075530643
ans =
Berm Factor Calculation: Iteration 14, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0928408831662
ans =
!----- End Berm Factor Calculation, Iter: 14 -----!
berm_width =
    53
rB =
    0.321275710815746
rdh_mean =
    0.49231775251257
gamma_berm =
    0.83689402506994
slope =
    0.189582099795147
Irb =
    1.50241429025269
gamma_berm =
    0.83689402506994
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.669515220055952
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.5821918858444
R2del =
    0.366508058022148
Z2 =
    20.6630698260216
ans =
!----- STARTING ITERATION 15 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    162.755189637587
Z2 =
    20.6630698260216
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.5821918858444
Z2 =
    20.6630698260216
top_sta =
    162.755189637587
Lslope =
    172.212831960761
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064

```



```
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 18  
dh =  
    7.94017794017723  
rdh_sum =  
    2.99192314833066  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 19  
dh =  
    7.88545294017723  
rdh_sum =  
    3.65548384530095  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 20  
dh =  
    7.83240294017723  
rdh_sum =  
    4.31297883818023  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 21  
dh =  
    7.78595294017723  
rdh_sum =  
    4.96514151294615  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 22  
dh =  
    7.74610294017723  
rdh_sum =  
    5.61271424888236  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 23  
dh =  
    7.72220294017723  
rdh_sum =  
    6.25752759133528  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 24  
dh =  
    7.71425294017723  
rdh_sum =  
    6.90142198673567  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 25  
dh =  
    7.69510294017723  
rdh_sum =  
    7.54310064739652  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 26  
dh =  
    7.66475294017723  
rdh_sum =  
    8.18126150062113  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 31  
dh =  
    7.33335294017723  
rdh_sum =  
    8.78056850432131  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 32  
dh =  
    7.27870294017723  
rdh_sum =  
    9.37340049557242  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393
```

```
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 76  
dh =  
    2.50927794017723  
rdh_sum =  
    14.8649682646294  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 77  
dh =  
    2.48360294017723  
rdh_sum =  
    14.9522158952165  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 78  
dh =  
    2.42945294017723  
rdh_sum =  
    15.0358091035397  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 107  
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3277176783028
```

```
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.6179197697105  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 109  
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9090116984446  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.2035967740678  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.5214098540345  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.8460051701674  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.1760446978621  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.5101720436292  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    17.8498377092793  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.1965087771245  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.5508671994591  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 120  
dh =  
    -4.76582205982277  
rdh_sum =  
    18.9136027104683  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 143  
dh =  
    -7.39397205982277  
rdh_sum =  
    19.624202622853  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 144  
dh =  
    -7.43687205982277  
rdh_sum =  
    20.3400650471061  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 145  
dh =  
    -7.45072205982277  
rdh_sum =  
    21.05762023374  
ans =  
Berm Factor Calculation: Iteration 15, Profile Segment: 146  
dh =  
    -7.43552205982277  
rdh_sum =  
    21.7733174961639
```

```

ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4872481727417
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.1995041590492
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9143721174413
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.6361031813154
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349549226183
ans =
Berm Factor Calculation: Iteration 15, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.6341443518122
ans =
!----- End Berm Factor Calculation, Iter: 15 -----!
berm_width =
    54
rB =
    0.313565483972204
rdh_mean =
    0.493224895403929
gamma_berm =
    0.841092819062269
slope =
    0.182666394737834
Irb =
    1.44760819771279
gamma_berm =
    0.841092819062269
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672874255249815
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.2156782434282
R2del =
    0.366513642416136
Z2 =
    20.2965561836055
top_sta =
    155.509671149698
ans =
!----- STARTING ITERATION 16 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.509671149698
Z2 =
    20.2965561836055
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.2156782434282

```

```
Z2 =
    20.2965561836055
top_sta =
    155.509671149698
Lslope =
    164.967313472872
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
```

```
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091  
ans =  
Berm Factor Calculation: Iteration 16, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213
```

```
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3448186355119
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6520369583994
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9601893242883
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.27200782523
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.6081821524356
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9514605060248
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.3004388669087
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6536956274432
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.0127468651715
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.3791241050931
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.753536067159
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.1366982832407
```

