

APPENDIX B

Program List

Title

```
Private Sub Timer1_Timer()  
    Unload FormTitle  
    form1.Show  
End Sub
```

Form1 (Input Form)

```
Private Sub CmdInput_Click()  
'clear inputbox
```

```
Dim ctl As Control  
For Each ctl In Form2  
    If TypeOf ctl Is TextBox Then ctl.Text = ""  
Next ctl  
For Each ctl In Form3  
    If TypeOf ctl Is TextBox Then ctl.Text = ""  
Next ctl  
For Each ctl In Form4  
    If TypeOf ctl Is TextBox Then ctl.Text = ""  
Next ctl  
For Each ctl In Form5  
    If TypeOf ctl Is TextBox Then ctl.Text = ""  
Next ctl
```

```
Form2.Caption = "Regular Wave Model "  
Form3.Caption = "Regular Wave Model "  
Form4.Caption = "Regular Wave Model "  
Form5.Caption = "Regular Wave Model "
```

```
Form2.Show  
Unload form1  
End Sub
```

```
Private Sub CmdCalculate_Click()  
'calculate
```

```
Dim n, NG, i, t  
Dim Lo(200, 2), A1(200, 2), A2(200, 2), A3(200, 2), m(200), s(200), d(200, 2)  
Dim y(200, 2), k(200, 2), c(200, 2), d1, d2, d3, d4, d5, d6, pi, NN(200, 2)  
Dim Gamma(200, 2), DB(200, 2), H(200, 2), Hb(200, 2), MWi(200, 2), Sxx(200, 2)
```

```
Unload Form2  
Unload Form3  
Unload Form4  
Unload Form5
```

```
Hi = Hi.Text  
Ti = Ti.Text
```

```
'select topofile to run the model  
On Error GoTo errorhandel1  
CommonDialog1.DialogTitle = "Select topography file to run"  
CommonDialog1.FileName = ""  
CommonDialog1.Filter = "Text Document/*.txt/All Files/*.*"  
CommonDialog1.ShowOpen  
CommonDialog1.CancelError = True  
topofile = CommonDialog1.FileName
```

```
Open topofile For Input As #2  
Open "c:\windows\slope.txt" For Output As #3  
Open "c:\windows\Hb.txt" For Output As #6
```

```
For n = 0 To 201
```

```
    If EOF(2) Then
```

```

NG = Val((n - 1))
n = 0
Do Until n > Val(NG)
  If n < Val(NG) Then
    s(n) = ((ho(n + 1) - ho(n)) / ((x(n + 1) - x(n)) * 100))
    If n = 0 Then
      m(n) = s(n)
      m(n) = Format$(m(n), "0.0000")
    ElseIf n = Val(NG) Then
      m(n) = s(n - 1)
      m(n) = Format$(m(n), "0.0000")
    ElseIf n > 0 And n < NG Then
      m(n) = (s(n) + s(n - 1)) / 2
      m(n) = Format$(m(n), "0.0000")
    End If
  Else: GoTo NextCal
  End If
  Print #3, m(n)
  n = n + 1
Loop
Else
  Input #2, x(n), ho(n)
End If

```

Next n

NextCal:

```

'calculate c,k,n
d1 = 0.6666666666
d2 = 0.3555555555
d3 = 0.1608465608
d4 = 0.0632098765
d5 = 0.0217540484
d6 = 0.0065407983
pi = 3.14159265358979
Ti = Val('Ti)

```

For t = 0 To 1

```

For n = 0 To Val(NG)
  If t = 0 Then
    d(n, t) = ho(n)
  Else
    d(n, t) = ho(n) + MWi(n, t - 1)
  End If
  If n = 0 Then
    H(n, t) = Val('Hi)
  End If
Next n

```

Next n

```

For n = 0 To Val(NG)
  If d(n, t) <= 0 Or x(n) = 0 Then
    y(n, t) = 0
    k(n, t) = 0
    c(n, t) = 0
    NN(n, t) = 0
  Else
    y(n, t) = (((2 * pi) ^ 2 * d(n, t)) / ((Ti ^ 2) * 980))
    k(n, t) = (((y(n, t) ^ 2 + (y(n, t) / (1 + (d1 * y(n, t) + (d2 * y(n, t) ^ 2) + (d3 * y(n, t) ^ 3) + (d4 * y(n, t) ^ 4) + (d5 * y(n, t) ^ 5) + (d6 * y(n, t) ^ 6)))) ^ 0.5 / d(n, t)))
    c(n, t) = (2 * pi) / (Ti * k(n, t))
    NN(n, t) = (0.5 * (1 + ((2 * k(n, t) * d(n, t)) / ((Exp(2 * k(n, t) * d(n, t)) - Exp(-2 * k(n, t) * d(n, t))) / 2))))
  End If
Next n

