```
Dim mulai, tukang, an1, an2, an3, an4, an5, an6, an7, an8, an9
Dim ah1(100), ac1(100), aphi1(100), ag1(100)

Public Sub open_file()
frm_utama.CommonDialog1.CancelError = True
On Error GoTo ErrHandler
frm_utama.CommonDialog1.Flags = cdlOFNHideReadOnly
frm_utama.CommonDialog1.Filter = "All Files (*.*)|*.*|Abut Files (*.ASAPin)|*.ASAPin"
frm_utama.CommonDialog1.FilterIndex = 2
frm_utama.CommonDialog1.ShowOpen
Open frm_utama.CommonDialog1.FileName For Input As #1
With frm_utama
  Input #1, mulai
  Input #1, tukang
    .lbl_project.Caption = mulai
    .lbl_eng.Caption = tukang
  Input #1, an1, an2, an3, an4, an5, an6, an7, an8, an9, an10, an11
    .n1.Text = an1
    .n2.Text = an2
    .n3.Text = an3
    .n4.Text = an4
    .n5.Text = an5
    .n6.Text = an6
    .n7.Text = an7
    .n8.Text = an8
    .n9.Text = an9
    .n10.Text = an10
    .n11.Text = an11
  Input #1, slope1
    .txt_slope.Text = slope1
  Input #1, water1
    .txt_water.Text = water1
  Input #1, tt1
    .txt_tt.Text = tt1
  Input #1, psoil1
    .txt_psoil.Text = psoil1
  Input #1, lapisan1
    .n_lapisan.Text = lapisan1
    .grid_tanah.Rows = lapisan1 + 2
  For i = 1 To lapisan1
    Input #1, ah1(i), ac1(i), aphi1(i), ag1(i)
    .grid_tanah.TextMatrix(i + 1, 1) = ah1(i)
    .grid_tanah.TextMatrix(i + 1, 2) = ac1(i)
    .grid_tanah.TextMatrix(i + 1, 3) = aphi1(i)
    .grid_tanah.TextMatrix(i + 1, 4) = ag1(i)
  Next i
  Input #1, vd1
  .txt_vd.Text = vd1
  Input #1, hd1
  .txt_hd.Text = hd1
  Input #1, txt_qload1
  .txt_qload.Text = txt_qload1
```

```
   Input #1, txt_pload1
   .txt_pload.Text = txt_pload1
   Input #1, txt_p_a1
   .txt_p_a.Text = txt_p_a1
   Input #1, txt_lineload1
   .txt_lineload.Text = txt_lineload1
   Input #1, txt_line_a1
   .txt_line_a.Text = txt_line_a1
   Input #1, txt_striploadl
   .txt_striploadl.Text = txt_striploadl
   Input #1, txt_strip_a1
   .txt_strip_a.Text = txt_strip_a1
   Input #1, txt_strip_b1
   .txt_strip_b.Text = txt_strip_b1
   Input #1, txt_kh1
   .txt_kh.Text = txt_kh1
   Input #1, txt_kv1
   .txt_kv.Text = txt_kv1
   Input #1, txt_bjbeton1
   .txt_bjbeton.Text = txt_bjbeton1
   Input #1, sf_turning1
   .sf_turning.Text = sf_turning1
   Input #1, sf_slip1
   .sf_slip.Text = sf_slip1
End With
Close #1


  Exit Sub
ErrHandler:
  Exit Sub
End Sub

Public Sub save_file()
frm_utama.CommonDialog1.CancelError = True
On Error GoTo ErrHandler
frm_utama.CommonDialog1.Flags = cdlOFNHideReadOnly
frm_utama.CommonDialog1.Filter = "All Files (*.*)|*.*|Abut Files (*.ASAPin)|*.ASAPin"
frm_utama.CommonDialog1.FilterIndex = 2
frm_utama.CommonDialog1.ShowSave
Open frm_utama.CommonDialog1.FileName For Output As #1
Print #1, """"; frm_mulai.txt_project.Text & """"
Print #1, """"; frm_mulai.txt_eng.Text & """"
With frm_utama
   Print #1, .n1, .n2, .n3, .n4, .n5, .n6, .n7, .n8, .n9, .n10, .n11
   Print #1, .txt_slope
   Print #1, .txt_water
   Print #1, .txt_tt
   Print #1, .txt_psoil
   Print #1, .n_lapisan
   For i = 1 To .n_lapisan
      With frm_utama.grid_tanah
```

```
        Print #1, .TextMatrix(i + 1, 1), .TextMatrix(i + 1, 2), .TextMatrix(i + 1, 3), .TextMatrix(i + 1, 4)
      End With
    Next i
    Print #1, .txt_vd
    Print #1, .txt_hd
    Print #1, .txt_qload
    Print #1, .txt_pload
    Print #1, .txt_p_a
    Print #1, .txt_lineload
    Print #1, .txt_line_a
    Print #1, .txt_striploadPrint #1, .txt_strip_a
    Print #1, .txt_strip_b
    Print #1, .txt_kh
    Print #1, .txt_kv
    Print #1, .txt_bjbeton
    Print #1, .sf_turning
    Print #1, .sf_slip
End With
Close #1

    Exit Sub
ErrHandler:
    Exit Sub
End Sub

Public Sub print_file()
frm_utama.CommonDialog1.CancelError = True
On Error GoTo ErrHandler
frm_utama.CommonDialog1.ShowPrinter
Exit Sub
ErrHandler:
Exit Sub
End Sub

Public Sub jalan()
Call hitung_ka
    'Call gaya_tekanantanah
    Call gaya_beratsendiri
    Call gaya_timbunan
    Call gayaluar
    Call gaya_q
    If frm_utama.txt_pload > 0 Then
        Call gaya_titik
    End If
    If frm_utama.txt_lineload > 0 Then
        Call gaya_garis
    End If
    If frm_utama.txt_striploadload > 0 Then
        Call gaya_rata
    End If
    Call gaya_air
```

```
    Call total_gaya
    Call DDT
    Call print_total
    Call m_dinding
    Call m_lantai
    Call sf_guling
    Call sf_geser
    Call info_output
    Load frm_gayadalam
    If SF_T < frm_utama.sf_turning.Text Then
       rotasi
    End If
End Sub

Option Explicit
Public Const phi = 3.14159265358979
Public Const konv_rad = (3.14159265358979 / 180)
Public A As Double
Public n, i, j, k, l As Integer