```

ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8765457564729
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.6216476766996
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.3684384416627
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.1133755475384
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8565493997649
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5980510748961
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.342160528438
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0931147036491
ans =
Berm Factor Calculation: Iteration 16, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0928480079444
ans =
!----- End Berm Factor Calculation, Iter: 16 -----!
berm_width =
    53
rB =
    0.321275765994186
rdh_mean =
    0.492317886942346
gamma_berm =
    0.836894040245855
slope =
    0.189582097892778
Irb =
    1.50241427517666
gamma_berm =
    0.836894040245855
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.669515232196684
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.5821919796494
R2del =
    0.366513736221201
Z2 =
    20.6630699198267
ans =
!----- STARTING ITERATION 17 -----!

```



```
Ztoe = -0.930442000000001
toe_sta = -9.45764232317425
top_sta = 162.755191985649
Z2 = 20.6630699198267
H0 = 6.5053
Tp = 9.8292
T0 = 8.93563636363636
R2 = 11.5821919796494
Z2 = 20.6630699198267
top_sta = 162.755191985649
Lslope = 172.212834308823
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 3
dh = 9.44047794017723
rdh_sum = 0.825438151688443
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 4
dh = 9.38707794017723
rdh_sum = 1.64595486277061
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 17
dh = 7.99657794017723
rdh_sum = 2.32213336207064
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 18
dh = 7.94017794017723
rdh_sum = 2.99192314833066
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 19
dh = 7.88545294017723
rdh_sum = 3.65548384530095
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 20
dh = 7.83240294017723
rdh_sum = 4.31297883818023
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 21
dh = 7.78595294017723
rdh_sum = 4.96514151294615
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 22
dh = 7.74610294017723
rdh_sum = 5.61271424888236
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 23
dh = 7.72220294017723
rdh_sum = 6.25752759133528
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 24
dh = 7.71425294017723
rdh_sum = 6.90142198673567
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 25
dh = 7.69510294017723
rdh_sum = 7.54310064739652
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 26
```

```
dh =
7.66475294017723
rdh_sum =
8.18126150062113
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 31
dh =
7.33335294017723
rdh_sum =
8.78056850432131
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 32
dh =
7.27870294017723
rdh_sum =
9.37340049557242
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 33
dh =
7.24027794017723
rdh_sum =
9.96167009073367
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 34
dh =
7.21807794017723
rdh_sum =
10.5473002782499
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 41
dh =
6.40175294017723
rdh_sum =
11.0347994799675
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 42
dh =
6.34290294017723
rdh_sum =
11.5151973290393
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 45
dh =
6.14475294017723
rdh_sum =
11.9717220878773
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 46
dh =
6.08190294017723
rdh_sum =
12.4206928792001
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 53
dh =
5.33000294017723
rdh_sum =
12.7806933545553
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 54
dh =
5.29545294017723
rdh_sum =
13.1366943100205
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 55
dh =
5.24855294017723
rdh_sum =
13.4872821942789
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 56
dh =
5.18930294017723
rdh_sum =
13.8310590851163
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 57
dh =
5.14900294017723
rdh_sum =
14.1702215370752
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 58
dh =
5.12765294017723
rdh_sum =
14.5069455107336
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 73
```

```
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3277176740994
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6179197613247
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9090116858656
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2035967572524
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5214098327019
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.8460051442373
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.1760446672706
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5101720083289
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.8498376692059
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 118
```

```

dh =
    -4.64202205982277
rdh_sum =
    18.196508732198
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.5508671495924
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9136026555679
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.6242025605866
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.3400649774714
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.0576201567367
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.7733174117925
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4872480810026
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.1995040599432
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9143720109674
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.6361030674726
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349548079324
ans =
Berm Factor Calculation: Iteration 17, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.6341442364152
ans =
!----- End Berm Factor Calculation, Iter: 17 -----!
berm_width =
    54
rB =
    0.313565479696849
rdh_mean =
    0.493224893266948
gamma_berm =
    0.841092820558829
slope =
    0.182666391903057
Irb =
    1.44760817524755

```