```

'check breaking index

```

For n = 0 To Val(NG - 1)
  If d(n, t) <= 0 Or x(n) = 0 Then
    Hb(n, t) = 0
  Else
    Lo(n, t) = (980 * Ti ^ 2) / (2 * pi)
    A1(n, t) = 0.53 - 0.3 * Exp(-3 * (d(n, t) / Lo(n, t)) ^ 0.5)

    If m(n) > 0 Then
      A2(n, t) = 5 * (m(n) ^ 1.5) * (Exp(-45 * ((d(n, t) / Lo(n, t)) ^ 0.5 - 0.1) ^ 2))
    Else
      A2(n, t) = 0
    End If

    A3(n, t) = pi * ((Exp(k(n, t) * d(n, t)) + Exp(-k(n, t) * d(n, t))) / (Exp(k(n, t) * d(n, t)) - Exp(-k(n, t) *
      d(n, t)))) ^ 2
    Hb(n, t) = (Lo(n, t) / A3(n, t)) * (A1(n, t) + A2(n, t))
    Print #6, Hb(n, t)
  End If

  If H(n, t) < Hb(n, t) Then
    DB(n, t) = 0
  Else
    'calculate for Gamma,DB
    If d(n, t) <= 0 Or x(n) = 0 Then
      DB(n, t) = 0
    Else
      Gamma(n, t) = Exp((-22.22 * m(n) ^ 2) - (1.25 * (d(n, t) / (c(n, t) * Ti * H(n, t)) ^ 0.5)) - 0.31)
      Gamma(n, t) = Format(Gamma(n, t), "0.00")
      DB(n, t) = (0.17 * (c(n, t) * NN(n, t) * 1 * 980 / (8 * d(n, t))) * (H(n, t) ^ 2 - (Gamma(n, t) *
        d(n, t) ^ 2))
      If DB(n, t) > 0 Then
        DB(n, t) = Format(DB(n, t), "###,##0")
      Else
        DB(n, t) = 0
      End If
    End If
  End If

  'calculate for wave height
  If d(n + 1, t) <= 0 Or x(n + 1) = 0 Then
    H(n + 1, t) = 0
    MWi(n + 1, t) = 0
  Else
    If (H(n, t) ^ 2 * c(n, t) * NN(n, t)) > (8 * DB(n, t) * 100 * Abs(x(n + 1) - x(n)) / (1 * 980)) Then
      H(n + 1, t) = (((H(n, t) ^ 2 * c(n, t) * NN(n, t)) - (8 * DB(n, t) * 100 * Abs(x(n + 1) - x(n)) / (1 * 980))) /
        (c(n + 1, t) * NN(n + 1, t))) ^ 0.5
    Else
      H(n + 1, t) = 0.001
    End If

    Sxx(n, t) = (2 * NN(n, t) - 0.5) * 1 * 980 * H(n, t) ^ 2 / 8
    Sxx(n + 1, t) = (2 * NN(n + 1, t) - 0.5) * 1 * 980 * H(n + 1, t) ^ 2 / 8

    If n = 0 Then
      MWi(n, t) = -(Sxx(n, t) / (1 * 980 * d(n + 1, t)))
    End If

    MWi(n + 1, t) = MWi(n, t) + -(Sxx(n + 1, t) - Sxx(n, t)) / (1 * 980 * d(n + 1, t))
  End If

  Next n
Next t
'print to outputform and to Temp_solution for plotting graph

```

Open "c:\windows\Temp_solution.txt" For Output As #4

For n = 0 To Val(NG)

If n = 0 Then

MWi(n, 1) = 0

MWi(n, 1) = Format\$(MWi(n, 1), "0.00")

H(n, 1) = Format\$(H(n, 1), "0.00")

Form7.Hcp(n) = H(n, 1)

Form7.Hcp(n) = Format\$(Form7.Hcp(n), "0.00")

Form7.MW(n) = MWi(n, 1)