Public Cx, Cy As Single
Public Cxt, Cyt As Single
Public Xn(100), Yn(100) As Single
Public Xt(100), yt(100) As Single
Public Xr(100), Yr(100) As Single
Public ymax, xmin, xmax, ymin As Single
Public LebarObj As Single
Public g_bahan As Single
Public H_air As Single
Public kh, kv As Single
Public Ps, Ms, Mt As Double
Public Pw, Mw As Single
Public PH, PV, MV, MH As Single
Public SF_T, SF_S As Single
Public Pt, pts(100) As Single
Public Pp, Mp, hp As Single
Public n1, n2, n3, n4, n5, n6, n7, n8, n9 As Single
Public Ka(100), Kp(100), Kae(100), Kae1(100) As Single
Public pastV(100), pastH(100), pakV(100), pakH(100), MastV(100), MastH(100), MakV(100),
MakH(100), x_tanah(100), x_tanahmax As Single
Public pastgV(100), pastgH(100), pakgV(100), pakgH(100), MastgV(100), MastgH(100),
MakgV(100), MakgH(100) As Single
Public tepi_tanah, tepi_q, tepi_p, tepi_l, tepi_w As Single
Public PaqV(100), PaqH(100), Paql(100), MaqV(100), MaqH(100), pqH, mqH, pqV, mqV As Single
Public htanah(100), gt(100), phit(100), ct(100) As Single
Public ptanahV, mtanahV, ptanahgV, mtanahgV, ptanahH, mtanahH, ptanahgH, mtanahgH As
Single
Public nq, nc, ng, qult, e, q1, q2 As Single
Public vd, hd, vl, hl, mvd, mhd, mvl, mhl As Single
Public pm, dh As Single
Public alfa, beta, delta As Single
Public q, ht, bt, htotal As Single
Public x_q(100), y_q(100), x_qmax As Single
```

```
Public x_p(200), y_p(200), x_pmax As Single
Public x_l(200), y_l(200), x_lmax As Single
Public x_s(200), y_s(200), x_smax As Single
Public a_t, p_t, PZ_t, YZ_t, XJ_t(200), S_t(200), JM_t, M_t(200), pias As Single
Public a_l, p_l, PZ_l, YZ_l, XJ_l(200), S_l(200), JM_l, M_l(200) As Single
Public a_s, p_s, PZ_s, YZ_s, XJ_s(200), S_s(200), JM_s, M_s(200) As Single
Public xi(1000)
Public xzt(120), yzt(120), xz(120), yz(120), pastl(120), pakl(120), pastgl(120), pakgl(120) As Single
Public ptanahtotH, ptanahtotV, mtanahtotH, mtanahtotV, ptanahgtotH, ptanahgtotV,
mtanahgtotH, mtanahgtotV As Single
Public D_din, m_din, m_dinz, P_din As Single
Public D_lant, M_lant, D_lanh, M_lanh As Single
Public Xtim, Ytim, Wtim, Mtim As Single
'=========================================================================
'                       TITIK BERAT ABUTMEN
'=========================================================================
Public Sub luas_titikberat()
Dim jcx, jcy, ja As Double
Call input_koordinat
ja = 0
jcx = 0
jcy = 0
Cx = 0
Cy = 0
For i = 1 To n
   ja = ja + (((Xn(i) * Yn(i + 1)) - (Xn(i + 1) * Yn(i)))) / 2
Next i
A = ja
For i = 1 To n
   Rumus titik berat
Next i
Cx = jcx / (6 * A)
Cy = jcy / (6 * A)
End Sub
'=========================================================================
'                       KOEFISIEN TEKANAN TANAH
'=========================================================================
Public Sub hitung_ka()
Dim pertamaxx, pertamax, n As Single
n = Val(frm_utama.n_lapisan)
For i = 2 To n + 1
   Ka(i - 1) = 0
   Kp(i - 1) = 0
Next i
For i = 2 To n + 1
          Rumus Ka dan Kp
Next i
End Sub
'=========================================================================
'                       KOEFISIEN GEMPA
'=========================================================================
Public Sub hitung_kae()
```

```
Dim garpux, pertamax, keduax, ketigax, n As Single
Call hitung_ka
n = Val(frm_utama.n_lapisan)
kh = Val(frm_utama.txt_kh.Text)
kv = Val(frm_utama.txt_kv.Text)
beta = Val(frm_utama.txt_slope.Text) * konv_rad
delta = 0
alfa = 0
garpux = (Atn(kh / (1 - kv)))
If kh = 0 And kv = 0 Then
      garpux = 0
End If
For i = 2 To n + 1
  Rumus Kae
Next i
End Sub
'=========================================================================
'                        GAYA AKIBAT BERAT SENDIRI
'=========================================================================
Public Sub gaya_beratsendiri()
g_bahan = Val(frm_utama.txt_bjbeton.Text)
Call luas_titikberat
Ps = A * g_bahan
Ms = Ps * Cx
End Sub
'=========================================================================
'                        GAYA AKIBAT TANAH TIMBUNAN
'=========================================================================
Public Sub gaya_timbunan()
Dim jumpt, B, bm As Single
Call input_koordinat
n = Val(frm_utama.n_lapisan.Text)
If frm_utama.opt_1.Value = True Then
  B = n2 - n4 - n5
  bm = n4 + n5 + ((n2 - n4 - n5) / 2)
ElseIf frm_utama.opt_2.Value = True Then
  B = n5
  bm = n2 - (n5 / 2)
End If
jumpt = 0
For i = 1 To n
          Rumus timbunan
Next i
Pt = jumpt
Mt = Pt * bm
End Sub
'=========================================================================