```

gamma_berm =
0.841092820558829
gamma_perm =
1
gamma_beta =
1
gamma_rough =
0.8
gamma =
0.672874256447063
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.2156780893297
R2del =
0.366513890319741
Z2 =
20.2965560295069
top_sta =
155.509670367869
ans =
!----- STARTING ITERATION 18 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
155.509670367869
Z2 =
20.2965560295069
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
11.2156780893297
Z2 =
20.2965560295069
top_sta =
155.509670367869
Lslope =
164.967312691043
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
0.825438151688443
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
1.64595486277061
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
2.32213336207064
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
2.99192314833066
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
3.65548384530095
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
4.31297883818023
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 21
dh =
7.78595294017723
rdh_sum =
4.96514151294615
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 22

```

```
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 55
```

```
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3448186429963
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6520369733315
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9601893466873
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2720078551707
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.608182190405
ans =
Berm Factor Calculation: Iteration 18, Profile Segment: 114
```

```
dh =  
    -4.46964705982277  
rdh_sum =  
    16.9514605521616  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.300438921323  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.6536956902171  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    18.0127469364153  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.3791241849445  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.7535361557672  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 120  
dh =  
    -4.76582205982277  
rdh_sum =  
    19.1366983807657  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 143  
dh =  
    -7.39397205982277  
rdh_sum =  
    19.8765458664821  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 144  
dh =  
    -7.43687205982277  
rdh_sum =  
    20.6216477991821  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 145  
dh =  
    -7.45072205982277  
rdh_sum =  
    21.3684385766142  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 146  
dh =  
    -7.43552205982277  
rdh_sum =  
    22.1133756949636  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 147  
dh =  
    -7.42109705982277  
rdh_sum =  
    22.8565495596676  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 148  
dh =  
    -7.40744705982277  
rdh_sum =  
    23.5980512472799  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 149  
dh =  
    -7.42874705982277  
rdh_sum =  
    24.3421607132972  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 150  
dh =  
    -7.48499705982277  
rdh_sum =  
    25.093114900966  
ans =  
Berm Factor Calculation: Iteration 18, Profile Segment: 163
```



```

dh =
    -11.3322970598228
rdh_sum =
    26.0928482045491
ans =
!----- End Berm Factor Calculation, Iter: 18 -----!
berm_width =
    53
rB =
    0.321275767516808
rdh_mean =
    0.492317890651869
gamma_berm =
    0.836894040664627
slope =
    0.189582097840284
Irb =
    1.50241427476064
gamma_berm =
    0.836894040664627
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.669515232531702
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.5821919822379
R2del =
    0.366513892908252
Z2 =
    20.6630699224152
ans =
!----- STARTING ITERATION 19 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    162.755192050442
Z2 =
    20.6630699224152
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.5821919822379
Z2 =
    20.6630699224152
top_sta =
    162.755192050442
Lslope =
    172.212834373617
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 19
dh =
    7.88545294017723

```

```
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 46
dh =
    6.08190294017723
```

```
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3277176739834
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6179197610933
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 109
dh =
    -4.20197205982277
```

```
rdh_sum =
    15.9090116855184
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2035967567884
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5214098321133
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.8460051435218
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.1760446664265
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5101720073548
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.8498376681001
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.1965087309583
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.5508671482163
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9136026540529
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.6242025588684
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.3400649755499
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.0576201546118
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.7733174094643
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4872480784711
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 148
dh =
    -7.40744705982277
```

```

rdh_sum =
    23.1995040572085
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9143720080293
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.6361030643311
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349548047676
ans =
Berm Factor Calculation: Iteration 19, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.6341442332309
ans =
!----- End Berm Factor Calculation, Iter: 19 -----!
berm_width =
    54
rB =
    0.313565479578872
rdh_mean =
    0.493224893207979
gamma_berm =
    0.841092820600126
slope =
    0.182666391824833
Irb =
    1.44760817462763
gamma_berm =
    0.841092820600126
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672874256480101
ans =
!!! - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.2156780850774
R2del =
    0.366513897160534
Z2 =
    20.2965560252546
top_sta =
    155.509670346294
ans =
!----- STARTING ITERATION 20 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.509670346294
Z2 =
    20.2965560252546
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.2156780850774
Z2 =
    20.2965560252546
top_sta =
    155.509670346294
Lslope =
    164.967312669469
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 3
dh =
    9.44047794017723

```

```
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 34
dh =
    7.21807794017723
```

