

BAB VI

KESIMPULAN DAN SARAN

6.1 KESIMPULAN

Berdasarkan analisis dan hasil perhitungan optimasi bentuk dinding batu penahan tanah dengan metoda Algoritma Genetik dapat disimpulkan hal-hal pokok sebagai berikut:

1. Algoritma Genetik yang perumusannya tidak berdasarkan pada matematika terbukti dapat dipakai untuk menyelesaikan masalah optimasi bentuk dinding batu penahan tanah dengan variabel disain adalah lebar kaki dan tumit, lebar kemiringan dinding, lebar puncak, tebal kaki dan tumit.
2. Analisis stabilitas dinding penahan tanah dalam program ini meliputi stabilitas eksternal dan internal, dari uji validasi untuk kasus 1 dan 2 terlihat bahwa dimensi yang dihasilkan program memenuhi stabilitas dinding yang ditunjukkan kendala optimasi sama dengan nol.
3. Optimasi bentuk dinding batu penahan tanah dalam pembuatannya menggunakan metode Algoritma genetik yang berfungsi untuk melakukan proses pengulangan perhitungan jika dimensi yang didapat tidak memenuhi stabilitas dinding penahan tanah, dan untuk menghitung gaya-gaya dari stabilitas dinding tersebut menggunakan teori Coulomb yang memperhitungkan sudut gesek antara dinding penahan dengan tanah.

4. Program optimasi dinding batu penahan tanah setelah dilakukan perbandingan uji validasi, menghasilkan volume yang lebih ekonomis dibandingkan hasil yang dikerjakan tanpa optimasi. Untuk kasus 1 dan 2 volume yang dihasilkan lebih sedikit 40,85% dan 19,25% dibanding perhitungan tanpa optimasi

6.2 SARAN

1. Program ini dapat dikembangkan dengan jumlah lapisan tanah lebih dari lima lapis.
2. Untuk penampilan gambar hasil optimasi dapat dikembangkan dengan menampilkan gambar yang lebih skalatis.
3. Tidak tertutup kemungkinan ditemukan metode lain untuk proses optimasi yang akan memberikan hasil lebih baik dan lebih cepat proses operasinya dibandingkan hasil yang diperoleh memakai metode Algoritma Genetik.
4. Program ini memakai teori Coulomb dalam menghitung tekanan tanah, dan dapat dikembangkan lebih lanjut dengan memakai teori lain.
5. Dinding batu adalah salah satu alternatif dalam pembuatan dinding penahan tanah pada program ini, dan dapat dikembangkan dengan menggunakan bahan lain.

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LAMPIRAN A

Jumlah Individu = 100

Hasil Optimasi

Parameter Hasil Optimasi							
Baris	Iterasi	String Individu	Kendala	Fungsi	Fitness	T Sama	
1	2	101110110110000110	0.75206	7.9175	1.329681	2	
2	3	101110110110100110	0.4622842	8.087501	2.163171	2	
3	4	11011110000101110	0.4161583	7.335001	2.402932	2	
4	5	111110110100100100	0.2174837	7.425	4.598046	2	
5	6	10111111110100100	0.1183325	8.12	8.45076	2	
6							

Dimensi Hasil Optimasi							
Baris	Iterasi	A	B	C	D	E	T2
1	2	0.55	0.55	0.6	0.55	0.3	0.85
2	3	0.55	0.55	0.6	0.55	0.5	0.85
3	4	0.6	0.6	0.6	0.25	0.55	0.85
4	5	0.65	0.55	0.6	0.45	0.5	0.7
5	6	0.55	0.6	0.65	0.55	0.5	0.7
6							

Eksekusi Terbaik							
Baris	Eksekusi	Fitness	Kendala	Fungsi	String Individu	A	
19	1	1.476015E+14	0	6.775	11111111000111000	0.6	
38	2	1.481482E+14	0	6.75	111111110001110000	0.6	
57	3	1.438849E+14	0	6.95	11111101101110000	0.6	
76	4	1.438849E+14	0	6.95	111110110100111000	0.6	
95	5	1.438849E+14	0	6.95	11111101101110000	0.6	
104							

Pilihan Gambar

Manual	Langsung
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4903 : 12.12.2016 02:49 AM
Selesai : 10.12.2016 02:49 AM

Jumlah Individu = 200

Hasil Optimasi						
Optimas						
Parameter Hasil Optimasi						
Basis	Iterasi	String Individu	Kendala	Fungi	Fitness	J.Sama
1	2	101110111100101101	0.356109	7.95	2.808129	2
2	3	101110111100110010	0.2482898	7.43	4.027551	2
3	4	11011111111110101	4.882842E-02	8.690001	20.47988	2
4	5	110110111110100000	3.473124E-02	7.425	28.79252	2
5	6	11111111110011001	0	7.72	1.295337E+14	2

Dimensi Hasil Optimasi						
Basis	Iterasi	A	B	C	D	E
1	2	0.55	0.55	0.65	0.45	0.55
2	3	0.55	0.55	0.65	0.45	0.6
3	4	0.6	0.6	0.65	0.6	0.6
4	5	0.6	0.55	0.65	0.55	0.5
5	6	0.65	0.6	0.65	0.55	0.45

Eksekusi Terbaik						
Basis	Eksekusi	Fitness	Kendala	Fungi	String Individu	A
19	1	1.481482E+14	0	6.75	11111111000110000	0.6
38	2	1.498127E+14	0	6.675	111111101011111000	0.6
57	3	1.498127E+14	0	6.675	111111101011111000	0.6
76	4	1.503759E+14	0	6.65	111111110001111000	0.6
95	5	1.503759E+14	0	6.65	111111110001111000	0.6

Pilihan Gambar	
Manual	Langsung

Jumlah Individu = 300

Hasil Optimasi							
Optimas							
Parameter Hasil Optimasi							
Baris	Iterasi	String Individu	Kendala	Fungs	Fitness	J.Sama	
1	2	100110111101100011	0.5249887	7.63	1.904803	2	
2	3	111100111101110100	0.1859999	7.62	5.376348	2	
3	4	110101111110111011	0.0838391	7.7925	11.92761	2	
4	5	11011111011110000	2.569235E-03	7.5	389.221	2	
5	6	110111110110110000	5.559909E-03	7.35	179.8591	2	

Dimensi Hasil Optimasi							
Baris	Iterasi	A	B	C	D	E	T2
1	2	0.5	0.55	0.65	0.5	0.5	0.65
2	3	0.65	0.45	0.65	0.5	0.6	0.7
3	4	0.6	0.5	0.65	0.55	0.65	0.65
4	5	0.6	0.6	0.6	0.6	0.6	0.5
5	6	0.6	0.6	0.6	0.55	0.6	0.5

Eksekusi Terbaik							
Baris	Eksekusi	Fitness	Kendala	Fungs	String Individu	A	
19	1	1.476015E+14	0	6.775	111110111001111000	0.6	
38	2	1.481482E+14	0	6.75	111111111000110000	0.6	
57	3	1.503759E+14	0	6.65	111111110001111000	0.6	
76	4	1.503759E+14	0	6.65	111111110001111000	0.6	
95	5	1.503759E+14	0	6.65	111111110001111000	0.6	

Pilihan Gambar	Manual	Langsung
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mulai : 2014-03-04 00:00
 selesai : 2014-03-04 00:00

Jumlah Individu = 400

Parameter Hasil Optimasi						
Baris	Iterasi	String Individu	Kendala	Fungsi	Fitness	Sama
1	2	110101101110100000	0.528464	6.725	1.892276	2
2	3	111101111100010110	0.3931721	7.8775	2.543416	2
3	4	110110111101100010	0.1398299	7.555	7.151546	2
4	5	11011110110111010	2.321341E-02	7.675	43.07855	2
5	6	1111011111111000	0	7.675	1.302932E+14	2

Dimensi Hasil Optimasi							
Baris	Iterasi	A	B	C	D	E	T2
1	2	0.6	0.5	0.55	0.55	0.5	0.5
2	3	0.65	0.5	0.65	0.45	0.4	0.85
3	4	0.6	0.55	0.65	0.5	0.5	0.6
4	5	0.6	0.6	0.6	0.55	0.65	0.6
5	6	0.65	0.55	0.65	0.6	0.65	0.5

Eksekusi Terbaik						
Baris	Eksekusi	Fitness	Kendala	Fungsi	String Individu	A
19	1	1.498127E+14	0	6.675	11111101011111000	0.6
38	2	1.503759E+14	0	6.65	11111110001111000	0.6
57	3	1.503759E+14	0	6.65	1111111100011111000	0.6
76	4	1.503759E+14	0	6.65	1111111100011111000	0.6
95	5	1.503759E+14	0	6.65	1111111100011111000	0.6

Pilihan Gambar

Manual	Langsung
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Jumlah Individu = 450

Hasil Optimasi

Optimasi

Parameter Hasil Optimasi

Baris	Iterasi	String Individu	Kendala	Fungsi	Fitness	J.Sama
1	2	111111101011111000	0	6.675	1.498127E+14	2
2	3	111111101011111000	0	6.675	1.498127E+14	4
3	4	110101111101100010	0.3094648	7.4	3.231385	2
4	5	101110111101100011	0.3396668	7.6625	2.944062	2
5	6	111110110011111001	7.89088E-03	6.9425	126.7286	2