Form7.MW(n) = Format\$(Form7.MW(n), "0.00")

Print #4, H(n, 1), MWi(n, 1)

ElseIf n > 0 And n < Val(NG) Then

MWi(n, 1) = Format\$(MWi(n, 1), "0.00")

H(n, 1) = Format\$(H(n, 1), "0.00")

If n > 0 And n < 50 Then

Form7.Hcp(n) = H(n, 1)

Form7.Hcp(n) = Format\$(Form7.Hcp(n), "0.00")

Form7.MW(n) = MWi(n, 1)

Form7.MW(n) = Format\$(Form7.MW(n), "0.00")

Print #4, H(n, 1), MWi(n, 1)

ElseIf n > 49 And n < 100 Then

Form8.Hcp(n) = H(n, 1)

Form8.Hcp(n) = Format\$(Form8.Hcp(n), "0.00")

Form8.MW(n) = MWi(n, 1)

Form8.MW(n) = Format\$(Form8.MW(n), "0.00")

Print #4, H(n, 1), MWi(n, 1)

ElseIf n > 99 And n < 150 Then

Form9.Hcp(n) = H(n, 1)

Form9.Hcp(n) = Format\$(Form9.Hcp(n), "0.00")

Form9.MW(n) = MWi(n, 1)

Form9.MW(n) = Format\$(Form9.MW(n), "0.00")

Print #4, H(n, 1), MWi(n, 1)

ElseIf n > 149 Then

Form10.Hcp(n) = H(n, 1)

Form10.Hcp(n) = Format\$(Form10.Hcp(n), "0.00")

Form10.MW(n) = MWi(n, 1)

Form10.MW(n) = Format\$(Form10.MW(n), "0.00")

Print #4, H(n, 1), MWi(n, 1)

End If

End If

If n = Val(NG - 1) Then

MWi(n + 1, 1) = Format\$(MWi(n + 1, 1), "0.00")

H(n + 1, 1) = Format\$(H(n + 1, 1), "0.00")

If n > 0 And n < 50 Then

Form7.Hcp(n + 1) = H(n + 1, 1)

Form7.Hcp(n + 1) = Format\$(Form7.Hcp(n + 1), "0.00")

Form7.MW(n + 1) = MWi(n + 1, 1)

Form7.MW(n + 1) = Format\$(Form7.MW(n + 1), "0.00")

Print #4, H(n + 1, 1), MWi(n + 1, 1)

ElseIf n > 49 And n < 100 Then

Form8.Hcp(n + 1) = H(n + 1, 1)

Form8.Hcp(n + 1) = Format\$(Form8.Hcp(n + 1), "0.00")

Form8.MW(n + 1) = MWi(n + 1, 1)

Form8.MW(n + 1) = Format\$(Form8.MW(n + 1), "0.00")

Print #4, H(n + 1, 1), MWi(n + 1, 1)

ElseIf n > 99 And n < 150 Then

Form9.Hcp(n + 1) = H(n + 1, 1)

Form9.Hcp(n + 1) = Format\$(Form9.Hcp(n + 1), "0.00")

Form9.MW(n + 1) = MWi(n + 1, 1)

Form9.MW(n + 1) = Format\$(Form9.MW(n + 1), "0.00")

Print #4, H(n + 1, 1), MWi(n + 1, 1)