```
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 77
dh =
    2.48360294017723
```

```
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3448186432028
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6520369737435
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9601893473054
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2720078559969
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.6081821914527
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9514605534347
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.3004389228245
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6536956919494
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.0127469383813
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.379124187148
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.7535361582123
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.1366983834569
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8765458695178
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 144
dh =
    -7.43687205982277
```



```

rdh_sum =
    20.6216478025619
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.3684385803381
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.1133756990317
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.85654956408
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5980512520367
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.3421607183983
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0931149064108
ans =
Berm Factor Calculation: Iteration 20, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0928482099743
ans =
!----- End Berm Factor Calculation, Iter: 20 -----!
berm_width =
    53
rB =
    0.321275767558824
rdh_mean =
    0.492317890754232
gamma_berm =
    0.836894040676183
slope =
    0.189582097838835
Irb =
    1.50241427474916
gamma_berm =
    0.836894040676183
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.669515232540947
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.5821919823094
R2del =
    0.366513897231959
Z2 =
    20.6630699224866
ans =
!----- STARTING ITERATION 21 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    162.75519205223
Z2 =
    20.6630699224866
H0 =
    6.5053

```

```

Tp =
          9.8292
T0 =
      8.93563636363636
R2 =
      11.5821919823094
Z2 =
      20.6630699224866
top_sta =
      162.75519205223
Lslope =
      172.212834375405
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 3
dh =
      9.44047794017723
rdh_sum =
      0.825438151688443
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 4
dh =
      9.38707794017723
rdh_sum =
      1.64595486277061
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 17
dh =
      7.99657794017723
rdh_sum =
      2.32213336207064
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 18
dh =
      7.94017794017723
rdh_sum =
      2.99192314833066
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 19
dh =
      7.88545294017723
rdh_sum =
      3.65548384530095
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 20
dh =
      7.83240294017723
rdh_sum =
      4.31297883818023
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 21
dh =
      7.78595294017723
rdh_sum =
      4.96514151294615
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 22
dh =
      7.74610294017723
rdh_sum =
      5.61271424888236
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 23
dh =
      7.72220294017723
rdh_sum =
      6.25752759133528
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 24
dh =
      7.71425294017723
rdh_sum =
      6.90142198673567
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 25
dh =
      7.69510294017723
rdh_sum =
      7.54310064739652
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 26
dh =
      7.66475294017723
rdh_sum =
      8.18126150062113
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 31
dh =
      7.33335294017723
rdh_sum =
      8.78056850432131

```

```
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 32  
dh =  
    7.27870294017723  
rdh_sum =  
    9.37340049557242  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091
```

```
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 76  
dh =  
    2.50927794017723  
rdh_sum =  
    14.8649682646294  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 77  
dh =  
    2.48360294017723  
rdh_sum =  
    14.9522158952165  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 78  
dh =  
    2.42945294017723  
rdh_sum =  
    15.0358091035397  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 107  
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3277176739802  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.617919761087  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 109  
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9090116855089  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.2035967567756  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.521409832097  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.8460051435021  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.1760446664032  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.5101720073279  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    17.8498376680696  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.1965087309241  
ans =  
Berm Factor Calculation: Iteration 21, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.5508671481783
```

```

ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.9136026540111
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.624202558821
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.3400649754969
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.0576201545532
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.7733174094
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4872480784013
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.199504057133
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9143720079482
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.6361030642444
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349548046803
ans =
Berm Factor Calculation: Iteration 21, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.634144233143
ans =
!----- End Berm Factor Calculation, Iter: 21 -----!
berm_width =
    54
rB =
    0.313565479575617
rdh_mean =
    0.493224893206352
gamma_berm =
    0.841092820601265
slope =
    0.182666391822675
Irb =
    1.44760817461053
gamma_berm =
    0.841092820601265
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672874256481012

```

```

ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.2156780849601
R2del =
0.366513897349293
Z2 =
20.2965560251373
top_sta =
155.509670345699
ans =
!----- STARTING ITERATION 22 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
155.509670345699
Z2 =
20.2965560251373
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
11.2156780849601
Z2 =
20.2965560251373
top_sta =
155.509670345699
Lslope =
164.967312668873
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
0.825438151688443
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
1.64595486277061
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
2.32213336207064
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
2.99192314833066
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
3.65548384530095
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
4.31297883818023
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 21
dh =
7.78595294017723
rdh_sum =
4.96514151294615
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 22
dh =
7.74610294017723
rdh_sum =
5.61271424888236
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 23
dh =
7.72220294017723
rdh_sum =
6.25752759133528

```