Dimensi Hasil Optimasi

Baris	Iterasi	A	B	C	D	E	T2
1	2	0.65	0.6	0.55	0.4	0.65	0.5
2	3	0.65	0.6	0.55	0.4	0.65	0.5
3	4	0.6	0.5	0.65	0.5	0.5	0.6
4	5	0.55	0.55	0.65	0.5	0.5	0.65
5	6	0.65	0.55	0.6	0.4	0.65	0.55

Eksekusi Terbaik

Baris	Eksekusi	Fitness	Kendala	Fungsi	String Individu	A
19	1	1.503759E+14	0	6.65	11111110001111000	0.6
38	2	1.503759E+14	0	6.65	11111110001111000	0.6
57	3	1.503759E+14	0	6.65	11111110001111000	0.6
76	4	1.503759E+14	0	6.65	11111110001111000	0.6
95	5	1.503759E+14	0	6.65	11111110001111000	0.6

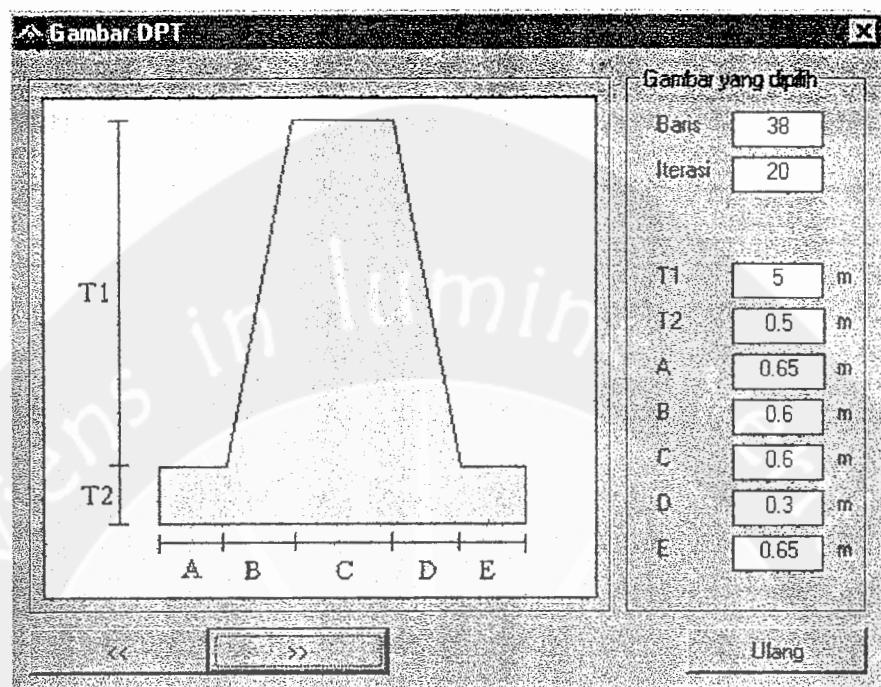
Pilihan Gambar

Manual Langsung

Hasil Optimal

Hasil Optimal

Hasil *Output* gambar program



Tanah Lapis 1

```

Optimasi
Sub Optimasi()
Randomize Timer
xx = 1
jj = 1
JDD = 8
JVar = 6
Rr = Poptimasi.Rr.Text
PROSENMATI = 10
stringBest = " "
fitnessbest = 0#
JlhEks = Poptimasi.JlhEks
IterasiIjin = Poptimasi.IterasiIjin.Text
JIND = Poptimasi.JIND.Text
baris = 0
Hasil.ProgressBar1.Visible = True
Hasil.ProgressBar1.Min = 1
Hasil.ProgressBar1.Max = JlhEks
Hasil.ProgressBar2.Visible = True
Hasil.ProgressBar2.Min = 0
Hasil.ProgressBar2.Max = IterasiIjin
For ZEks = 1 To JlhEks
'String Individu'
    Btsbwh = 0
    Btsats = JDD - 1
    For i = 1 To JIND
        For k = 1 To JVar
            nilai = Btsbwh + Int(Rnd * (Btsats - Btsbwh))
            NOVD(k) = nilai
            Bin = ""
            Xz = Val(NoVD(k))
            For j = 2 To 0 Step -1
                If Xz And (2 ^ j) Then
                    Bin = Bin + "1"
                Else
                    Bin = Bin + "0"
                End If
            Next j
            VD(k) = Bin
        Next k
        strIND(i) = ""
        For k = 1 To JVar
            strIND(i) = strIND(i) + VD(k)
            pjstrIND = Len(strIND(i))
        Next k
    Next i
'Proses Iterasi Optimasi'
    konver = "belum"
    iterasi = 1
    Do While (konver = "belum")
        baris = baris + 1
        Hasil.ProgressBar2.Value = iterasi
        '-----Ibu-----'
        ibul = Left(strU(i), lokasi1(i))

```

```
iterasi = iterasi + 1
```

```

For i = 1 To JIND
jodoh(i) = 0
Next i
```

```
'Cari jodoh'
```

```

For i = 1 To JIND
If jodoh(i) = 0 Then IHASIL = i
Do While (IHASIL = i)
IBANTU = 1 + Int(Rnd * JIND)
IADA = 0
If IBANTU = i Then
IADA = IADA + 1
Else
For j = 1 To JIND
If IBANTU = jodoh(j) Then
IADA = IADA + 1
End If
Next j
End If
If IADA = 0 Then IHASIL = IBANTU
jodoh(i) = IHASIL
jodoh(IHASIL) = i
```

```
Loop
```

```
strU(i) = strIND(jodoh(i))
```

```
Next i
```

```
'Kawin Silang'
```

```

For i = 1 To JIND
IUJI = 1 + Int(Rnd * (pjstrIND - 1))
lokasi1(i) = IUJI
lokasi1(jodoh(i)) = IUJI
ao = 0
Do While (ao = 0)
IPROD = 1 + Int(Rnd * (pjstrIND - 1))
lokasi2(i) = IPROD
lokasi2(jodoh(i)) = IPROD
If lokasi1(i) <> lokasi2(i) Then ao = 1
Loop
```

```
Next i
```

```
For i = 1 To JIND
```

```
If lokasi1(i) > lokasi2(i) Then
temp1 = lokasi2(i)
lokasi2(i) = lokasi1(i)
lokasi1(i) = temp1
```

```
End If
```

```
'-----Bapak-----'
```

```
Bapak1 = Left(strIND(i), lokasi1(i))
Bapak2 = Mid(strIND(i), lokasi1(i) + 1,
lokasi2(i) - lokasi1(i))
Bapak3 = Right(strIND(i), pjstrIND -
lokasi2(i))
```

```
For Li = 3 To 1 Step -1
```

```
If Fe(Li) = "1" Then
```

```

ibu2 = Mid(strU(i), lokasi1(i) + 1, lokasi2(i) -
lokasi1(i))
ibu3 = Right(strU(i), pjstrIND - lokasi2(i))

'-----Anak-----'
strIND(i) = Bapak1 + ibu2 + Bapak3
strIND(IHASIL) = ibu1 + Bapak2 + ibu3
Next i
'Generasi 1'
For iIndiv = 1 To JIND
iAwal = 1
strA = Mid(strIND(iIndiv), iAwal, 3)
strB = Mid(strIND(iIndiv), iAwal + 3, 3)
strC = Mid(strIND(iIndiv), iAwal + 6, 3)
strD = Mid(strIND(iIndiv), iAwal + 9, 3)
strE = Mid(strIND(iIndiv), iAwal + 12, 3)
strT2 = Mid(strIND(iIndiv), iAwal + 15, 3)
iAwal = iAwal + 18

'Dimensi A"
decA = 0
For Li = 1 To 3
    Na(Li) = Mid(strA, Li, 1)
Next Li
For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
Next Li
For Li = 3 To 1 Step -1
    If Fe(Li) = "1" Then
        decA = decA + (2 ^ (Li - 1))
    End If
Next Li

'Dimensi B"
decB = 0
For Li = 1 To 3
    Na(Li) = Mid(strB, Li, 1)
Next Li
For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
Next Li
For Li = 3 To 1 Step -1
    If Fe(Li) = "1" Then
        decB = decB + (2 ^ (Li - 1))
    End If
Next Li

'Dimensi C"
decC = 0
For Li = 1 To 3
    Na(Li) = Mid(strC, Li, 1)
Next Li
For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
Next Li
A = AA(decA)

decC = decC + (2 ^ (Li - 1))
End If
Next Li

'Dimensi D"
decD = 0
For Li = 1 To 3
    Na(Li) = Mid(strD, Li, 1)
Next Li
For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
Next Li
For Li = 3 To 1 Step -1
    If Fe(Li) = "1" Then
        decD = decD + (2 ^ (Li - 1))
    End If
Next Li

'Dimensi E"
decE = 0
For Li = 1 To 3
    Na(Li) = Mid(strE, Li, 1)
Next Li
For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
Next Li
For Li = 3 To 1 Step -1
    If Fe(Li) = "1" Then
        decE = decE + (2 ^ (Li - 1))
    End If
Next Li

'DimensiT2'
decT2 = 0
For Li = 1 To 3
    Na(Li) = Mid(strT2, Li, 1)
Next Li
For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
Next Li
For Li = 3 To 1 Step -1
    If Fe(Li) = "1" Then
        decT2 = decT2 + (2 ^ (Li - 1))
    End If
Next Li
DimensiA
DimensiB
DimensiC
DimensiD
DimensiE
DimensiT2

Else
gg6(iIndiv) = g6(iIndiv)