'                        GAYA AKIBAT TANAH TIMBUNAN DEPAN
'=========================================================================
Public Sub gaya_timbunandepan()
Dim jumpt As Single
Dim bm, c1, c2, psoil, gp, hp As Single
```

```
Call input_koordinat
n = Val(frm_utama.n_lapisan.Text)
psoil = Val(frm_utama.txt_psoil.Text)
gp = Val(frm_utama.grid_tanah.TextMatrix(psoil + 1, 4))
hp = Val(frm_utama.txt_tt)
If hp <= n3 Then GoTo 123
        Rumus timbunan depan
123
End Sub
'=========================================================================
'               GAYA AKIBAT TEKANAN TANAH LATERAL STATIK
'=========================================================================
Public Sub gaya_tekanantanah()
Dim bt, ht, n As Single
Call hitung_ka
bt = 0
ht = 0
ptanahV = 0
mtanahV = 0
ptanahH = 0
mtanahH = 0
n = Val(frm_utama.n_lapisan.Text)
beta = Val(frm_utama.txt_slope.Text) * konv_rad
        Tegangan Tanah
ptanahtotH = ptanahH
ptanahtotV = ptanahV
mtanahtotH = mtanahH
mtanahtotV = mtanahV
End Sub
'=========================================================================
'               GAYA AKIBAT TEKANAN TANAH PASIF
'=========================================================================
Public Sub gaya_tekanantanahpasif()
Dim bt, ht, psoil, cp, gp As Single
Call hitung_ka
bt = 0
ht = 0
n = Val(frm_utama.n_lapisan.Text)
hp = Val(frm_utama.txt_tt.Text)
psoil = Val(frm_utama.txt_psoil.Text)
cp = Val(frm_utama.grid_tanah.TextMatrix(psoil + 1, 2))
gp = Val(frm_utama.grid_tanah.TextMatrix(psoil + 1, 4))
        TEKANAN TANAH
End Sub
'=========================================================================
'             GAYA AKIBAT TEKANAN TANAH LATERAL DINAMIK
'=========================================================================
Public Sub gaya_tekanantanahdinamik()
Dim bt, ht As Single
If frm_utama.txt_kh = "" And frm_utama.txt_kh = "" Then
   ptanahgtotH = 0
   ptanahgtotV = 0
```

```
   mtanahgtotH = 0
   mtanahgtotV = 0
ElseIf frm_utama.txt_kh <> 0 And frm_utama.txt_kh <> 0 Then
   Call hitung_ka
   Call hitung_kae
   bt = 0
   ht = 0
   ptanahgV = 0
   mtanahgV = 0
   ptanahgH = 0
   mtanahgH = 0
   n = Val(frm_utama.n_lapisan)
   beta = Val(frm_utama.txt_slope.Text)
          TEKANAN TANAH LATERAL DINAMIK
   ptanahgtotH = ptanahgH
   ptanahgtotV = ptanahgV
   mtanahgtotH = mtanahgH
   mtanahgtotV = mtanahgV
End If
End Sub
'=========================================================================
'                    GAYA AKIBAT PERLETAKAN JEMBATAN
'=========================================================================
Public Sub gayaluar()
vd = Val(frm_utama.txt_vd)
hd = Val(frm_utama.txt_hd)
mvd = vd * (n4 + 0.5 * n6)
mhd = hd * (n1 - n8)
mvl = vl * (n4 + n6 + n7)
mhl = hl * (n1)
End Sub
'=========================================================================
'                    GAYA AKIBAT BEBAN MERATA (q)
'=========================================================================
Public Sub gaya_q()
Dim jpqV, jmqV, jpqH, jmqH
Call hitung_ka
q = Val(frm_utama.txt_qload.Text)
n = Val(frm_utama.n_lapisan.Text)
beta = Val(frm_utama.txt_slope.Text) * konv_rad
jpqV = 0
jmqV = 0
jpqH = 0
jmqH = 0
ht = 0
          TEKANAN AKIBAT BEBAN MERATA
pqV = jpqV
pqH = jpqH
mqV = jmqV
mqH = jmqH
End Sub
'=========================================================================
```

```
'                    GAYA AKIBAT BEBAN TITIK
'=========================================================================
Public Sub gaya_titik()
Dim jm_tx, ht, yt As Single
a_t = Val(frm_utama.txt_p_a.Text)
p_t = Val(frm_utama.txt_pload.Text)
If p_t = 0 Then
   GoTo 123
Else
pm = a_t / n1
pias = 0
jm_tx = 0
ht = 0
          TEKANAN AKIBAT BEBAN TITIK
End If
123
End Sub
'=========================================================================
'                    GAYA AKIBAT BEBAN STRIP
'=========================================================================
Public Sub gaya_rata()
Dim alfa(110), beta(110) As Single
Dim a_s, b_s, p_s, z_s(110), ht, ys, JM_sx As Single
a_s = Val(frm_utama.txt_strip_a)
b_s = Val(frm_utama.txt_strip_b)
p_s = Val(frm_utama.txt_striploat.Text)
          TEKANAN AKIBAT BEBAN STRIP
End Sub
'=========================================================================
'                    GAYA AKIBAT BEBAN MERATA GARIS
'=========================================================================
Public Sub gaya_garis()
Dim ht, yl, JM_lx As Single
a_l = Val(frm_utama.txt_line_a)
p_l = Val(frm_utama.txt_lineload.Text)
If p_l = 0 Then
   GoTo 123
Else