ElseIf n > 149 Then

Form10.Hcp(n + 1) = H(n + 1, 1)

```

        Form10.Hcp(n + 1) = Format$(Form10.Hcp(n + 1), "0.00")
        Form10.MW(n + 1) = MWi(n + 1, 1)
        Form10.MW(n + 1) = Format$(Form10.MW(n + 1), "0.00")
        Print #4, H(n + 1, 1), MWi(n + 1, 1)

    End If
End If
Next n

For i = 1 To Val(100)
    If ProgressBar1.Value < ProgressBar1.Max Then
        ProgressBar1.Value = ProgressBar1.Value + 1
    End If
Next i

MsgBox "Calculation Complete", vbInformation
Close #2, #3, #4, #6
Form7.Show
form1.Hide
ProgressBar1.Value = 0
Exit Sub

errorhandel1: Exit Sub
End Sub

Private Sub Cmdopen_Click()
'open topofile

Dim n, NG, x#, y#
Dim ctl As Control

    For Each ctl In Form2
        If TypeOf ctl Is TextBox Then ctl.Text = ""
    Next ctl
    For Each ctl In Form3
        If TypeOf ctl Is TextBox Then ctl.Text = ""
    Next ctl
    For Each ctl In Form4
        If TypeOf ctl Is TextBox Then ctl.Text = ""
    Next ctl
    For Each ctl In Form5
        If TypeOf ctl Is TextBox Then ctl.Text = ""
    Next ctl

On Error GoTo ErrHandler
CommonDialog1.DialogTitle = "Open topography "
CommonDialog1.FileName = ""
CommonDialog1.Filter = "Text Document/*.txt/All Files/*.*"
CommonDialog1.ShowOpen
CommonDialog1.CancelError = True
topofile = CommonDialog1.FileName

Form2.Caption = " " & topofile & ""
Form3.Caption = " " & topofile & ""
Form4.Caption = " " & topofile & ""
Form5.Caption = " " & topofile & ""

Open topofile For Input As #2

On Error GoTo gridcount
For n = 0 To 200
    If n < 50 Then
        Input #2, x#, y#
        Form2.x(n) = x#
        Form2.ho(n) = y#
        Form2.x(n) = Format$(Form2.x(n), "#0.00")
        Form2.ho(n) = Format$(Form2.ho(n), "#0.00")
    End If
Next n

```

```

ElseIf n > 49 And n < 100 Then
    Input #2, x#, y#
    Form3.x(n) = x#
    Form3.ho(n) = y#
    Form3.x(n) = Format$(Form3.x(n), "#0.00")
    Form3.ho(n) = Format$(Form3.ho(n), "#0.00")
ElseIf n > 99 And n < 150 Then
    Input #2, x#, y#
    Form4.x(n) = x#
    Form4.ho(n) = y#
    Form4.x(n) = Format$(Form4.x(n), "#0.00")
    Form4.ho(n) = Format$(Form4.ho(n), "#0.00")
ElseIf n > 149 Then
    Input #2, x#, y#
    Form5.x(n) = x#
    Form5.ho(n) = y#
    Form5.x(n) = Format$(Form5.x(n), "#0.00")
    Form5.ho(n) = Format$(Form5.ho(n), "#0.00")
End If
Next n

Close #2
Form2.Show

gridcount: NG = Val((n - 1))
Close #2
Form2.Show
Exit Sub

ErrorHandler: Exit Sub
End Sub

Private Sub CmdSaveAs_Click()
'save topofile

Dim n, NG

For n = 0 To 49
    If Form2.x(n).Text = "" Then
        GoTo gridcount
    End If
Next n

For n = 50 To 99
    If Form3.x(n).Text = "" Then
        GoTo gridcount
    End If
Next n

For n = 100 To 149
    If Form4.x(n).Text = "" Then
        GoTo gridcount
    End If
Next n

For n = 150 To 200
    If Form5.x(n).Text = "" Then
        GoTo gridcount
    End If
Next n

gridcount:
NG = (n - 1)

If n < 50 Then
    Form2.x(n) = Form2.x(n).Text
    Form2.ho(n) = Form2.ho(n).Text