```

```

B = BB(decB)
C = CC(decC)
D = DD(decD)
E = EE(decE)
T2 = TT2(decT2)
GammaLn
Parameter
If Option1.Value = True Then Basah
If Option2.Value = True Then Kering
BrtBangunan
Stabilitas

g1(iIndiv) = Eks
g2(iIndiv) = Guling
g3(iIndiv) = Geser
g4(iIndiv) = Dukungmax
g5(iIndiv) = Dukungmin
g6(iIndiv) = Eksi
g7(iIndiv) = Desaki
g8(iIndiv) = Tariki
g9(iIndiv) = Geseri

If g1(iIndiv) < 0 Then
  gg1(iIndiv) = 0
Else
  gg1(iIndiv) = g1(iIndiv)
End If

If g2(iIndiv) >= 0 Then
  gg2(iIndiv) = 0
Else
  gg2(iIndiv) = g2(iIndiv)
End If

If g3(iIndiv) >= 0 Then
  gg3(iIndiv) = 0
Else
  gg3(iIndiv) = g3(iIndiv)
End If

If g4(iIndiv) < 0 Then
  gg4(iIndiv) = 0
Else
  gg4(iIndiv) = g4(iIndiv)
End If

If g5(iIndiv) > 0 Then
  gg5(iIndiv) = 0
Else
  gg5(iIndiv) = g5(iIndiv)
End If

If g6(iIndiv) < 0 Then
  gg6(iIndiv) = 0
'Urut Kecil Besar'
End If

End If

If g7(iIndiv) <= 0 Then
  gg7(iIndiv) = 0
Else
  gg7(iIndiv) = g7(iIndiv)
End If

If g8(iIndiv) <= 0 Then
  gg8(iIndiv) = 0
Else
  gg8(iIndiv) = g8(iIndiv)
End If

If g9(iIndiv) <= 0 Then
  gg9(iIndiv) = 0
Else
  gg9(iIndiv) = g9(iIndiv)
End If

Kendalag(iIndiv) = Abs(gg1(iIndiv)) +
Abs(gg2(iIndiv)) + Abs(gg3(iIndiv)) +
Abs(gg4(iIndiv)) + Abs(gg5(iIndiv)) +
Abs(gg6(iIndiv)) + Abs(gg7(iIndiv)) +
Abs(gg8(iIndiv)) + Abs(gg9(iIndiv))

Fungsi(iIndiv) = (T1 * (C + (D / 2) + (B / 2))) +
(T2 * (A + B + C + D + E))
fitness(iIndiv) = 1E+15 /
(Fungsi(iIndiv) + (Rr * Kendalag(iIndiv)))

kendalaindiv(iIndiv) = 0
Fungsindiv(iIndiv) = 0
fitnessindiv(iIndiv) = 0

kendalaindiv(iIndiv) = kendalaindiv(iIndiv) +
Kendalag(iIndiv)
Fungsindiv(iIndiv) = Fungsindiv(iIndiv) +
Fungsi(iIndiv)
fitnessindiv(iIndiv) = fitnessindiv(iIndiv) +
fitness(iIndiv)
Next iIndiv

Next Li
For Li = 3 To 1 Step -1

```

```

For i = 1 To JIND
  For j = i + 1 To JIND
    If (fitnessindiv(i) < fitnessindiv(j)) Then
      temp = fitnessindiv(i)
      tempStr = strIND(i)
      fitnessindiv(i) = fitnessindiv(j)
      strIND(i) = strIND(j)
      fitnessindiv(j) = temp
      strIND(j) = tempStr
    End If
    Next j
  Next i

  'Seleksi Alam'
  JLHGANTI = Int(PROSENMATI * JIND / 100)
  If (JLHGANTI < 1) Then JLHGANTI = 1
  NOMATI = JIND + 1
  NOHIDUP = 0
  For JLHGANTI = 1 To JLHGANTI
    NOMATI = NOMATI - 1
    NOHIDUP = NOHIDUP + 1
    fitnessindiv(NOMATI) =
    fitnessindiv(NoHIDUP)
    strIND(NOMATI) = strIND(NoHIDUP)
  Next JLHGANTI

  'Hitung Indiv Best'
  jlhSama = 1
  For i = 2 To JIND
    If strIND(1) = strIND(i) Then jlhSama =
    jlhSama + 1
  Next i

  'Generasi Selanjutnya'
  For iIndiv = 1 To JIND
    iAwal = 1
    strA = Mid(strIND(iIndiv), iAwal, 3)
    strB = Mid(strIND(iIndiv), iAwal + 3, 3)
    strC = Mid(strIND(iIndiv), iAwal + 6, 3)
    strD = Mid(strIND(iIndiv), iAwal + 9, 3)
    strE = Mid(strIND(iIndiv), iAwal + 12,
3)
    strT2 = Mid(strIND(iIndiv), iAwal + 15,
3)
    iAwal = iAwal + 18

    'Dimensi A'
    decA = 0
    For Li = 1 To 3
      Na(Li) = Mid(strA, Li, 1)
    Next Li
    For Li = 1 To 3
      Fe(Li) = Na(4 - Li)
    Next Li

    If Fe(Li) = "1" Then
      decA = decA + (2 ^ (Li - 1))
    End If
    Next Li

    'Dimensi B'
    decB = 0
    For Li = 1 To 3
      Na(Li) = Mid(strB, Li, 1)
    Next Li
    For Li = 1 To 3
      Fe(Li) = Na(4 - Li)
    Next Li
    For Li = 3 To 1 Step -1
      If Fe(Li) = "1" Then
        decB = decB + (2 ^ (Li - 1))
      End If
    Next Li

    'Dimensi C'
    decC = 0
    For Li = 1 To 3
      Na(Li) = Mid(strC, Li, 1)
    Next Li
    For Li = 1 To 3
      Fe(Li) = Na(4 - Li)
    Next Li
    For Li = 3 To 1 Step -1
      If Fe(Li) = "1" Then
        decC = decC + (2 ^ (Li - 1))
      End If
    Next Li

    'Dimensi D'
    decD = 0
    For Li = 1 To 3
      Na(Li) = Mid(strD, Li, 1)
    Next Li
    For Li = 1 To 3
      Fe(Li) = Na(4 - Li)
    Next Li
    For Li = 3 To 1 Step -1
      If Fe(Li) = "1" Then
        decD = decD + (2 ^ (Li - 1))
      End If
    Next Li

    'Dimensi E'
    decE = 0
    For Li = 1 To 3
      Na(Li) = Mid(strE, Li, 1)
    Next Li
    For Li = 1 To 3
      Fe(Li) = Na(4 - Li)
    Else
      gg2(iIndiv) = g2(iIndiv)
    End If
  Next iIndiv

```

```

For Li = 3 To 1 Step -1
  If Fe(Li) = "1" Then
    decE = decE + (2 ^ (Li - 1))
  End If
  Next Li
  'DimensiT2'
  decT2 = 0
  For Li = 1 To 3
    Na(Li) = Mid(strT2, Li, 1)
  Next Li
  For Li = 1 To 3
    Fe(Li) = Na(4 - Li)
  Next Li
  For Li = 3 To 1 Step -1
    If Fe(Li) = "1" Then
      decT2 = decT2 + (2 ^ (Li - 1))
    End If
  Next Li

  Call DimensiA
  Call DimensiB
  Call DimensiC
  Call DimensiD
  Call DimensiE
  Call DimensiT2
  A = AA(decA)
  B = BB(decB)
  C = CC(decC)
  D = DD(decD)
  E = EE(decE)
  T2 = TT2(decT2)
  Parameter
  If Option1.Value = True Then Basah
  If Option2.Value = True Then Kering
  BrtBangunan
  Stabilitas
  g1(iIndiv) = Eks
  g2(iIndiv) = Guling
  g3(iIndiv) = Geser
  g4(iIndiv) = Dukungmax
  g5(iIndiv) = Dukungmin
  g6(iIndiv) = Eksi
  g7(iIndiv) = Desaki
  g8(iIndiv) = Tariki
  g9(iIndiv) = Geseri

  If g1(iIndiv) < 0 Then
    gg1(iIndiv) = 0
  Else
    gg1(iIndiv) = g1(iIndiv)
  End If

  If g2(iIndiv) >= 0 Then
    gg2(iIndiv) = 0
  End If

  End If

  If g3(iIndiv) >= 0 Then
    gg3(iIndiv) = 0
  Else
    gg3(iIndiv) = g3(iIndiv)
  End If

  If g4(iIndiv) < 0 Then
    gg4(iIndiv) = 0
  Else
    gg4(iIndiv) = g4(iIndiv)
  End If

  If g5(iIndiv) > 0 Then
    gg5(iIndiv) = 0
  Else
    gg5(iIndiv) = g5(iIndiv)
  End If

  If g6(iIndiv) < 0 Then
    gg6(iIndiv) = 0
  Else
    gg6(iIndiv) = g6(iIndiv)
  End If

  If g7(iIndiv) <= 0 Then
    gg7(iIndiv) = 0
  Else
    gg7(iIndiv) = g7(iIndiv)
  End If

  If g8(iIndiv) <= 0 Then
    gg8(iIndiv) = 0
  Else
    gg8(iIndiv) = g8(iIndiv)
  End If

  If g9(iIndiv) <= 0 Then
    gg9(iIndiv) = 0
  Else
    gg9(iIndiv) = g9(iIndiv)
  End If

  Kendalag(iIndiv) = Abs(gg1(iIndiv)) +
  Abs(gg2(iIndiv)) + Abs(gg3(iIndiv)) +
  Abs(gg4(iIndiv)) + Abs(gg5(iIndiv)) +
  Abs(gg6(iIndiv)) + Abs(gg7(iIndiv)) +
  Abs(gg8(iIndiv)) + Abs(gg9(iIndiv))
  Fungsi(iIndiv) = (T1 * (C + (D / 2) + (B /
  2))) + (T2 * (A + B + C + D + E))
  fitness(iIndiv) = 1E+15 / (Fungsi(iIndiv))
  + (Rr * Kendalag(iIndiv)))
  .CellAlignment = 4
  .Text = BB(decB)