pm = a_l / n1
pias = 0
JM_lx = 0
ht = 0
          TEKANAN AKIBAT BEBAN GARIS
123
End Sub
'=========================================================================
'                    GAYA AKIBAT TEKANAN AIR
'=========================================================================
Public Sub gaya_air()
If Val(frm_utama.txt_water) > 0 Then
   H_air = n1 - Val(frm_utama.txt_water)
   Pw = 0.5 * 1 * H_air ^ 2
```

```
   Mw = Pw * H_air / 3
Else
   Pw = 0
   Mw = 0
End If
End Sub
'=========================================================================
'                          CEK  STABILITAS
'=========================================================================
Public Sub total_gaya()
Call luas_titikberat
Call gaya_tekanantanah
Call gaya_tekanantanahpasif
Call gaya_tekanantanahdinamik
Call gaya_q
Call gaya_timbunan
Call gaya_timbunandepan
If frm_utama.txt_pload > 0 Then
   Call gaya_titik
End If
If frm_utama.txt_lineload > 0 Then
   Call gaya_garis
End If
If frm_utama.txt_striploaD > 0 Then
   Call gaya_rata
End If
MV = mvd + Mt + Ms + mqV + mtanahtotV + mtanahgtotV + Mtim
MH = mtanahtotH + mqH + Mw + mhd + JM_l + JM_s + mtanahgtotH + Mp
PV = Ps + Pt + vd + pqV + ptanahtotV + ptanahgtotV + Wtim
PH = ptanahtotH + hd + pqH + Pw + PZ_t + PZ_l + PZ_s + ptanahgtotH + Pp
End Sub
Public Sub sf_guling()
SF_T = MV / MH
End Sub
Public Sub sf_geser()
n = Val(frm_utama.n_lapisan)
ct(n) = Val(frm_utama.grid_tanah.TextMatrix(n + 1, 2))
phit(n) = Val(frm_utama.grid_tanah.TextMatrix(n + 1, 3))
SF_S = ((PV * Tan(phit(n) * konv_rad)) + (ct(n) * n2)) / PH
End Sub
'=========================================================================
'                          DAYA DUKUNG TANAH
'=========================================================================
Public Sub DDT()
Dim ae, n As Single
Call total_gaya
n = Val(frm_utama.n_lapisan.Text)
ct(n) = Val(frm_utama.grid_tanah.TextMatrix(n + 1, 2))
phit(n) = Val(frm_utama.grid_tanah.TextMatrix(n + 1, 3))
gt(n) = Val(frm_utama.grid_tanah.TextMatrix(n + 1, 4))
          HITUNG DDT
End Sub
```

```
'=========================================================================
'                       TABEL TEK. LATERAL OVERBUDEN
'=========================================================================
Public Sub tabel_gayatanah()
Dim k, j, l As Integer
'Call gaya_tekanantanah
n = Val(frm_utama.n_lapisan)
htotal = 0
ht = 0
For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   htotal = htotal + htanah(i)
Next i
xz(0) = 0
yz(0) = 0
xi(0) = 0
pakl(0) = 0
pastl(0) = 0
For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   ht = ht + htanah(i)
   xi(i) = ht / htotal * 100
Next i
For j = 1 To n
   xz(j) = Int(xi(j))
   yz(j) = pakl(j - 1) + pastl(j)
   For k = Int(xi(j - 1)) To Int(xi(j))
      yzt(k) = ((k - xz(j)) * (yz(j) - yz(j - 1)) / (xz(j) - xz(j - 1))) + yz(j)
      frm_gayatotal.flextotal.TextMatrix(k + 1, 1) = Round(yzt(k), 3)
   Next k
Next j
End Sub
'=========================================================================
'                       TABEL TEK. LATERAL MERATA
'=========================================================================
Public Sub tabel_gayaq()
Dim spasi, awal
Dim k, j, l As Integer
Call gaya_q
n = Val(frm_utama.n_lapisan)
htotal = 0
ht = 0

For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   htotal = htotal + htanah(i)
Next i

xi(0) = 0

For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
```

```
   ht = ht + htanah(i)
   xi(i) = ht / htotal * 100
Next i

For j = 1 To n
   For k = Int(xi(j - 1)) To Int(xi(j))
      frm_gayatotal.flextotal.TextMatrix(k + 1, 3) = Round(Paql(j), 3)
   Next k
Next j
End Sub
'======================================================================
'                        TABEL TEK. LATERAL GEMPA
'======================================================================
Public Sub tabel_gayagempa()
Dim k, j, l As Integer
Call gaya_tekanantanahdinamik
n = Val(frm_utama.n_lapisan)
htotal = 0
ht = 0

For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   htotal = htotal + htanah(i)
Next i

xz(0) = 0
yz(0) = 0
xi(0) = 0
pakgl(0) = 0
pastgl(0) = 0

For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   ht = ht + htanah(i)
   xi(i) = ht / htotal * 100
Next i

For j = 1 To n
   xz(j) = Int(xi(j))
   yz(j) = pakgl(j - 1) + pastgl(j)
   For k = Int(xi(j - 1)) To Int(xi(j))
      yzt(k) = ((k - xz(j)) * (yz(j) - yz(j - 1)) / (xz(j) - xz(j - 1))) + yz(j)
      frm_gayatotal.flextotal.TextMatrix(k + 1, 2) = Round(yzt(k), 3)
   Next k
Next j
End Sub