```
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 24  
dh =  
    7.71425294017723  
rdh_sum =  
    6.90142198673567  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 25  
dh =  
    7.69510294017723  
rdh_sum =  
    7.54310064739652  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 26  
dh =  
    7.66475294017723  
rdh_sum =  
    8.18126150062113  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 31  
dh =  
    7.33335294017723  
rdh_sum =  
    8.78056850432131  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 32  
dh =  
    7.27870294017723  
rdh_sum =  
    9.37340049557242  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 33  
dh =  
    7.24027794017723  
rdh_sum =  
    9.96167009073367  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 34  
dh =  
    7.21807794017723  
rdh_sum =  
    10.5473002782499  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 41  
dh =  
    6.40175294017723  
rdh_sum =  
    11.0347994799675  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 42  
dh =  
    6.34290294017723  
rdh_sum =  
    11.5151973290393  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 45  
dh =  
    6.14475294017723  
rdh_sum =  
    11.9717220878773  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 46  
dh =  
    6.08190294017723  
rdh_sum =  
    12.4206928792001  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 53  
dh =  
    5.33000294017723  
rdh_sum =  
    12.7806933545553  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 54  
dh =  
    5.29545294017723  
rdh_sum =  
    13.1366943100205  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 55  
dh =  
    5.24855294017723  
rdh_sum =  
    13.4872821942789  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 56  
dh =  
    5.18930294017723  
rdh_sum =  
    13.8310590851163
```

```
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 57  
dh =  
    5.14900294017723  
rdh_sum =  
    14.1702215370752  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 58  
dh =  
    5.12765294017723  
rdh_sum =  
    14.5069455107336  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 73  
dh =  
    2.53522794017723  
rdh_sum =  
    14.5977428733925  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 74  
dh =  
    2.51512794017723  
rdh_sum =  
    14.6871505717091  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 75  
dh =  
    2.50647794017723  
rdh_sum =  
    14.775963205213  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 76  
dh =  
    2.50927794017723  
rdh_sum =  
    14.8649682646294  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 77  
dh =  
    2.48360294017723  
rdh_sum =  
    14.9522158952165  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 78  
dh =  
    2.42945294017723  
rdh_sum =  
    15.0358091035397  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 107  
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3448186432085  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.6520369737549  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 109  
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9601893473225  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.2720078560197  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.6081821914816  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.9514605534698  
ans =  
Berm Factor Calculation: Iteration 22, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.300438922866
```



```

ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6536956919972
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    18.0127469384355
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.3791241872088
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.7535361582798
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.1366983835312
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8765458696015
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.6216478026552
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.3684385804409
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.113375699144
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8565495642018
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.598051252168
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.3421607185391
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0931149065611
ans =
Berm Factor Calculation: Iteration 22, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.092848210124
ans =
!----- End Berm Factor Calculation, Iter: 22 -----!
berm_width =
    53
rB =
    0.321275767559983

```

```

rdh_mean =
0.492317890757056
gamma_berm =
0.836894040676502
slope =
0.189582097838795
Irb =
1.50241427474885
gamma_berm =
0.836894040676502
gamma_perm =
1
gamma_beta =
1
gamma_rough =
0.8
gamma =
0.669515232541202
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.5821919823113
R2del =
0.366513897351266
Z2 =
20.6630699224886
ans =
!----- STARTING ITERATION 23 -----!
Ztoe =
-0.930442000000001
toe_sta =
-9.45764232317425
top_sta =
162.75519205228
Z2 =
20.6630699224886
H0 =
6.5053
Tp =
9.8292
T0 =
8.93563636363636
R2 =
11.5821919823113
Z2 =
20.6630699224886
top_sta =
162.75519205228
Lslope =
172.212834375454
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 3
dh =
9.44047794017723
rdh_sum =
0.825438151688443
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 4
dh =
9.38707794017723
rdh_sum =
1.64595486277061
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 17
dh =
7.99657794017723
rdh_sum =
2.32213336207064
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 18
dh =
7.94017794017723
rdh_sum =
2.99192314833066
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 19
dh =
7.88545294017723
rdh_sum =
3.65548384530095
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 20
dh =
7.83240294017723
rdh_sum =
4.31297883818023
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 21

```