```

```

kendalaindiv(iIndiv) = 0
Fungsindiv(iIndiv) = 0
fitnessindiv(iIndiv) = 0

kendalaindiv(iIndiv) =
kendalaindiv(iIndiv) + Kendalag(iIndiv)
Fungsindiv(ilndiv) = Fungsindiv(iIndiv)
+ Fungsi(iIndiv)
fitnessindiv(ilndiv) = fitnessindiv(iIndiv)
+ fitness(iIndiv)

Hasil.Label5.Caption = iterasi
'Tampilan Flexgrid'
With Hasil.MSFlexGrid1
.Row = baris
.Col = 0
.CellAlignment = 4
.Text = baris
.Col = 1
.CellAlignment = 4
.Text = iterasi
.Col = 2
.CellAlignment = 4
.Text = strIND(1)
.Col = 3
.CellAlignment = 4
.Text = Kendalag(iIndiv)
.Col = 4
.CellAlignment = 4
.Text = Fungsi(iIndiv)
.Col = 5
.CellAlignment = 4
.Text = fitness(iIndiv)
.Col = 6
.CellAlignment = 4
.Text = jlhSama
.Col = 7
.CellAlignment = 4
.Text = ZEks
.Rows = Hasil.MSFlexGrid1.Rows + 1
End With

Next iIndiv
With Hasil.MSFlexGrid1
For k = 2 To JIND
.Rows = Hasil.MSFlexGrid1.Rows - 1
Next k
End With
With Hasil.MSFlexGrid2
For k = 2 To JIND
.Rows = Hasil.MSFlexGrid2.Rows - 1
Next k
End With

'Check Konvergen'
If jlhSama >= 0.9 * JIND Then konver =
"sudah"
If iterasi = IterasiIjin Then konver =
"sudah"
Loop
With Hasil.MSFlexGrid3
.Row = ZEks
.Col = 0
.CellAlignment = 4
.Text = ZEks
.Col = 1
.CellAlignment = 4
.Text = fitnessindiv(1)
.Col = 2
.CellAlignment = 4
.Text = kendalaindiv(1)
.Col = 3
.CellAlignment = 4
.Text = Fungsindiv(1)
.Col = 4
.CellAlignment = 4
.Text = strIND(1)
.Col = 5
.CellAlignment = 4
.Text = AA(decA)
.Col = 6
.Col = 8
.CellFontBold = True

```

```

H1 = Text3.Text
Delta1 = Text4.Text
If D = 0 Then
  alfa = 0
Else
  alfa = (Atn(T1 / D)) * (180 * (7 / 22))
End If
lamda = (180 - (90 + alfa))
L = (A + B + C + D + E)
Lt = ((T1 ^ 2) + (D ^ 2)) ^ (0.5)
Ht = T1 + T2
L1 = (H1 / (Cos(lamda / (180 * 7 / 22))))
Ka1 = ((Sin((alfa + Phi1) / (180 * 7 / 22))) ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) * (Sin((alfa - Delta1) / (180 * 7 / 22))) * (1 + (((((Sin((Phi1 + Delta1) / (180 * 7 / 22))) * (Sin(Phi1 / (180 * 7 / 22))) / ((Sin((alfa - Delta1) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 / 22)))) ^ 0.5)) ^ 2)))
Kp = (((Sin((alfa - Phi1) / (180 * 7 / 22))) ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) * (Sin((alfa + Delta1) / (180 * 7 / 22))) * (1 - (((((Sin((Phi1 + Delta1) / (180 * 7 / 22))) * (Sin(Phi1 / (180 * 7 / 22))) / ((Sin((alfa + Delta1) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 / 22)))) ^ 0.5)) ^ 2)))
End Sub
Sub Basah()
'On Error Resume Next
  da = (((H1 - Hw1) * D) / T1)
  Hw1 = H1 - (Ht - Hwt)
  Lw1 = (Hw1 / (Cos(lamda * (180 * 7 / 22))))
'Tekanan Pasif
  Epp = 0.5 * (T2) ^ 2 * Gal * Kp
  Cp = T2 * 2 * Ch1 * ((Kp) ^ 0.5)
  Ppair = 0.5 * (T2) ^ 2 * Gw
  Mep = Ep * (T2 / 3)
  Mcp = Cp * (T2 / 2)
  Mpair = Ppair * (T2 / 3)
  Mpp = Mep + Mcp + Mair
  Ep = Epp + Cp + Ppair
  If Hwt = Ht Then
    'Gaya Eksternal'
    'Beban Merata Q'
    Do While QQ < 0
      Eq1 = (Q * L1) * Kal
      Eq2 = (Q + L1 * Gal) * T2 * Kal
      Eq1H = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Eq1
      Eq2V = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Eq2
      Mc1V = C1Vi * (B + C + (D / 2))
      Mc2H = C2H * (T2 / 2)
      Mc1V = C1V * (A + B + C + (D / 2))
      Mc2V = C2V * (L)
      JEaV = Ea1V + Ea2V + Ea3V
      JEaH = Ea1H + Ea2H + Ea3H
      JMaH = Ma1H + Ma2H + Ma3H
      JMaV = Ma1V + Ma2V + Ma3V
      JMCH = Mc1H + Mc2H
      JMCV = Mc1V + Mc2V
      EaV = (JEqV + JEaV) - JCV + PairV
      Ea = (JEqH + JEaH) - JCH + PairH
      MaV = (JEqV + JMaV) - JMVC + MairV
      Ma = (JEqH + JMaH) - JMCH + MairH
      'Gaya Internal'
      'Beban Merata Q'
      QQ = Q
      Do While QQ < 0
        Eq1i = (Q * L1) * Ka1
        Eq1Hi = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Eq1i
        Eq1Vi = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Eq1i
        Mq1Hi = Eq1Hi * (H1 / 2)
        Mq1Vi = Eq1Vi * (B + C + (D / 2))
        QQ = 0
      Loop
      'Beban Tanah'
      Eali = 0.5 * L1 ^ 2 * Gal * Kal
      EalHi = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Eali
      EalVi = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Eali
      MalHi = EalHi * (H1 / 3)
      MalVi = EalVi * (B + C + ((1 / 3) * D))
      'Beban Air'
      Pairi = 0.5 * (L1) ^ 2 * Gw
      PairHi = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Pairi
      PairVi = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Pairi
      MairHi = PairHi * (Hwt / 3)
      MairVi = PairVi * (B + C + ((1 / 3) * D))
      'Cohesi'
      C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
      C1Hi = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * C1i
      C1Vi = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * C1i
      Mc1Hi = C1Hi * (H1 / 2)
      'Beban Tanah'
      Eal = 0.5 * (L1 - Lw1) ^ 2 * Gb1 * Kal
    End If
  End Sub