```

```

ElseIf n > 49 And n < 100 Then
    Form3.x(n) = Form3.x(n).Text
    Form3.ho(n) = Form3.ho(n).Text
ElseIf n > 99 And n < 150 Then
    Form4.x(n) = Form4.x(n).Text
    Form4.ho(n) = Form4.ho(n).Text
ElseIf n > 149 And n < 201 Then
    Form5.x(n) = Form5.x(n).Text
    Form5.ho(n) = Form5.ho(n).Text
End If

On Error GoTo ErrHandler
CommonDialog1.DialogTitle = "Save topography as"
CommonDialog1.FileName = "*.txt"
CommonDialog1.Filter = "Text Files/*.txt"
CommonDialog1.CancelError = True
CommonDialog1.ShowSave
topofile = CommonDialog1.FileName

Open topofile For Output As #2

For n = 0 To NG

If n < 50 Then
    Form2.x(n) = Format$(Form2.x(n), "#0.00")
    Form2.ho(n) = Format$(Form2.ho(n), "#0.00")
    Print #2, Form2.x(n), Form2.ho(n)
ElseIf n > 49 And n < 100 Then
    If n < 50 Then
        Form2.x(n) = Format$(Form2.x(n), "#0.00")
        Form2.ho(n) = Format$(Form2.ho(n), "#0.00")
        Print #2, Form2.x(n), Form2.ho(n)
    Else
        Form3.x(n) = Format$(Form3.x(n), "#0.00")
        Form3.ho(n) = Format$(Form3.ho(n), "#0.00")
        Print #2, Form3.x(n), Form3.ho(n)
    End If
ElseIf n > 99 And n < 150 Then
    If n < 50 Then
        Form2.x(n) = Format$(Form2.x(n), "#0.00")
        Form2.ho(n) = Format$(Form2.ho(n), "#0.00")
        Print #2, Form2.x(n), Form2.ho(n)
    ElseIf n > 49 And n < 100 Then
        Form3.x(n) = Format$(Form3.x(n), "#0.00")
        Form3.ho(n) = Format$(Form3.ho(n), "#0.00")
        Print #2, Form3.x(n), Form3.ho(n)
    Else
        Form4.x(n) = Format$(Form4.x(n), "#0.00")
        Form4.ho(n) = Format$(Form4.ho(n), "#0.00")
        Print #2, Form4.x(n), Form4.ho(n)
    End If
ElseIf n > 149 Then
    If n < 50 Then
        Form2.x(n) = Format$(Form2.x(n), "#0.00")
        Form2.ho(n) = Format$(Form2.ho(n), "#0.00")
        Print #2, Form2.x(n), Form2.ho(n)
    ElseIf n > 49 And n < 100 Then
        Form3.x(n) = Format$(Form3.x(n), "#0.00")
        Form3.ho(n) = Format$(Form3.ho(n), "#0.00")
        Print #2, Form3.x(n), Form3.ho(n)
    ElseIf n > 99 And n < 150 Then
        Form4.x(n) = Format$(Form4.x(n), "#0.00")
        Form4.ho(n) = Format$(Form4.ho(n), "#0.00")
        Print #2, Form4.x(n), Form4.ho(n)
    Else
        Form5.x(n) = Format$(Form5.x(n), "#0.00")
        Form5.ho(n) = Format$(Form5.ho(n), "#0.00")

```



```
        Print #2, Form5.x(n), Form5.ho(n)
    End If
End If
Next n
```

```
Close #2
```

```
ErrorHandler:
Exit Sub
```

```
End Sub
```

```
Private Sub CmdExit_Click()
'exit from program
End
End Sub
```

Form2 (Topography 1)

```
Private Sub CmdNext_Click()
'next
Form3.Show
Form2.Hide
End Sub
```

```
Private Sub CmdEnd_Click()
'end
form1.Show
Form2.Hide
End Sub
```

Form3 (Topography 2)

```
Private Sub CmdNext_Click()
'next
Form4.Show
Form3.Hide
End Sub
```

```
Private Sub CmdEnd_Click()
'end
form1.Show
Form3.Hide
End Sub
```

```
Private Sub CmdPrevious_Click()
'previous
Form2.Show
Form3.Hide
End Sub
```

Form4 (Topography 3)

```
Private Sub CmdNext_Click()
'next
Form5.Show
Form4.Hide
End Sub
```

```
Private Sub CmdEnd_Click()
'end
form1.Show
Form4.Hide
End Sub
```

```
Private Sub CmdPrevious_Click()
'previous
```

```
Form3.Show
Form4.Hide
End Sub
```

Form5 (Topography 4)

```
Private Sub CmdPrevious_Click()
'previous
Form4.Show
Form5.Hide
End Sub
```

```
Private Sub CmdEnd_Click()
'end
form1.Show
Form5.Hide
End Sub
```