'======================================================================
'                        TABEL TEK. LATERAL AIR
'======================================================================
Public Sub tabel_gayaair()
Dim jarak
Dim i, k As Integer
```

```
Call gaya_air

H_air = Val(frm_utama.txt_water)

jarak = Int(H_air * 100 / n1) + 1

For i = 1 To jarak
   frm_gayatotal.flextotal.TextMatrix(i, 7) = 0
Next i

For k = jarak + 1 To 101
   frm_gayatotal.flextotal.TextMatrix(k, 7) = Round((k / 101), 3)
Next k
End Sub

'=========================================================================
'                    MOMEN PADA DINDING
'=========================================================================
Public Sub m_dinding()
Dim jarak As Integer
Dim pias, awal, akhir As Single
Call input_koordinat
Call print_total
jarak = Int((n1 - n3) * 100 / n1)
pias = 0
m_din = 0
m_dinz = 0
For i = 1 To jarak
   pias = pias + frm_gayatotal.flextotal.TextMatrix(i, 8)
Next i
awal = frm_gayatotal.flextotal.TextMatrix(1, 8)
akhir = frm_gayatotal.flextotal.TextMatrix(jarak, 8)
D_din = (0.01 / 2) * (awal + (2 * (pias - awal - akhir)) + akhir) * n1
P_din = Val(frm_utama.txt_vd)
For i = 1 To jarak
   m_dinz = m_dinz + (frm_gayatotal.flextotal.TextMatrix(i, 8) * ((n1 - n3) -
frm_gayatotal.flextotal.TextMatrix(i, 0)))
Next i
m_din = m_dinz * (n1 - n3) / 100
End Sub
'=========================================================================
'                    GAYA PADA LANTAI
'=========================================================================
Public Sub m_lantai()
Call input_koordinat
Call gaya_timbunan
Call DDT
Dim det, Stoe, Sheel As Single
Sheel = (q1 - q2) / n2
Stoe = (q1 - q2) / n2
g_bahan = Val(frm_utama.txt_bjbeton.Text)
```

GAYA PADA LANTAI

```
End Sub
'=========================================================================
'                        INPUT KOORDINAT
'=========================================================================
Public Sub input_koordinat()
n1 = Val(frm_utama.n1.Text)
n2 = Val(frm_utama.n2.Text)
n3 = Val(frm_utama.n3.Text)
n4 = Val(frm_utama.n4.Text)
n5 = Val(frm_utama.n5.Text)
n6 = Val(frm_utama.n6.Text)
n7 = Val(frm_utama.n7.Text)
n8 = Val(frm_utama.n8.Text)
n9 = Val(frm_utama.n9.Text)
n10 = Val(frm_utama.n10.Text)
n11 = Val(frm_utama.n11.Text)
If frm_utama.opt_1.Value = True Then
   n = 12
   Xn(1) = 0
   Xn(2) = n2
   Xn(3) = n2
   Xn(4) = n4 + n5
   Xn(5) = n4 + n5
   Xn(6) = n4 + n6 + n7
   Xn(7) = n4 + n6 + n7
   Xn(8) = n4 + n6
   Xn(9) = n4 + n6
   Xn(10) = n4
   Xn(11) = n4
   Xn(12) = 0
   Yn(1) = 0
   Yn(2) = 0
   Yn(3) = n3
   Yn(4) = n3 + n9
   Yn(5) = n1 - n8 - n10 - n11
   Yn(6) = n1 - n8 - n10
   Yn(7) = n1
   Yn(8) = n1
   Yn(9) = n1 - n8
   Yn(10) = n1 - n8
   Yn(11) = n3 + n9
   Yn(12) = n3
ElseIf frm_utama.opt_2.Value = True Then
   n1 = Val(frm_utama.n1)
   n2 = Val(frm_utama.n2)
   n3 = Val(frm_utama.n3)
   n4 = Val(frm_utama.n4)
   n5 = Val(frm_utama.n5)
   n6 = Val(frm_utama.n6)
   n = 8
   Xn(1) = 0
   Xn(2) = n2
```

```
   Xn(3) = n2
   Xn(4) = n2 - n5
   Xn(5) = n2 - n5
   Xn(6) = n2 - n5 - n6
   Xn(7) = n4
   Xn(8) = 0
   Yn(1) = 0
   Yn(2) = 0
   Yn(3) = n3
   Yn(4) = n3
   Yn(5) = n1
   Yn(6) = n1
   Yn(7) = n3
   Yn(8) = n3
End If
End Sub
'=====================================================================
'                        PLOT GAMBAR ABUTMEN
'=====================================================================
Public Sub Plotgambar()
Dim LebarObj, TinggiObj, Sps_Kosong_Horz, Sps_Kosong_Vert As Single
Dim BidangGbr_X, BidangGbr_Y, X1asli, X2asli, Y1asli, Y2asli As Single
Call input_koordinat
beta = Val(frm_utama.txt_slope)
Xn(n + 1) = Xn(1)
Yn(n + 1) = Yn(1)
xmin = 0
xmax = 0
ymin = 0
ymax = 0
For i = 1 To n
   If xmin > Xn(i) Then xmin = Xn(i)
   If xmax < Xn(i) Then xmax = Xn(i)
   If ymin > Yn(i) Then ymin = Yn(i)
   If ymax < Yn(i) Then ymax = Yn(i)
Next i
LebarObj = xmax - xmin
TinggiObj = ymax - ymin
With frm_utama.input_pic
   If LebarObj > TinggiObj Then
      .ScaleWidth = LebarObj * 1.85
      .ScaleHeight = .Height / .Width * .ScaleWidth
   Else
      .ScaleHeight = TinggiObj * 1.75
      .ScaleWidth = .Width / .Height * .ScaleHeight
   End If
   BidangGbr_X = .ScaleWidth
   BidangGbr_Y = .ScaleHeight
   Sps_Kosong_Horz = 3
   Sps_Kosong_Vert = (BidangGbr_Y - TinggiObj) * 0.35
   X1asli = -Sps_Kosong_Horz
   Y1asli = Sps_Kosong_Vert + TinggiObj
```

```
   X2asli = X1asli + .ScaleWidth
   Y2asli = Y1asli - .ScaleHeight
End With
frm_utama.input_pic.Scale (X1asli, Y1asli)-(X2asli, Y2asli)