```

```

JEqHi = Eq1Hi
JEqVi = Eq1Vi
JMqHi = Mq1Hi
JMqVi = Mq1Vi
JEaVi = Ea1Vi
JEaHi = Ea1Hi
JMaHi = Ma1Hi
JMaVi = Ma1Vi
JCHi = C1Hi
JCVi = C1Vi
JMCHi = Mc1Hi
JMCVi = Mc1Vi

EaVi = (JEqVi + JEaVi) - JCVi + PairVi
Eai = (JEqHi + JEaHi) - JCHi + PairHi
MaVi = (JMqVi + JMaVi) - JMCVi +
MairVi
Mai = (JMqHi + JMaHi) - JMCHi + MairHi

ElseIf Hwt > T2 And Hwt < Ht Then
'Gaya Eksternal'
'Beban Merata Q'
QQ = Q
Do While QQ < 0
Eq1 = Q * (L1 - Lw1) * Ka1
Eq2 = (Q + (L1 - Lw1) * Gb1) * Lw1 *
Ka1
Eq3 = (Q + (L1 - Lw1) * Gb1 + Lw1 *
Ga1) * T2 * Ka1
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq3H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq3
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq3V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq3
QQ = 0
Loop
JEqH = Eq1H + Eq2H + Eq3H
JEqV = Eq1V + Eq2V + Eq3V
Mq1H = Eq1H * ((H1 - Hw1) / 2) + T2
Mq2H = Eq2H * (Hw1 / 2) + T2
Mq3H = Eq3H * (T2 / 2)
Mq1V = Eq1V * (A + B + C + (da / 2))
Mq2V = Eq2V * (A + B + C + (D / 2))
Mq3V = Eq3V * (L)
JMqH = Mq1H + Mq2H + Mq3H
JMqV = Mq1V + Mq2V + Mq3V

Ea2 = ((L1 - Lw1) * Gb1 * Ka1) * Lw1
Ea3 = 0.5 * (Lw1) ^ 2 * Ga1 * Ka1
Ea4 = ((L1 - Lw1) * Gb1 + Lw1 * Ga1) *
Ka1 * T2
Ea5 = 0.5 * (T2) ^ 2 * Ga1 * Ka1
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
Ea4H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea4
Ea5H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea5
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
Ea4V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea4
Ea5V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea5
JEaV = Ea1V + Ea2V + Ea3V + Ea4V +
Ea5V
JEaH = Ea1H + Ea2H + Ea3H + Ea4H +
Ea5H
Ma1H = Ea1H * ((H1 - Hw1) / 3) + T2
Ma2H = Ea2H * (Hw1 / 2) + T2
Ma3H = Ea3H * (Hw1 / 3) + T2
Ma4H = Ea4H * (T2 / 3)
Ma5H = Ea5H * (T2 / 3)
Ma1V = Ea1V * (A + B + C + ((1 / 3) *
da))
Ma2V = Ea2V * (A + B + C + (D / 2))
Ma3V = Ea3V * (A + B + C + ((1 / 3) * D))
Ma4V = Ea4V * (L)
Ma5V = Ea5V * (L)
JMaH = Ma1H + Ma2H + Ma3H + Ma4H
+ Ma5H
JMaV = Ma1V + Ma2V + Ma3V + Ma4V
+ Ma5V

'Beban Air'
Pair = 0.5 * (Lw1 + T2) ^ 2 * Gw
PairH = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Pair
PairV = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Pair
MairH = PairH * (Hwt / 3)
MairV = PairV * (L)
Ea3Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea3i

```

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = T2 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C2$
 $C1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C2$

$Mc1H = C1H * (H1 / 2) + T2$
 $Mc2H = C2H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (D / 2))$
 $Mc2V = C2V * (L)$
 $JMCH = Mc1H + Mc2H$
 $JMCV = Mc1V + Mc2V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Internal'
'Beban Merata Q'
 $QQ = Q$
Do While $QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + (L1 - Lw1) * Gb1) * Lw1 * Ka1$
 $Eq1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Mq1Hi = Eq1Hi * (((H1 - Hw1) / 2) + Hw1)$
 $Mq2Hi = Eq2Hi * (Hw1 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (da / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (D / 2))$
 $QQ = 0$
Loop
'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Ga1 * Ka1$
 $Ea2i = (((L1 - Lw1) * Gb1) * Ka1) * Lw1$
 $Ea3i = 0.5 * (Lw1) ^ 2 * Ga1 * Ka1$
 $Ea1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $QQ = Q$

$Ea1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ma1Hi = Ea1Hi * (((H1 - Hw1) / 3) + Hw1)$
 $Ma2Hi = Ea2Hi * (Hw1 / 2)$
 $Ma3Hi = Ea3Hi * (Hw1 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * da))$
 $Ma2Vi = Ea2Vi * (B + C + (D / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * D))$

'Beban Air'
 $Pairi = 0.5 * (Lw1) ^ 2 * Gw$
 $PairHi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Pairi$
 $PairVi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $Mc1Hi = C1H * (H1 / 2)$
 $Mc1Vi = C1V * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi$
 $JEqVi = Eq1Vi + Eq2Vi$
 $JMqHi = Mq1Hi + Mq2Hi$
 $JMqVi = Mq1Vi + Mq2Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi$
 $JMaVi = Ma1Vi + Ma2Vi + Ma3Vi$
 $JCHi = C1Hi$
 $JCVi = C1Vi$
 $JMCHi = Mc1Hi$
 $JMCVi = Mc1Vi$

$EaVi = (JEqVi + JEaVi) - JCVi + PairVi$
 $Eai = (JEqHi + JEaHi) - JCHi + PairHi$
 $MaVi = (JMqVi + JMaVi) - JMCVi + MairVi$
 $Mai = (JMqHi + JMaHi) - JMCHi + MairHi$

ElseIf $Hwt = T2$ And $Hwt < Ht$ Then
'Gaya Eksternal'
'Beban Merata Q'

```

Do While QQ <> 0
Eq1 = (Q * L1) * Kal
Eq2 = (Q + L1 * Gal) * T2 * Kal
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
QQ = 0
Loop
JEqH = Eq1H + Eq2H
JEqV = Eq1V + Eq2V
Mq1H = Ea1H * (H1 / 2) + T2
Mq2H = Ea2H * (T2 / 2)
Mq1V = Ea1V * (A + B + C + (D / 2))
Mq2V = Ea2V * (L)
JMqH = Mq1H + Mq2H
JMqV = Mq1V + Mq2V

'Beban Tanah'
Ea1 = 0.5 * (L1) ^ 2 * Gal * Kal
Ea2 = ((L1 * Gal) * Kal) * T2
Ea3 = 0.5 * (T2) ^ 2 * Gal * Kal
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
JEaV = Ea1V + Ea2V + Ea3V
JEaH = Ea1H + Ea2H + Ea3H
Ma1H = Ea1H * (H1 / 3) + T2
Ma2H = Ea2H * (T2 / 2)
Ma3H = Ea3H * (T2 / 3)
Ma1V = Ea1V * (A + B + C + ((1 / 3) * D))
Ma2V = Ea2V * (L)
Ma3V = Ea3V * (L)
JMaH = Ma1H + Ma2H + Ma3H
JMaV = Ma1V + Ma2V + Ma3V

'Beban Air'
Pair = 0.5 * (L1 + T2) ^ 2 * Gw
PairH = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Pair
PairV = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Pair
MairH = PairH * (Hwt / 3)
MairV = PairV * (L)
Mc1Hi = C1H * (H1 / 2)
Mc1Vi = C1V * (B + C + ((D / 2)))
'Cohesi Tanah'
C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C2 = T2 * 2 * Ch1 * ((Ka1) ^ 0.5)
C1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1
C2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C2
C1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1
C2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C2
Mc1H = C1H * (H1 / 2) + T2
Mc2H = C2H * (T2 / 2)
Mc1V = C1V * (A + B + C + (D / 2))
Mc2V = C2V * (L)
JCH = C1H + C2H
JCV = C1V + C2V
JMCH = Mc1H + Mc2H
JMCV = Mc1V + Mc2V

EaV = (JEqV + JEaV) - JCV
Ea = (JEqH + JEaH) - JCH
MaV = (JMqV + JMaV) - JMCV
Ma = (JMqH + JMaH) - JMCH

'Gaya Internal'
'Beban Merata'
QQ = Q
Do While QQ <> 0
Eq1i = (Q * L1) * Kal
Eq1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Eq1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Mq1Hi = Eq1Hi * (H1 / 2)
Mq1Vi = Eq1Vi * (B + C + (D / 2))
QQ = 0
Loop
'Beban Tanah'
Eali = 0.5 * L1 ^ 2 * Gal * Kal
Ea1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eali
Ea1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eali
Ma1Hi = Eali * (H1 / 3)
Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * D))

'Cohesi'
C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1i
'Beban Tanah'
Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Kal

```

```

JEqHi = Eq1Hi
JEqVi = Eq1Vi
JMqHi = Mq1Hi
JMqVi = Mq1Vi
JEaVi = Ea1Vi
JEaHi = Ea1Hi
JMaHi = Ma1Hi
JMaVi = Ma1Vi
JCHi = C1Hi
JCVi = C1Vi
JMCHi = Mc1Hi
JMCVi = Mc1Vi

EaVi = (JEqVi + JEaVi) - JCVi
Eai = (JEqHi + JEaHi) - JCHi
MaVi = (JMqVi + JMaVi) - JMCVi
Mai = (JMqHi + JMaHi) - JMCHi

ElseIf Hwt < T2 Then
'Gaya Eksternal'
'Beban Merata Q'
QQ = Q
Do While QQ < 0
Eq1 = (Q * L1) * Ka1
Eq2 = (Q + L1 * Gb1) * (T2 - Lw1) * Ka1
Eq3 = (Q + L1 * Gb1 + (T2 - Lw1) * Ga1) *
*Lw1 * Ka1
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq3H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq3
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq3V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq3
Mq1H = Eq1H * (H1 / 2) + T2
Mq2H = Eq2H * (((T2 - Hw1) / 2) + Hw1)
Mq3H = Eq3H * (Hw1 / 2)
Mq1V = Eq1V * (A + B + C + (D / 2))
Mq2V = Eq2V * (L)
Mq3V = Eq3V * (L)
QQ = 0
Loop

JEqH = Eq1H + Eq2H + Eq3H
JEqV = Eq1V + Eq2V + Eq3V
JMqH = Mq1H + Mq2H + Mq3H
JMqV = Mq1V + Mq2V + Mq3V

'Cohesi Tanah'

Ea2 = ((L1 * Gb1) * Ka2) * (T2 - Lw1)
Ea3 = 0.5 * (T2 - Lw1) ^ 2 * Gb1 * Ka1
Ea4 = ((L1 * Gb1 + (T2 - Lw1) * Ga1) *
Ka1) * Lw1
Ea5 = 0.5 * (Lw1) ^ 2 * Ga1 * Ka1
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
Ea4H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea4
Ea5H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea5
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
Ea4V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea4
Ea5V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea5
Ma1H = Ea1H * ((H1 / 3) + T2)
Ma2H = Ea2H * (((T2 - Hw1) / 2) + Hw1)
Ma3H = Ea3H * (((T2 - Hw1) / 3) + Hw1)
Ma4H = Ea4H * (Hw1 / 2)
Ma5H = Ea5H * (Hw1 / 3)
Ma1V = Ea1V * (A + B + C + ((1 / 3) * D))
Ma2V = Ea2V * (L)
Ma3V = Ea3V * (L)
Ma4V = Ea4V * (L)
Ma5V = Ea5V * (L)
JEaV = Ea1V + Ea2V + Ea3V + Ea4V +
Ea5V
JEaH = Ea1H + Ea2H + Ea3H + Ea4H +
Ea5H
JMaH = Ma1H + Ma2H + Ma3H + Ma4H +
Ma5H
JMaV = Ma1V + Ma2V + Ma3V + Ma4V +
Ma5V

'Beban Air'
Pair = 0.5 * (Lw1) ^ 2 * Gw
PairH = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Pair
PairV = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Pair
MairH = PairH * (Hwt / 3)
MairV = PairV * (L)
JEqVi = Eq1Vi
JMqHi = Mq1Hi
JMqVi = Mq1Vi