```
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 54
```

```
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3277176739801
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6179197610868
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9090116855086
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2035967567752
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 113
```

```
dh =  
    -4.41609705982277  
rdh_sum =  
    16.5214098320966  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.8460051435015  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.1760446664026  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.5101720073271  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    17.8498376680687  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.1965087309231  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.5508671481773  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 120  
dh =  
    -4.76582205982277  
rdh_sum =  
    18.91360265401  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 143  
dh =  
    -7.39397205982277  
rdh_sum =  
    19.6242025588196  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 144  
dh =  
    -7.43687205982277  
rdh_sum =  
    20.3400649754954  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 145  
dh =  
    -7.45072205982277  
rdh_sum =  
    21.0576201545515  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 146  
dh =  
    -7.43552205982277  
rdh_sum =  
    21.7733174093982  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 147  
dh =  
    -7.42109705982277  
rdh_sum =  
    22.4872480783994  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 148  
dh =  
    -7.40744705982277  
rdh_sum =  
    23.1995040571309  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 149  
dh =  
    -7.42874705982277  
rdh_sum =  
    23.914372007946  
ans =  
Berm Factor Calculation: Iteration 23, Profile Segment: 150
```

```

dh =
    -7.48499705982277
rdh_sum =
    24.636103064242
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349548046779
ans =
Berm Factor Calculation: Iteration 23, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.6341442331406
ans =
!----- End Berm Factor Calculation, Iter: 23 -----!
berm_width =
    54
rB =
    0.313565479575527
rdh_mean =
    0.493224893206307
gamma_berm =
    0.841092820601297
slope =
    0.182666391822615
Irb =
    1.44760817461005
gamma_berm =
    0.841092820601297
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672874256481037
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.2156780849568
R2del =
    0.366513897354508
Z2 =
    20.2965560251341
top_sta =
    155.509670345683
ans =
!----- STARTING ITERATION 24 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.509670345683
Z2 =
    20.2965560251341
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.2156780849568
Z2 =
    20.2965560251341
top_sta =
    155.509670345683
Lslope =
    164.967312668857
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 17

```

```
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 42
```

```
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 107
```



```
dh =  
    -4.20859705982277  
rdh_sum =  
    15.3448186432086  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 108  
dh =  
    -4.19474705982277  
rdh_sum =  
    15.6520369737552  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 109  
dh =  
    -4.20197205982277  
rdh_sum =  
    15.9601893473229  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 110  
dh =  
    -4.23027205982277  
rdh_sum =  
    16.2720078560203  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 113  
dh =  
    -4.41609705982277  
rdh_sum =  
    16.6081821914824  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 114  
dh =  
    -4.46964705982277  
rdh_sum =  
    16.9514605534708  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 115  
dh =  
    -4.51242205982277  
rdh_sum =  
    17.3004389228671  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 116  
dh =  
    -4.54442205982277  
rdh_sum =  
    17.6536956919985  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 117  
dh =  
    -4.58762205982277  
rdh_sum =  
    18.012746938437  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 118  
dh =  
    -4.64202205982277  
rdh_sum =  
    18.3791241872104  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 119  
dh =  
    -4.70142205982277  
rdh_sum =  
    18.7535361582816  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 120  
dh =  
    -4.76582205982277  
rdh_sum =  
    19.1366983835332  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 143  
dh =  
    -7.39397205982277  
rdh_sum =  
    19.8765458696038  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 144  
dh =  
    -7.43687205982277  
rdh_sum =  
    20.6216478026577  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 145  
dh =  
    -7.45072205982277  
rdh_sum =  
    21.3684385804437  
ans =  
Berm Factor Calculation: Iteration 24, Profile Segment: 146
```