Form6 (Wave height and mean water level)

```
Private Sub CmdOpenOutput_Click()
'show result of calculation
Form7.Show
Form6.Hide
End Sub
```

```
Private Sub CmdSaveOutput_Click()
'save outputfile
```

```
Ti = form1.Ti.Text
```

```
On Error GoTo ErrHandler
CommonDialog1.DialogTitle = "Save output as"
CommonDialog1.FileName = "*.txt"
CommonDialog1.Filter = "Text Files/*.txt"
CommonDialog1.CancelError = True
CommonDialog1.ShowSave
outputfile = CommonDialog1.FileName
```

```
Open topofile For Input As #2
Open "c:\windows\Temp_solution.txt" For Input As #4
Open outputfile For Output As #5
```

```
'format of outputfile
```

```
For n = 0 To 201
```

```
  If EOF(2) Then
```

```
    NG = Val(n - 1)
```

```
    n = 0
```

```
    Print #5, Spc(10);
```

```
  "=====
```

```
    Print #5, Spc(70); "Department of Civil Engineering"
```

```
    Print #5, Spc(60); "Sirindhorn International Institute of Technology"
```

```
    Print #5, Spc(10);
```

```
  "=====
```

```
    Print #5,
```

```
    Print #5, Spc(20), "" & Format(Date$, "mmmm d, yyyy") & " " & Format(Time$, "hh:mm:ss AM/PM") & ""
```

```
    Print #5, Spc(20), "File name = " & outputfile & ""
```

```
    Print #5, Spc(20), "Topography file = " & topofile & ""
```

```
    Print #5,
```

```
    Print #5, Spc(20), "x = distance (m)"
```

```
    Print #5, Spc(20), "ho = still water depth (cm)"
```

```
    Print #5, Spc(20), "T = period (sec)"
```

```
    Print #5, Spc(20), "H = wave height (cm)"
```

```
    Print #5, Spc(20), "MWL = mean water level (cm)"
```

```
    Print #5,
```

```
    Print #5, Spc(20), Spc(2); "x (m)", Spc(1); "ho (cm)", Spc(1); "T (sec)", " H (cm)", " MWL (cm)"
```

```
    Print #5,
```

```

Do Until n > Val(NG + 1)
  If n <= NG Then
    x(n) = Format$(x(n), "#0.00")
    ho(n) = Format$(ho(n), "#0.00")
    Ti := Format$(Ti, "#0.00")
    H(n) = Format$(H(n), "#0.00")
    MWi(n) = Format$(MWi(n), "#0.00")
    Print #5, Spc(20), Spc(7 - Len(x(n))); (x(n)), Spc(7 - Len(ho(n))); ho(n), Spc(7 - Len(Ti)); Ti, Spc(7 -
Len(H(n))); H(n), Spc(7 - Len(MWi(n))); MWi(n)
  Else
    GoTo FinishPrinting
  End If
  n = n + 1
Loop

Else
  Input #2, x(n), ho(n)
  Input #4, H(n), MWi(n)
End If
Next n

FinishPrinting:
Close #2, #4, #5

ErrorHandler: Exit Sub

End Sub

Private Sub CmdBeachGraph_Click()
'show beach profile graph
Form11.Show
End Sub

Private Sub CmdNextCal_Click()
'clear output form for next calculation

Dim ctl As Control

For Each ctl In Form7
  If TypeOf ctl Is TextBox Then ctl.Text = ""
Next ctl
For Each ctl In Form8
  If TypeOf ctl Is TextBox Then ctl.Text = ""
Next ctl
For Each ctl In Form9
  If TypeOf ctl Is TextBox Then ctl.Text = ""
Next ctl
For Each ctl In Form10
  If TypeOf ctl Is TextBox Then ctl.Text = ""
Next ctl

Unload Form7
Unload Form8
Unload Form9
Unload Form10

form1.Show
Unload Form6

End Sub

Private Sub CmdPrintOutput_Click()
'select file to print

Dim pw, ph, px, py, BcginPage, EndPage
On Error GoTo ErrorHandler
CommonDialog1.DialogTitle = "Print output file"

```

```

CommonDialog1.FileName = "*.txt"
CommonDialog1.Filter = "Text Files/*.txt"
CommonDialog1.CancelError = True
CommonDialog1.ShowOpen
outputfile = CommonDialog1.FileName

'print outputfile
pw = Printer.Width * 0.5
ph = Printer.Height * 0.5
px = (Printer.Width - pw) / 2
py = (Printer.Height - ph) / 2
CdlPrint.ShowPrinter
Printer.Orientation = 1
Form12.RTB1.LoadFile outputfile
Form12.RTB1.Font.Name = "cordiaUPC"
Form12.RTB1.Font.Size = 14
Printer.FontName = "cordiaUPC"
Printer.FontSize = 14
Printer.Print Form12.RTB1.Text
Printer.EndDoc
Close #5
Exit Sub

ErrorHandler:
  MsgBox "There was a problem printing to your printer."
  Exit Sub

End Sub
Private Sub CmdExit_Click()
'exit
End
End Sub