```

```

C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C2 = T2 * 2 * Ch1 * ((Ka1) ^ 0.5)
C1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1
C2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C2
C1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1
C2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C2
Mc1H = C1H * ((H1 / 2) + T2)
Mc2H = C2H * (T2 / 2)
Mc1V = C1V * (A + B + C + (D / 2))
Mc2V = C2V * (L)
JCH = C1H + C2H
JCV = C1V + C2V
JMCH = Mc1H + Mc2H
JMCV = Mc1V + Mc2V

EaV = (JEqV + JEaV) - JCV + PairV
Ea = (JEqH + JEaH) - JCH + PairH
MaV = (JMqV + JMaV) - JMCV + MairV
Ma = (JMqH + JMaH) - JMCH + MairH

'Gaya Internal'
'Beban Merata'
QQ = Q
Do While QQ < 0
Eq1i = (Q * L1) * Kal
Eq1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Eq1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Mq1Hi = Eq1Hi * (H1 / 2)
Mq1Vi = Eq1Vi * (B + C + (D / 2))
Loop
'Beban Tanah'
Ea1i = 0.5 * L1 ^ 2 * Ga1 * Kal
Ea1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1i
Ea1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1i
MalHi = Ea1Hi * (H1 / 3)
MalVi = Ea1Vi * (B + C + ((1 / 3) * D))

'Cohesi'
C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1i
Mc1Hi = C1H * (H1 / 2)
Mc1Vi = C1V * (B + C + ((D / 2)))
JEqHi = Eq1Hi
Ea3H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
JEaVi = Ea1Vi
JEaHi = Ea1Hi
JMaHi = Ma1Hi
JMaVi = Ma1Vi
JCHi = C1Hi
JCVi = C1Vi
JMCHi = Mc1Hi
JMCVi = Mc1Vi
EaVi = (JEqVi + JEaVi) - JCVi
Eai = (JEqHi + JEaHi) - JCHi
MaVi = (JMqVi + JMaVi) - JMCVi
Mai = (JMqHi + JMaHi) - JMCHi
End If
End Sub
Sub Kering()
On Error Resume Next
QQ = Q
'Takanan Pasif
Epp = 0.5 * (T2) ^ 2 * Gb1 * Kp
Cp = T2 * 2 * Ch1 * ((Kp) ^ 0.5)
Mep = Epp * (T2 / 3)
Mcp = Cp * (T2 / 2)
Mpp = Mep + Mcp
Ep = Epp + Cp
'Gaya Eksternal'
'Beban Merata Q'
Do While QQ < 0
Eq1 = (Q * L1) * Kal
Eq2 = (Q + L1 * Gb1) * T2 * Kal
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Mq1H = Eq1H * (H1 / 2) + T2
Mq2H = Eq2H * (T2 / 2)
Mq1V = Eq1V * (A + B + C + (D / 2))
Mq2V = Eq2V * (A + B + C + D + E)
QQ = 0
Loop
'Beban Tanah'
Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Kal
Ea2 = ((L1 * Gb1) * Kal) * T2
Ea3 = 0.5 * (T2) ^ 2 * Gb1 * Kal
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Eq1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i

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22))) * Ea3
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea2
Ea3V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea3
Ma1H = Ea1H * (H1 / 3) + T2
Ma2H = Ea2H * (H1 / 2) + T2
Ma3H = Ea3H * (T2 / 2)
Ma1V = Ea1V * (A + B + C + (D / 3))
Ma2V = Ea2V * (A + B + C + (D / 2))
Ma3V = Ea3V * (L)

'Cohesi Tanah'
C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C2 = T2 * 2 * Ch1 * ((Ka1) ^ 0.5)
C1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1
C2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C2
C1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1
C2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C2
Mc1H = C1H * (H1 / 2) + T2
Mc2H = C2H * (T2 / 2)
Mc1V = C1V * (A + B + C + (D / 2))
Mc2V = C2V * (L)
JEqH = Eq1H + Eq2H
JEqV = Eq1V + Eq2V
JMqH = Mq1H + Mq2H
JMqV = Mq1V + Mq2V
JEaV = Ea1V + Ea2V + Ea3V
JEaH = Ea1H + Ea2H + Ea3H
JMaH = Ma1H + Ma2H + Ma3H
JMaV = Ma1V + Ma2V + Ma3V
JCH = C1H + C2H
JCV = C1V + C2V
JMCH = Mc1H + Mc2H
JMCV = Mc1V + Mc2V

EaV = (JEqV + JEaV) - JCV
Ea = (JEqH + JEaH) - JCH
MaV = (JMqV + JMaV) - JMCV
Ma = (JMqH + JMaH) - JMCH

'Gaya Internal'
'Beban Merata'
QQ = Q
Do While QQ < 0
Eq1I = (Q * L1) * Ka1
Eq1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1I
'Internal'

Mq1Hi = Eq1Hi * (H1 / 2)
Mq1Vi = Eq1Vi * (B + C + (D / 2))
QQ = 0
Loop
'Beban Tanah'
Ea1I = 0.5 * L1 ^ 2 * Gb1 * Ka1
Ea1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1I
Ea1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1I
Ma1Hi = Ea1Hi * (H1 / 3)
Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * D))

'Cohesi'
ClI = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
ClHi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * ClI
ClVi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * ClI
Mc1Hi = C1H * (H1 / 2)
Mc1Vi = C1V * (B + C + ((D / 2)))
JEqHi = Eq1Hi
JEqVi = Eq1Vi
JMqHi = Mq1Hi
JMqVi = Mq1Vi
JEaVi = Ea1Vi
JEaHi = Ea1Hi
JMaHi = Ma1Hi
JMaVi = Ma1Vi
JCHi = C1Hi
JCVi = C1Vi
JMCHi = Mc1Hi
JMCVi = Mc1Vi

EaVi = (JEqVi + JEaVi) - JCVi
Eai = (JEqHi + JEaHi) - JCHi
MaVi = (JMqVi + JMaVi) - JMCVi
Mai = (JMqHi + JMaHi) - JMCHi
End Sub
Sub BrtBangunan()
On Error Resume Next
'Eksternal'
W1 = T2 * L * gpas
W2 = 0.5 * B * T1 * gpas
W3 = 0.5 * D * T1 * gpas
W4 = C * T1 * gpas
V = W1 + W2 + W3 + W4 + EaV
GW1 = W1 * (L / 2)
GW2 = W2 * (A + ((2 / 3) * B))
GW3 = W3 * (A + B + C + (D / 3))
GW4 = W4 * (A + B + (C / 2))
Mp = GW1 + GW2 + GW3 + GW4 + MaV +
Mpp
If Hwt = H1 Then
    pesan1 = "Berat Volume Tanah"