frm_utama.input_pic.Cls
frm_utama.input_pic.FontBold = True
For i = 1 To n
   frm_utama.input_pic.CurrentX = Xn(i)
   frm_utama.input_pic.CurrentY = Yn(i)
   frm_utama.input_pic.ForeColor = vbWhite
   frm_utama.input_pic.Line (Xn(i), Yn(i))-(Xn(i + 1), Yn(i + 1)), vbGreen
Next i
If frm_utama.opt_1.Value = True Then
   frm_utama.input_pic.Line (Xn(7), ymax)-((n2 + 3), ymax + (Xn(7) * Tan(beta * konv_rad))),
vbYellow
   frm_utama.input_pic.Line (n2, ymin)-((n2 + 3), ymin), vbYellow
ElseIf frm_utama.opt_2.Value = True Then
   frm_utama.input_pic.Line (Xn(5), ymax)-((n2 + 3), ymax + (Xn(5) * Tan(beta * konv_rad))),
vbYellow
   frm_utama.input_pic.Line (n2, ymin)-((n2 + 3), ymin), vbYellow
End If
frm_utama.input_pic.Circle (Xn(1), Yn(1)), TinggiObj / 100, vbYellow
frm_utama.input_pic.Circle (Cx, Cy), TinggiObj / 100, vbBlue
End Sub
'=========================================================================
'                      ROTASI ABUTMEN
'=========================================================================
Public Sub rotasi()
Dim beta, sdt, TinggiObj, Sps_Kosong_Horz, Sps_Kosong_Vert As Single
Dim BidangGbr_X, BidangGbr_Y, X1asli, X2asli, Y1asli, Y2asli As Integer
Call input_koordinat
For i = 1 To n
   If Xn(i) = 0 Then
      beta = 90 * konv_rad
      Xr(i) = ((Xn(i) ^ 2 + Yn(i) ^ 2) ^ 0.5) * Cos(0.1 + beta)
      Yr(i) = ((Xn(i) ^ 2 + Yn(i) ^ 2) ^ 0.5) * Sin(0.1 + beta)
   ElseIf Xn(i) < 0 Then
      beta = (90 * konv_rad) + Atn(Abs(Xn(i)) / Yn(i))
      Xr(i) = ((Xn(i) ^ 2 + Yn(i) ^ 2) ^ 0.5) * Cos(0.1 + beta)
      Yr(i) = ((Xn(i) ^ 2 + Yn(i) ^ 2) ^ 0.5) * Sin(0.1 + beta)
   ElseIf Xn(i) > 0 Then
      beta = Atn(Yn(i) / Xn(i))
      Xr(i) = ((Xn(i) ^ 2 + Yn(i) ^ 2) ^ 0.5) * Cos(0.1 + beta)
      Yr(i) = ((Xn(i) ^ 2 + Yn(i) ^ 2) ^ 0.5) * Sin(0.1 + beta)
   End If
Next i
Xr(n + 1) = Xr(1)
Yr(n + 1) = Yr(1)
xmin = 0
xmax = 0
ymin = 0
ymax = 0
```

```
For i = 1 To n
   If xmin > Xr(i) Then xmin = Xr(i)
   If xmax < Xr(i) Then xmax = Xr(i)
   If ymin > Yr(i) Then ymin = Yr(i)
   If ymax < Yr(i) Then ymax = Yr(i)
Next i
LebarObj = xmax - xmin
TinggiObj = ymax - ymin
With frm_utama.input_pic
   If LebarObj > TinggiObj Then
      .ScaleWidth = LebarObj * 1.85
      .ScaleHeight = .Height / .Width * .ScaleWidth
   Else
      .ScaleHeight = TinggiObj * 1.75
      .ScaleWidth = .Width / .Height * .ScaleHeight
   End If
   BidangGbr_X = .ScaleWidth
   BidangGbr_Y = .ScaleHeight
   Sps_Kosong_Horz = 3
   Sps_Kosong_Vert = (BidangGbr_Y - TinggiObj) * 0.35
   X1asli = -Sps_Kosong_Horz
   Y1asli = Sps_Kosong_Vert + TinggiObj
   X2asli = X1asli + .ScaleWidth
   Y2asli = Y1asli - .ScaleHeight
End With
   frm_utama.input_pic.Scale (X1asli, Y1asli)-(X2asli, Y2asli)
   frm_utama.input_pic.Cls
   frm_utama.input_pic.FontBold = True
For i = 1 To n
   frm_utama.input_pic.CurrentX = Xr(i)
   frm_utama.input_pic.CurrentY = Yr(i)
   frm_utama.input_pic.Line (Xr(i), Yr(i))-(Xr(i + 1), Yr(i + 1)), vbRed
Next i
If frm_utama.opt_1.Value = True Then
   frm_utama.input_pic.Line (Xr(7), ymax)-((xmax + 3), ymax), vbYellow
   frm_utama.input_pic.Line (0, ymin)-((xmax + 3), ymin), vbYellow
ElseIf frm_utama.opt_2.Value = True Then
   frm_utama.input_pic.Line (Xr(5), ymax)-((xmax + 3), ymax), vbYellow
   frm_utama.input_pic.Line (0, ymin)-((xmax + 3), ymin), vbYellow
End If
End Sub
'=====================================================================
'                      PLOT GARIS LAPISAN TANAH
'=====================================================================
Public Sub lapisan_tanah()
Dim xmin, ymax, ti, lpsn(100) As Single
Call Plotgambar
n = Val(frm_utama.n_lapisan)
ti = 0
If frm_utama.opt_1.Value = True Then
   For i = 1 To n
   lpsn(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
```

```
   ti = ti + lpsn(i)
   frm_utama.input_pic.Line (Xn(3), (Yn(7) - ti))-((Xn(3) + 3), (Yn(7) - ti)), vbYellow
   frm_utama.input_pic.CurrentX = Xn(3) + 1
   frm_utama.input_pic.CurrentY = Yn(7) - ti + 0.5
   frm_utama.input_pic.Print "Lapisan " & i
   Next i
ElseIf frm_utama.opt_2.Value = True Then
   For i = 1 To n
   lpsn(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   ti = ti + lpsn(i)
   frm_utama.input_pic.Line (Xn(3), (Yn(5) - ti))-((Xn(3) + 3), (Yn(5) - ti)), vbYellow
   frm_utama.input_pic.CurrentX = Xn(3) + 1
   frm_utama.input_pic.CurrentY = Yn(5) - ti + 0.5
   frm_utama.input_pic.Print "Lapisan " & i
   Next i
End If
Call plot_tanahdepan
End Sub
'=========================================================================
'                        PLOT GARIS M.A.T.