```

Form7 (Output 1)

```

Private Sub CmdNext_Click()
'next
Form8.Show
Form7.Hide
End Sub

```

```

Private Sub CmdEnd_Click()
'end
Form6.Show
Form7.Hide
End Sub

```

Form8 (Output 2)

```

Private Sub CmdNext_Click()
'next
Form9.Show
Form8.Hide
End Sub

```

```

Private Sub CmdEnd_Click()
'end
Form6.Show
Form8.Hide
End Sub

```

```

Private Sub CmdPrevious_Click()
'previous
Form7.Show
Form8.Hide
End Sub

```

Form9 (Output 3)

```
Private Sub CmdNext_Click()  
'next  
Form10.Show  
Form9.Hide  
End Sub
```

```
Private Sub CmdEnd_Click()  
'end  
Form6.Show  
Form9.Hide  
End Sub
```

```
Private Sub CmdPrevious_Click()  
'previous  
Form8.Show  
Form9.Hide  
End Sub
```

Form10 (Output 4)

```
Private Sub CmdPrevious_Click()  
'previous  
Form9.Show  
Form10.Hide  
End Sub
```

```
Private Sub CmdEnd_Click()  
'end  
Form6.Show  
Form10.Hide  
End Sub
```

Form11 (Beach Graph)

```
Private Sub Form_Load()  
'draw beach profile  
  
Dim Z, i, NG, n  
Open topofile For Input As #2  
Open "c:\windows\Temp_solution.txt" For Input As #4  
  
Hi = form1.Hi.Text  
Ti = form1.Ti.Text  
  
'read data, scale and draw graph  
AutoRedraw = True  
LetterHeight = TextHeight("X")  
LetterWidth = TextWidth("X")  
  
For n = 0 To 201  
  If EOF(2) Then  
    If x(n - 1) > x(0) Then  
      Xright = x(n - 1)  
      Xleft = x(0)  
    Else  
      Xright = x(0)  
      Xleft = x(n - 1)  
    End If  
  
    If ho(0) > ho(n - 1) Then  
      Ylower = ho(0)  
    Else  
      Ylower = ho(n - 1)  
    End If
```

```

NG = Val(n - 1)
n = 0
Do Until n > Val(NG)
  If n < Val(NG) Then
    DrawStyle = 0
    DrawWidth = 2
    Xrange = Abs(Xright - Xleft)
    Ymax = Hi + 120
    Ymin = (-Int(Ylower / 100) - 1) * 100
    Xmax = Xright + 50
    border = 50
    Scale ((-border), (Ymax + 250))-((Xmax + border), (Ymin - 150))

    Line (x(n), -ho(n))-((x(n + 1), -ho(n + 1))), RGB(150, 20, 20)
    Line (x(n), Hcp(n))-((x(n + 1), Hcp(n + 1))), RGB(12, 24, 255)
    Line (x(n), MW(n))-((x(n + 1), MW(n + 1))), RGB(130, 161, 223)
  Else
    GoTo DrawGraph
  End If
  n = n + 1
Loop
Else
  Input #2, x(n), ho(n)
  Input #4, Hcp(n), MW(n)

End If

Next n

DrawGraph:
CurrentX = -50 + (Xmax + border) / 2
CurrentY = Ymax + 240
FontSize = 12
FontStyle = Bold
Print "Beach Profile"
CurrentX = -80 + (Xmax + border) / 3
CurrentY = Ymax + 170
FontSize = 8
FontStyle = Normal
Print "Hi = " & Hi & " cm. Ti = " & Ti & " sec. Beach profile = " & topofile & ""

DrawStyle = 0
DrawWidth = 1

'Y-Axis
Line (0, Ymax)-(0, Ymin)
Line (0, Ymax)-(-3, (Ymax - 15))
Line (0, Ymax)-(3, (Ymax - 15))

'upper Y-axis
i = 0
Npitch = 10
DNpitch = Int(Ymax / Npitch) + 1

If DNpitch <= 50 Then
  DNpitch = 50
Else
  DNpitch = (Int((Int(Ymax / Npitch) + 1) / 50) + 1) * 50
End If
CurrentX = -70 + (LetterWidth / 2)
CurrentY = Ymax + 50
Print "H ( x " & DNpitch & " cm.)"

For Z = 0 To (Ymax - 30) Step 10
  If Z Mod DNpitch = 0 Then
    Line (0, Z)-(-3, Z)
    CurrentX = -65 + (LetterWidth / 2)
  End If