```

dh =
    -7.43552205982277
rdh_sum =
    22.1133756991471
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8565495642052
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5980512521716
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.342160718543
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0931149065652
ans =
Berm Factor Calculation: Iteration 24, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0928482101281
ans =
!----- End Berm Factor Calculation, Iter: 24 -----!
berm_width =
    53
rB =
    0.321275767560015
rdh_mean =
    0.492317890757135
gamma_berm =
    0.836894040676511
slope =
    0.189582097838794
Irb =
    1.50241427474884
gamma_berm =
    0.836894040676511
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.669515232541209
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.5821919823114
R2del =
    0.366513897354563
Z2 =
    20.6630699224886
ans =
!----- STARTING ITERATION 25 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    162.755192052281
Z2 =
    20.6630699224886
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.5821919823114
Z2 =
    20.6630699224886
top_sta =
    162.755192052281

```

```
Lslope =
    172.212834375455
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 25
dh =
    7.69510294017723
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 33
dh =
    7.24027794017723
```

```
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 58
dh =
    5.12765294017723
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 76
dh =
    2.50927794017723
```

```
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3277176739801
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6179197610868
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.9090116855086
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2035967567752
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.5214098320966
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.8460051435015
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.1760446664025
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.5101720073271
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 117
dh =
    -4.58762205982277
rdh_sum =
    17.8498376680687
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.1965087309231
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.5508671481773
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    18.91360265401
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 143
dh =
    -7.39397205982277
```

```

rdh_sum =
    19.6242025588196
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.3400649754954
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.0576201545515
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    21.7733174093982
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.4872480783993
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.1995040571309
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    23.9143720079459
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    24.636103064242
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    25.6349548046778
ans =
Berm Factor Calculation: Iteration 25, Profile Segment: 164
dh =
    -11.3722470598228
rdh_sum =
    26.6341442331405
ans =
!----- End Berm Factor Calculation, Iter: 25 -----!
berm_width =
    54
rB =
    0.313565479575524
rdh_mean =
    0.493224893206306
gamma_berm =
    0.841092820601298
slope =
    0.182666391822613
Irb =
    1.44760817461004
gamma_berm =
    0.841092820601298
gamma_perm =
    1
gamma_beta =
    1
gamma_rough =
    0.8
gamma =
    0.672874256481038
ans =
!!! - - Iribaren number: 1.22 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.5 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
    11.2156780849567
R2del =
    0.366513897354656
Z2 =
    20.296556025134

```

```

top_sta =
    155.509670345682
ans =
!----- STARTING ITERATION 26 -----!
Ztoe =
    -0.930442000000001
toe_sta =
    -9.45764232317425
top_sta =
    155.509670345682
Z2 =
    20.296556025134
H0 =
    6.5053
Tp =
    9.8292
T0 =
    8.93563636363636
R2 =
    11.2156780849567
Z2 =
    20.296556025134
top_sta =
    155.509670345682
Lslope =
    164.967312668856
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 3
dh =
    9.44047794017723
rdh_sum =
    0.825438151688443
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 4
dh =
    9.38707794017723
rdh_sum =
    1.64595486277061
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 17
dh =
    7.99657794017723
rdh_sum =
    2.32213336207064
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 18
dh =
    7.94017794017723
rdh_sum =
    2.99192314833066
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 19
dh =
    7.88545294017723
rdh_sum =
    3.65548384530095
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 20
dh =
    7.83240294017723
rdh_sum =
    4.31297883818023
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 21
dh =
    7.78595294017723
rdh_sum =
    4.96514151294615
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 22
dh =
    7.74610294017723
rdh_sum =
    5.61271424888236
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 23
dh =
    7.72220294017723
rdh_sum =
    6.25752759133528
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 24
dh =
    7.71425294017723
rdh_sum =
    6.90142198673567
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 25
dh =
    7.69510294017723

```