'=========================================================================
Public Sub gamma_sub()
H_air = ymax - Val(frm_utama.txt_water.Text)
If H_air > 0 And H_air < ymax Then
   frm_utama.input_pic.Line (xmax, H_air)-((n2 + 3), H_air), vbBlue
   frm_utama.input_pic.CurrentX = xmax
   frm_utama.input_pic.CurrentY = H_air
   frm_utama.input_pic.Print "M.A.T."
ElseIf H_air > ymax Then
   MsgBox "ghghghg"
End If
End Sub
'=========================================================================
'                        PLOT TEGANGAN AKIBAT TANAH
'=========================================================================
Public Sub plot_tanah()
Call Plotgambar
Call gaya_tekanantanah
tepi_tanah = Xn(3) + 3.5
x_tanahmax = 0
ht = 0
n = Val(frm_utama.n_lapisan)
For i = 1 To n + 1
   x_tanah(i) = pakl(i - 1) + pastl(i)
   If x_tanahmax < x_tanah(i) Then x_tanahmax = x_tanah(i)
Next i
For i = 1 To n '+ 1
   'HORISONTAL
   ht = ht + htanah(i)
   frm_utama.input_pic.Line (tepi_tanah, n1 - ht)-(tepi_tanah + x_tanah(i), n1 - ht), vbRed
   'DIAGONAL
```

```
   frm_utama.input_pic.Line (tepi_tanah + x_tanah(i), n1 - ht)-(tepi_tanah + x_tanah(i + 1), n1 - ht
- htanah(i + 1)), vbRed
   frm_utama.input_pic.CurrentX = tepi_tanah
   frm_utama.input_pic.CurrentY = n1 - ht
   frm_utama.input_pic.Print Round(x_tanah(i), 3)
Next i
'GARIS TEPI
   frm_utama.input_pic.Line (tepi_tanah, 0)-(tepi_tanah, n1), vbRed
'GARIS DIAGONAL 1st
   frm_utama.input_pic.Line (tepi_tanah, n1)-(tepi_tanah + x_tanah(1), n1 - htanah(1)), vbRed
End Sub
'=========================================================================
'                       PLOT TEGANGAN AKIBAT q
'=========================================================================
Public Sub plot_q()
Call Plotgambar
Call gaya_q
Call plot_tanah
n = Val(frm_utama.n_lapisan.Text)
tepi_q = tepi_tanah + x_tanahmax + 0.5
ht = 0
x_qmax = 0
For i = 1 To n
   x_q(i) = Paql(i)
   If x_qmax < x_q(i) Then x_qmax = x_q(i)
Next i
For i = 1 To n
   htanah(i) = Val(frm_utama.grid_tanah.TextMatrix(i + 1, 1))
   'VERTIKAL
   frm_utama.input_pic.Line (tepi_q + x_q(i), n1 - ht)-(tepi_q + x_q(i), n1 - ht - htanah(i)), vbRed
   'HORISONTAL
   frm_utama.input_pic.Line (tepi_q, n1 - ht)-(tepi_q + x_q(i), n1 - ht), vbRed
   ht = ht + htanah(i)
   frm_utama.input_pic.CurrentX = tepi_q
   frm_utama.input_pic.CurrentY = n1 - ht
   frm_utama.input_pic.Print Round(x_q(i), 3)
   frm_utama.input_pic.Line (tepi_q, n1 - ht)-(tepi_q + x_q(i), n1 - ht), vbRed
Next i
'GARIS TEPI
If frm_utama.txt_qload.Text = 0 Then
   frm_utama.input_pic.Line (tepi_q, 0)-(tepi_q, n1), vbBlack
ElseIf frm_utama.txt_qload.Text > 0 Then
   frm_utama.input_pic.Line (tepi_q, 0)-(tepi_q, n1), vbRed
End If
End Sub
'=========================================================================
'                       PLOT TEGANGAN AKIBAT P
'=========================================================================
Public Sub plot_P()
Call Plotgambar
Call gaya_titik
Call plot_q
```

```
tepi_p = tepi_q + x_qmax + 1
x_pmax = 0
For i = 1 To 100
   If x_pmax < S_t(i) Then x_pmax = S_t(i)
Next i
For i = 1 To 100
   y_p(0) = n1
   x_p(0) = tepi_p
   y_p(i) = (1 - (i / 100)) * n1
   x_p(i) = tepi_p + (S_t(i) * 5)
   frm_utama.input_pic.Line (x_p(i - 1), y_p(i - 1))-(x_p(i), y_p(i)), vbRed
Next i
If frm_utama.txt_pload.Text = 0 Then
   frm_utama.input_pic.Line (tepi_p + S_t(100) * 5, 0)-(tepi_p, 0), vbBlack
   frm_utama.input_pic.Line (tepi_p, 0)-(tepi_p, n1), vbBlack
ElseIf frm_utama.txt_pload.Text > 0 Then
   frm_utama.input_pic.Line (tepi_p + S_t(100) * 5, 0)-(tepi_p, 0), vbRed
   frm_utama.input_pic.Line (tepi_p, 0)-(tepi_p, n1), vbRed
End If
End Sub
'=========================================================================
'                        PLOT TEGANGAN AKIBAT L
'=========================================================================
Public Sub plot_L()
Call Plotgambar
Call gaya_garis
Call plot_P
tepi_l = tepi_p + x_pmax + 1
x_lmax = 0
For i = 1 To 100
   If x_lmax < S_l(i) Then x_lmax = S_l(i)
Next i
For i = 1 To 100
   y_l(0) = n1
   x_l(0) = tepi_l
   y_l(i) = (1 - (i / 100)) * n1
   x_l(i) = tepi_l + (S_l(i) * 3)
   frm_utama.input_pic.Line (x_l(i - 1), y_l(i - 1))-(x_l(i), y_l(i)), vbRed
Next i
If frm_utama.txt_lineload.Text = 0 Then
   frm_utama.input_pic.Line (tepi_l + S_l(100) * 3, 0)-(tepi_l, 0), vbBlack
   frm_utama.input_pic.Line (tepi_l, 0)-(tepi_l, n1), vbBlack