```

```

    CurrentY = Z + 15
    If i < 0 Then
        Print i
    End If
    i = i + 1
End If
Next Z

'lower Y-axis and label
i = 0
For Z = 0 To Ymin Step -10
    If Z Mod -DNpitch = 0 Then
        Line (0, Z)-(3, Z)
        CurrentX = -65 + (LetterWidth / 2)
        CurrentY = Z + 15
        Print i
        i = i - 1
    End If
Next Z

'X-Axis
Line (0, Ymin)-(Xmax, Ymin)
Line (Xmax, Ymin)-((Xmax - 7), (Ymin + 10))
Line (Xmax, Ymin)-((Xmax - 7), (Ymin - 10))

'scale and label on X-axis
i = 1
Npitch = 10
DNpitch = (100 * (Int(Xmax / 100) + 1)) / Npitch
CurrentX = ((Xmax - 80) / 2)
CurrentY = Ymin - 70

If x(0) < x(n) Then
    Print "Distance from Offshore ( x " & DNpitch & " m.)"
Else
    Print "Distance from Inshore ( x " & DNpitch & " m.)"
End If

For Z = 0 To (Xmax - 20) Step 10
    If Z Mod DNpitch = 0 Then
        Line (Z, Ymin + 6)-(Z, Ymin)
        CurrentX = Z + (DNpitch - 3)
        CurrentY = Ymin - 5
        If i <= (Xmax / DNpitch) - 1 Then
            Print i
        End If
        i = i + 1
    End If
Next Z

'mean water level line
DrawStyle = 2
DrawWidth = 1
Line (0, 0)-(Xmax, 0), RGB(130, 161, 223)
CurrentX = Xmax
CurrentY = 10
Print "SWL"

'line definition
DrawStyle = 1
DrawWidth = 2
Line (Xmax, Ymax - 50)-(Xmax + 10, Ymax - 50), RGB(12, 24, 225)
CurrentX = (Xmax + 12)
CurrentY = (Ymax - 35)
Print "H"
Line (Xmax, Ymax - 80)-(Xmax + 10, Ymax - 80), RGB(130, 161, 223)
CurrentX = (Xmax + 12)

```

```

CurrentY = (Ymax - 65)
Print "MW"

Line (Xmax, Ymax - 110)-(Xmax + 10, Ymax - 110), RGB(150, 20, 20)
CurrentX = (Xmax + 12)
CurrentY = (Ymax - 95)
Print "Sea Bottom"

Close #2, #4

End Sub

Private Sub Form_MouseMove(Button As Integer, Shift As Integer, x As Single, y As Single)
Dim DistX, LevelY

Line1.BorderStyle = 3
Line1.X1 = 0
Line1.Y1 = y
Line1.X2 = x
Line1.Y2 = y

Line2.BorderStyle = 3
Line2.X1 = x
Line2.Y1 = Ymin
Line2.X2 = x
Line2.Y2 = y

DistX = Format$(x, "#0.00")
LevelY = Format$(y, "#0.00")

Label2.Caption = "(" & DistX & ", " & LevelY & ")"
Label2.Left = x + 10
Label2.Top = y

End Sub

Private Sub cmdPrintBeach_Click()
'Print beach profile

Dim pw, ph, px, py

cmdGraph.CancelError = True
On Error GoTo ErrHandler
cmdGraph.ShowPrinter
pw = Printer.Width * 0.6
ph = Printer.Height * 0.6
px = (Printer.Width - pw) / 2
py = (Printer.Height - ph) / 2
Form11.ScaleMode = 3
Printer.Orientation = 1
Printer.ScaleMode = 1
Printer.DrawWidth = 1
Printer.PaintPicture Form11.Image, px, py, pw, ph
Printer.EndDoc
Form11.ScaleMode = 1
Exit Sub

ErrHandler:
MsgBox "There was a problem printing to your printer."
Exit Sub
End Sub

Private Sub CmdBack_Click()
Form6.Show
Unload Form11
End Sub

```


Module

Option Explicit

```
'Wave Characteristic and Topographic Map  
Public X(200), ho(200), Hcp(200), H(200), MWi(200), MW(200)  
Public topofile$, outputfile$, slope$  
Public DNpitch$, Xmax$, Ymax$, Ymin$, Xrange$
```