```

```

Wi2 = 0.5 * B * T1 * gpas
Wi3 = 0.5 * D * T1 * gpas
Wi4 = C * T1 * gpas
Vi = Wi2 + Wi3 + Wi4 + EaVi
GWi2 = Wi2 * (A + ((2 / 3) * B))
GWi3 = Wi3 * (A + B + C + (D / 3))
GWi4 = Wi4 * (A + B + (C / 2))
Mpi = GWi2 + GWi3 + GWi4 + MaVi +
Mpp
End Sub
Sub Stabilitas()
Teknetto = Text5.Text
On Error Resume Next
If Option1.Value = True Then
Gf = Ga1
ElseIf Option2.Value = True Then
Gf = Gb1
End If
'Internal'
Eksi = (((((B + C + D) / 2) - ((Mpi - Mai) /
Vi)) * (6 / (B + C + D))) - 1)
Eks2 = (((B + C + D) / 2) - ((Mpi - Mai) /
Vi))
Desaki = (((V / (B + C + D)) * (1 + ((6 *
Eks2) / (B + C + D)))) / Desaktnh) - 1)
Tariki = (((V / (B + C + D)) * (1 - ((6 *
Eks2) / (B + C + D)))) / Tariktnh) - 1)
Geseri = (((3 / 2) * (Eai / (B + C + D))) /
Gesertnh) - 1)
'Eksternal'
Eks = (((L / 2) - ((Mp - Ma) / V)) * (6 / L))
- 1)
Eks1 = ((L / 2) - ((Mp - Ma) / V))
Guling = (((Mp / Ma) / 1.5) - 1)
Geser = (((((V * (Tan(Phi1 / (180 * 7 /
22)))) + Ep) / Ea) / 1.5) - 1)
Dukungmax = (((V / L) * (1 + ((6 * Eks1) /
L))) / Teknetto) - 1)
Dukungmin = ((L / (6 * Eks1)) - 1)
End Sub
Sub Gammatnh()
On Error Resume Next
Do While xx > 0
MDIForm1.StatusBar1.Panels("koko").Text
= "Data Berat volume tanah"
H1 = Text3.Text
If Option1.Value = True Then GoTo
BBasah
If Option2.Value = True Then GoTo
KKering
BBasah:
Terendam Lapis 1="
Ga1 = InputBox(pesan1, "Gamma
Aksen")
ElseIf Hwt < H1 Then
pesan1 = "Berat Volume Tanah
Terendam Lapis 1="
pesan2 = "Berat Volume Tanah Basah 1="
Ga1 = InputBox(pesan1, "Gamma Aksen")
Gb1 = InputBox(pesan2, "Gamma Basah")
End If
xx = 0
Exit Sub
KKering: pesan1 = "Berat Volume Tanah
Basah Lapis 1="Gb1 = InputBox(pesan1,
"Gamma Basah")
xx = 0
Loop
MDIForm1.StatusBar1.Panels("koko").Text =
"Proses Optimasi ...."
End Sub
Private Sub Form_Load()
Me.Top = 0
Me.Left = 0
End Sub

```

Lapis 2

```

Private Sub Basah()
On Error Resume Next
    Hw1 = H1 - (Ht - Hwt)
    Hw2 = H2 - (Ht - Hwt - H1)
    DM1a = ((Hw1 * D) / T1)
    da = ((Hw2 * D) / T1)
    Lw1 = ((Hw1) / (Abs(Cos(lamda * (180 * 7 / 22)))))
    Lw2 = ((Hw2) / (Abs(Cos(lamda * (180 * 7 / 22))))
    'Tekanan Pasif
    Epp = 0.5 * (T2) ^ 2 * Ga2 * Kp
    Cp = T2 * 2 * Ch2 * ((Kp) ^ 0.5)
    Ppair = 0.5 * (T2) ^ 2 * Gw
    Mep = Ep * (T2 / 3)
    Mcp = Cp * (T2 / 2)
    Mpairs = Ppair * (T2 / 3)
    Mpp = Mep + Mcp + Mair
    Ep = Epp + Cp + Ppair

    If Hwt = Ht Then
        'Gaya Eksternal'
        'Beban Merata Q'
        QQ = Q
        Do While QQ < 0
            Eq1 = (Q * L1) * Ka1
            Eq2 = (Q + L1 * Ga1) * L2 * Ka2
            Eq3 = (Q + L1 * Ga1 + L2 * Ga2) * T2 *
            Ka2
            QQ = 0
            Loop
            Eq1H = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Eq1
            Eq2H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Eq2
            Eq3H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Eq3
            Eq1V = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Eq1
            Eq2V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Eq2
            Eq3V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Eq3
            Mq1H = Eq1H * ((H1 / 2) + (H2 + T2))
            Mq2H = Eq2H * ((H2 / 2) + T2)
            Mq3H = Eq3H * (T2 / 2)
            Mq1V = Eq1V * (A + B + C + (DM1 / 2))
            Mq2V = Eq2V * (A + B + C + (D / 2))
            Mq3V = Eq3V * (L)
            JEqh = Eq1H + Eq2H + Eq3H
            JEqv = Eq1V + Eq2V + Eq3V
            JMqh = Mq1H + Mq2H + Mq3H

```

$$JMqV = Mq1V + Mq2V + Mq3V$$

'Beban Tanah'

```

Ea1 = 0.5 * (L1) ^ 2 * Ga1 * Ka1
Ea2 = (L1 * Ga1) * Ka2 * L2
Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
Ea4 = (L1 * Ga1 + L2 * Ga2) * Ka2 * T2
Ea5 = 0.5 * (T2) ^ 2 * Ga2 * Ka2
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Ea1
Ea2H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea2
Ea3H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea3
Ea4H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea4
Ea5H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea5
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Ea1
Ea2V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea2
Ea3V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea3
Ea4V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea4
Ea5V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea5
Ma1H = Ea1H * ((H1 / 3) + (H2 + T2))
Ma2H = Ea2H * (H2 / 2) + T2
Ma3H = Ea3H * (H2 / 3) + T2
Ma4H = Ea4H * (T2 / 2)
Ma5H = Ea5H * (T2 / 3)
Ma1V = Ea1V * (A + B + C + ((1 / 3) *
DM1))
Ma2V = Ea2V * (A + B + C + (D / 2))
Ma3V = Ea3V * (A + B + C + ((1 / 3) * D))
Ma4V = Ea4V * (L)
Ma5V = Ea5V * (L)
JEaV = Ea1V + Ea2V + Ea3V + Ea4V +
Ea5V
JEaH = Ea1H + Ea2H + Ea3H + Ea4H +
Ea5H
JMaH = Ma1H + Ma2H + Ma3H + Ma4H +
Ma5H
JMaV = Ma1V + Ma2V + Ma3V + Ma4V +
Ma5V

'Beban Air'
Pair = 0.5 * (L1 + L2 + T2) ^ 2 * Gw
PairH = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * PairH
PairV = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * PairV
MairH = PairH * (Hwt / 3)

```

MairV = PairV * (L)

'Cohesi Tanah'

$$\begin{aligned}
 C1 &= L1 * 2 * Ch1 * ((Ka1) ^ 0.5) \\
 C2 &= L2 * 2 * Ch2 * ((Ka2) ^ 0.5) \\
 C3 &= T2 * 2 * Ch2 * ((Ka2) ^ 0.5) \\
 C1H &= (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1 \\
 C2H &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2 \\
 C3H &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C3 \\
 C1V &= (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1 \\
 C2V &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2 \\
 C3V &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C3 \\
 Mc1H &= C1H * ((H1 / 2) + (H2 + T2)) \\
 Mc2H &= C2H * (H2 / 2) + T2 \\
 Mc3H &= C3H * (T2 / 2) \\
 Mc1V &= C1V * (A + B + C + (DM1 / 2)) \\
 Mc2V &= C2V * (A + B + C + (D / 2)) \\
 Mc3V &= C3V * (L) \\
 JCH &= C1H + C2H + C3H \\
 JCV &= C1V + C2V + C3V \\
 JMCH &= Mc1H + Mc2H + Mc3H \\
 JMCV &= Mc1V + Mc2V + Mc3V \\
 \\
 EaV &= (JEqV + JEaV) - JCV + PairV \\
 Ea &= (JEqH + JEaH) - JCH + PairH \\
 MaV &= (JMqV + JMaV) - JMCV + MairV \\
 Ma &= (JMqH + JMaH) - JMCH + MairH
 \end{aligned}$$

'Gaya Internal'

'Beban Merata Q'

$$QQ = Q$$

Do While QQ $\lhd\!\!> 0$

$$\begin{aligned}
 Eq1i &= (Q * L1) * Ka1 \\
 Eq2i &= (Q + L1 * Ga1) * L2 * Ka2
 \end{aligned}$$

$$QQ = 0$$

Loop

$$\begin{aligned}
 Eq1Hi &= (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i \\
 Eq2Hi &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i \\
 Eq1Vi &= (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i \\
 Eq2Vi &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i \\
 Mq1Hi &= Eq1Hi * ((H1 / 2) + H2) \\
 Mq2Hi &= Eq2Hi * (H2 / 2) \\
 Mq1Vi &= Eq1Vi * (B + C + (DM1 / 2)) \\
 Mq2Vi &= Eq2Vi * (B + C + (D / 2))
 \end{aligned}$$

'Beban Tanah'

$$\begin{aligned}
 Ea1i &= 0.5 * L1 ^ 2 * Ga1 * Ka1 \\
 Ea2i &= ((L1 * Ga1) * Ka2) * L2 \\
 Ea3i &= 0.5 * L2 ^ 2 * Ga2 * Ka2 \\
 Ea1Hi &= (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i \\
 Ea2Hi &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i \\
 Ea3Hi &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i \\
 Ea1Vi &= (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i \\
 Ea2Vi &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i \\
 Ea3Vi &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i \\
 Ma1Hi &= Ea1Hi * ((H1 / 3) + H2) \\
 Ma2Hi &= Ea2Hi * (H2 / 2) \\
 Ma3Hi &= Ea3Hi * (H2 / 3) \\
 Ma1Vi &= Ea1Vi * (B + C + ((1 / 3) * DM1a)) \\
 Ma2Vi &= Ea2Vi * (B + C + (DM1 / 2)) \\
 Ma3Vi &= Ea3Vi * (B + C + ((1 / 3) * D))
 \end{aligned}$$

'Beban Air'

$$\begin{aligned}
 Pairi &= 0.5 * (Lw1) ^ 2 * Gw \\
 PairHi &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Pairi \\
 PairVi &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Pairi \\
 MairHi &= PairHi * (Hwt / 3) \\
 MairVi &= PairVi * (B + C + ((1 / 3) * D))
 \end{aligned}$$