ElseIf frm_utama.txt_lineload.Text > 0 Then
   frm_utama.input_pic.Line (tepi_l + S_l(100) * 3, 0)-(tepi_l, 0), vbRed
   frm_utama.input_pic.Line (tepi_l, 0)-(tepi_l, n1), vbRed
End If
End Sub
'=========================================================================
'                        PLOT TEGANGAN AKIBAT strip
'=========================================================================
Public Sub plot_S()
Call Plotgambar
```

```
Call gaya_rata
Call plot_L
tepi_s = tepi_l + x_lmax + 1
x_smax = 0
'For i = 1 To 100
   'If x_smax < S_s(i) Then x_smax = S_s(i)
'Next i
For i = 1 To 100
   y_s(0) = n1
   x_s(0) = tepi_s
   y_s(i) = (1 - (i / 100)) * n1
   x_s(i) = tepi_s + (S_s(i) * 0.1)
   If x_smax < x_s(i) Then x_smax = x_s(i)
   frm_utama.input_pic.Line (x_s(i - 1), y_s(i - 1))-(x_s(i), y_s(i)), vbRed
Next i
If frm_utama.txt_striploat = 0 Then
   frm_utama.input_pic.Line (tepi_s + S_s(100) * 0.1, 0)-(tepi_s, 0), vbBblack
   frm_utama.input_pic.Line (tepi_s, 0)-(tepi_s, n1), vbBlack
ElseIf frm_utama.txt_striploat > 0 Then
   frm_utama.input_pic.Line (tepi_s + S_s(100) * 0.1, 0)-(tepi_s, 0), vbRed
   frm_utama.input_pic.Line (tepi_s, 0)-(tepi_s, n1), vbRed
End If
End Sub
'=========================================================================
'                        PLOT TEGANGAN AKIBAT AIR
'=========================================================================
Public Sub plot_W()
Call Plotgambar
Call gaya_air
'Call plot_P
'Call plot_L
Call plot_S
tepi_w = tepi_s + x_smax + 1
frm_utama.input_pic.Line (tepi_w, 0)-(tepi_w, H_air), vbRed
frm_utama.input_pic.Line (tepi_w, H_air)-(tepi_w + Pw * 0.25, 0), vbRed
frm_utama.input_pic.Line (tepi_w, 0)-(tepi_w + Pw * 0.25, 0), vbRed
frm_utama.input_pic.CurrentX = tepi_w
frm_utama.input_pic.CurrentY = 0
frm_utama.input_pic.Print Round(H_air, 3)
End Sub
'=========================================================================
'                        PLOT TEGANGAN KONTAK
'=========================================================================
Public Sub plot_tekon()
Call Plotgambar
Call plot_q
Call DDT
If frm_utama.txt_pload > 0 Then
   Call plot_P
End If
If frm_utama.txt_lineload > 0 Then
   Call plot_L
```

```
End If
If frm_utama.txt_striploat > 0 Then
   Call plot_S
End If
Call plot_W
   frm_utama.input_pic.Line (0, -0.2)-(0, -0.2 - q1 / 20), vbRed
   frm_utama.input_pic.Line (n2, -0.2)-(n2, -0.2 - q2 / 20), vbRed
   frm_utama.input_pic.Line (0, -0.2 - q1 / 20)-(n2, -0.2 - q2 / 20), vbRed
   frm_utama.input_pic.Line (0, -0.2)-(n2, -0.2), vbRed
   frm_utama.input_pic.CurrentX = -1.2
   frm_utama.input_pic.CurrentY = -0.2
   frm_utama.input_pic.Print Round(q1, 3)
   frm_utama.input_pic.CurrentX = n2
   frm_utama.input_pic.CurrentY = -0.2
   frm_utama.input_pic.Print Round(q2, 3)
End Sub
'=========================================================================
'                       PLOT TEGANGAN TOTAL
'=========================================================================
Public Sub plot_tetot()
Call Plotgambar

For i = 1 To 100
   S_l(i) = frm_gayatotal.flextotal.TextMatrix(i, 8) * 0.15
Next i
For i = 1 To 100
   y_l(0) = n1
   x_l(0) = tepi_tanah
   y_l(i) = (1 - (i / 100)) * n1
   x_l(i) = tepi_tanah + (S_l(i) * 2)
   frm_utama.input_pic.Line (x_l(i - 1), y_l(i - 1))-(x_l(i), y_l(i)), vbRed
Next i
frm_utama.input_pic.Line (tepi_tanah + S_l(100) * 2, 0)-(tepi_tanah, 0), vbRed
frm_utama.input_pic.Line (tepi_tanah, 0)-(tepi_tanah, n1), vbRed
End Sub
'=========================================================================
'                       PLOT TANAH DEPAN
'=========================================================================
Public Sub plot_tanahdepan()
Dim posiX As Single
Call input_koordinat
hp = Val(frm_utama.txt_tt)
If frm_utama.opt_1.Value = True Then
   If hp <= n3 Then
      frm_utama.input_pic.Line (-2, hp)-(0, hp), vbYellow
   ElseIf hp > n3 And hp <= (n3 + n9) Then
      posiX = n4 / n9 * (hp - n3)
      frm_utama.input_pic.Line (-2, hp)-(posiX, hp), vbYellow
   ElseIf hp > (n3 + n9) Then
      frm_utama.input_pic.Line (-2, hp)-(n4, hp), vbYellow
   End If
ElseIf frm_utama.opt_2.Value = True Then
```

```
    If hp <= n3 Then
        frm_utama.input_pic.Line (-2, hp)-(0, hp), vbYellow
    ElseIf hp > n3 And hp <= (n1 - n3) Then
        posiX = (n2 - n5 - n6 - n4) / (n1 - n3) * (hp - n3)
        frm_utama.input_pic.Line (-2, hp)-(posiX + n4, hp), vbYellow
    End If
End If
End Sub
```