```
rdh_sum =
    7.54310064739652
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 26
dh =
    7.66475294017723
rdh_sum =
    8.18126150062113
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 31
dh =
    7.33335294017723
rdh_sum =
    8.78056850432131
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 32
dh =
    7.27870294017723
rdh_sum =
    9.37340049557242
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 33
dh =
    7.24027794017723
rdh_sum =
    9.96167009073367
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 34
dh =
    7.21807794017723
rdh_sum =
    10.5473002782499
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 41
dh =
    6.40175294017723
rdh_sum =
    11.0347994799675
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 42
dh =
    6.34290294017723
rdh_sum =
    11.5151973290393
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 45
dh =
    6.14475294017723
rdh_sum =
    11.9717220878773
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 46
dh =
    6.08190294017723
rdh_sum =
    12.4206928792001
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 53
dh =
    5.33000294017723
rdh_sum =
    12.7806933545553
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 54
dh =
    5.29545294017723
rdh_sum =
    13.1366943100205
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 55
dh =
    5.24855294017723
rdh_sum =
    13.4872821942789
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 56
dh =
    5.18930294017723
rdh_sum =
    13.8310590851163
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 57
dh =
    5.14900294017723
rdh_sum =
    14.1702215370752
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 58
dh =
    5.12765294017723
```



```
rdh_sum =
    14.5069455107336
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 73
dh =
    2.53522794017723
rdh_sum =
    14.5977428733925
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 74
dh =
    2.51512794017723
rdh_sum =
    14.6871505717091
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 75
dh =
    2.50647794017723
rdh_sum =
    14.775963205213
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 76
dh =
    2.50927794017723
rdh_sum =
    14.8649682646294
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 77
dh =
    2.48360294017723
rdh_sum =
    14.9522158952165
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 78
dh =
    2.42945294017723
rdh_sum =
    15.0358091035397
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 107
dh =
    -4.20859705982277
rdh_sum =
    15.3448186432086
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 108
dh =
    -4.19474705982277
rdh_sum =
    15.6520369737552
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 109
dh =
    -4.20197205982277
rdh_sum =
    15.960189347323
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 110
dh =
    -4.23027205982277
rdh_sum =
    16.2720078560203
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 113
dh =
    -4.41609705982277
rdh_sum =
    16.6081821914825
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 114
dh =
    -4.46964705982277
rdh_sum =
    16.9514605534708
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 115
dh =
    -4.51242205982277
rdh_sum =
    17.3004389228672
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 116
dh =
    -4.54442205982277
rdh_sum =
    17.6536956919985
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 117
dh =
    -4.58762205982277
```

```

rdh_sum =
    18.0127469384371
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 118
dh =
    -4.64202205982277
rdh_sum =
    18.3791241872105
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 119
dh =
    -4.70142205982277
rdh_sum =
    18.7535361582817
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 120
dh =
    -4.76582205982277
rdh_sum =
    19.1366983835333
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 143
dh =
    -7.39397205982277
rdh_sum =
    19.8765458696039
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 144
dh =
    -7.43687205982277
rdh_sum =
    20.6216478026578
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 145
dh =
    -7.45072205982277
rdh_sum =
    21.3684385804438
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 146
dh =
    -7.43552205982277
rdh_sum =
    22.1133756991472
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 147
dh =
    -7.42109705982277
rdh_sum =
    22.8565495642053
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 148
dh =
    -7.40744705982277
rdh_sum =
    23.5980512521717
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 149
dh =
    -7.42874705982277
rdh_sum =
    24.3421607185431
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 150
dh =
    -7.48499705982277
rdh_sum =
    25.0931149065654
ans =
Berm Factor Calculation: Iteration 26, Profile Segment: 163
dh =
    -11.3322970598228
rdh_sum =
    26.0928482101282
ans =
!----- End Berm Factor Calculation, Iter: 26 -----!
berm_width =
    53
rB =
    0.321275767560016
rdh_mean =
    0.492317890757137
gamma_berm =
    0.836894040676511
slope =
    0.189582097838794
Irb =
    1.50241427474884
gamma_berm =
    0.836894040676511

```

```

gamma_perm =
1
gamma_beta =
1
gamma_rough =
0.8
gamma =
0.669515232541209
ans =
!!! - - Iribaren number: 1.26 is in the valid range (0.5-10), TAW RECOMMENDED - - !!!
ans =
!!! - - slope: 1:5.3 V:H is in the valid range (1:8 - 1:1), TAW RECOMMENDED - - !!!
R2_new =
11.5821919823114
R2del =
0.366513897354656
Z2 =
20.6630699224886
% final 2% runup elevation
Z2=R2_new+SWEL
Z2 =
20.6630699224886
diary off
-1.000000e+00
-1.000000e+00

```