'Cohesi'

$$\begin{aligned}
 C1i &= L1 * 2 * Ch1 * ((Ka1) ^ 0.5) \\
 C2i &= L2 * 2 * Ch2 * ((Ka2) ^ 0.5) \\
 C1Hi &= (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1 \\
 C2Hi &= (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2 \\
 C1Vi &= (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1 \\
 C2Vi &= (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2 \\
 Mc1Hi &= C1Hi * ((H1 / 2) + H2) \\
 Mc2Hi &= C2Hi * (H2 / 2) \\
 Mc1Vi &= C1Vi * (B + C + (DM1 / 2)) \\
 Mc2Vi &= C2Vi * (B + C + (D / 2)) \\
 JEqHi &= Eq1Hi + Eq2Hi \\
 JEqVi &= Eq1Vi + Eq2Vi \\
 JMqHi &= Mq1Hi + Mq2Hi \\
 JMqVi &= Mq1Vi + Mq2Vi \\
 JEaVi &= E1Vi + E2Vi + E3Vi \\
 JEaHi &= E1Hi + E2Hi + E3Hi \\
 JMaHi &= Ma1Hi + Ma2Hi + Ma3Hi
 \end{aligned}$$

$$JMaVi = Ma1Vi + Ma2Vi + Ma3Vi$$

$$JCHi = C1Hi + C2Hi$$

$$JCVi = C1Vi + C2Vi$$

$$JMCHi = Mc1Hi + Mc2Hi$$

$$JMCVi = Mc1Vi + Mc2Vi$$

$$EaVi = (JEqVi + JEaVi) - JCVi + PairVi$$

$$Eai = (JEqHi + JEaHi) - JCHi + PairHi$$

$$MaVi = (JMqVi + JMaVi) - JMCVi +$$

$$MairVi$$

$$Mai = (JMqHi + JMaHi) - JMCHi + MairHi$$

ElseIf Hwt > (H2 + T2) And Ht > Hwt

Then

'Gaya Eksternal'

'Beban Merata Q'

$$QQ = Q$$

Do While QQ <> 0

$$Eq1 = Q * (L1 - Lw1) * Ka1$$

$$Eq2 = (Q + (L1 - Lw1) * Gb1) * Lw1 * Ka1$$

$$Eq3 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1) * L2 * Ka2$$

$$Eq4 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2) * T2 * Ka2$$

$$QQ = 0$$

Loop

$$Eq1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1$$

$$Eq2H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2$$

$$Eq3H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3$$

$$Eq4H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq4$$

$$Eq1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1$$

$$Eq2V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2$$

$$Eq3V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3$$

$$Eq4V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq4$$

$$Mq1H = Eq1H * (((H1 - Hw1) / 2) + (Hw1 + H2 + T2))$$

$$Mq2H = Eq2H * ((Hw1 / 2) + (H2 + T2))$$

$$Mq3H = Eq3H * ((H2 / 2) + T2)$$

$$Mq4H = Eq4H * (T2 / 2)$$

$$Mq1V = Eq1V * (A + B + C + (DM1a / 2))$$

$$Mq2V = Eq2V * (A + B + C + (DM1 / 2))$$

$$Mq3V = Eq3V * (A + B + C + (D / 2))$$

$$Mq4V = Eq4V * (L)$$

$$JEqH = Eq1H + Eq2H + Eq3H + Eq4H$$

$$JEqV = Eq1V + Eq2V + Eq3V + Eq4V$$

$$JMqH = Mq1H + Mq2H + Mq3H + Mq4H$$

$$JMqV = Mq1V + Mq2V + Mq3V + Mq4V$$

'Beban Tanah'

$$Ea1 = 0.5 * (L1 - Lw1) ^ 2 * Gb1 * Ka1$$

$$Ea2 = ((L1 - Lw1) * Gb1 * Ka1) * Lw1$$

$$Ea3 = 0.5 * (Lw1) ^ 2 * Ga1 * Ka1$$

$$Ea4 = ((L1 - Lw1) * Gb1 + Lw1 * Ga1) *$$

$$Ka2 * L2$$

$$Ea5 = 0.5 * (L2) ^ 2 * Ga2 * Ka2$$

$$Ea6 = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 +$$

$$L2 * Ga2) * Ka2 * T2$$

$$Ea7 = 0.5 * (T2) ^ 2 * Ga2 * Ka2$$

$$Ea1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$$

$$Ea2H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2$$

$$Ea3H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea3$$

$$Ea4H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$$

$$Ea5H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$$

$$Ea6H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea6$$

$$Ea7H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea7$$

$$Ea1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$$

$$Ea2V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2$$

$$Ea3V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea3$$

$$Ea4V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$$

$$Ea5V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$$

$$Ea6V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea6$$

$$Ea7V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea7$$

$$Ma1H = Ea1H * (((H1 - Hw1) / 3) + (H2 + T2))$$

$$Ma2H = Ea2H * ((Hw1 / 2) + (H2 + T2))$$

$$Ma3H = Ea3H * ((Hw1 / 3) + (H2 + T2))$$

$$Ma4H = Ea4H * (H2 / 2) + T2$$

$$Ma5H = Ea5H * (H2 / 3) + T2$$

$$Ma6H = Ea6H * (T2 / 2)$$

$$Ma7H = Ea7H * (T2 / 3)$$

$$Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1a))$$

$$Ma2V = Ea2V * (A + B + C + (DM1 / 2))$$

$$Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM1))$$

$$Ma4V = Ea4V * (A + B + C + (D / 2))$$

$$Ma5V = Ea5V * (A + B + C + ((1 / 3) * D))$$

$\text{Ma6V} = \text{Ea6V} * (\text{L})$
 $\text{Ma7V} = \text{Ea7V} * (\text{L})$
 $\text{JEaV} = \text{Ea1V} + \text{Ea2V} + \text{Ea3V} + \text{Ea4V} +$
 $\text{Ea5V} + \text{Ea6V} + \text{Ea7V}$
 $\text{JEaH} = \text{Ea1H} + \text{Ea2H} + \text{Ea3H} + \text{Ea4H} +$
 $\text{Ea5H} + \text{Ea6H} + \text{Ea7H}$
 $\text{JMaH} = \text{Ma1H} + \text{Ma2H} + \text{Ma3H} + \text{Ma4H} +$
 $\text{Ma5H} + \text{Ma6H} + \text{Ma7H}$
 $\text{JMaV} = \text{Ma1V} + \text{Ma2V} + \text{Ma3V} + \text{Ma4V} +$
 $\text{Ma5V} + \text{Ma6V} + \text{Ma7V}$

'Beban Air'
 $\text{Pair} = 0.5 * (\text{Lw1} + \text{L2} + \text{T2}) ^ 2 * \text{Gw}$
 $\text{PairH} = (\text{Cos}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{PairH}$
 $\text{PairV} = (\text{Sin}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{PairH}$
 $\text{MairH} = \text{PairV} * (\text{Hwt} / 3)$
 $\text{MairV} = \text{PairV} * (\text{L})$

'Cohesi Tanah'
 $\text{C1} = \text{L1} * 2 * \text{Ch1} * ((\text{Ka1}) ^ 0.5)$
 $\text{C2} = \text{L2} * 2 * \text{Ch2} * ((\text{Ka2}) ^ 0.5)$
 $\text{C3} = \text{T2} * 2 * \text{Ch2} * ((\text{Ka2}) ^ 0.5)$
 $\text{C1H} = (\text{Cos}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{C1}$
 $\text{C2H} = (\text{Cos}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{C2}$
 $\text{C3H} = (\text{Cos}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{C3}$
 $\text{C1V} = (\text{Sin}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{C1}$
 $\text{C2V} = (\text{Sin}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{C2}$
 $\text{C3V} = (\text{Sin}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{C3}$
 $\text{Mc1H} = \text{C1H} * ((\text{H1} / 2) + (\text{H2} + \text{T2}))$
 $\text{Mc2H} = \text{C2H} * ((\text{H2} / 2) + \text{T2})$
 $\text{Mc3H} = \text{C3H} * (\text{T2} / 2)$
 $\text{Mc1V} = \text{C1V} * (\text{A} + \text{B} + \text{C} + (\text{DM1} / 2))$
 $\text{Mc2V} = \text{C2V} * (\text{A} + \text{B} + \text{C} + (\text{D} / 2))$
 $\text{Mc3V} = \text{C3V} * (\text{L})$
 $\text{JCH} = \text{C1H} + \text{C2H} + \text{C3H}$
 $\text{JCV} = \text{C1V} + \text{C2V} + \text{C3V}$
 $\text{JMCH} = \text{Mc1H} + \text{Mc2H} + \text{Mc3H}$
 $\text{JMCV} = \text{Mc1V} + \text{Mc2V} + \text{Mc3V}$

 $\text{EaV} = (\text{JEqV} + \text{JEaV}) - \text{JCV} + \text{PairV}$
 $\text{Ea} = (\text{JEqH} + \text{JEaH}) - \text{JCH} + \text{PairH}$
 $\text{MaV} = (\text{JMqV} + \text{JMaV}) - \text{JMCV} + \text{MairV}$
 $\text{Ma} = (\text{JMqH} + \text{JMaH}) - \text{JMCH} + \text{MairH}$

'Gaya Internal'
'Beban Merata Q'
 $\text{QQ} = \text{Q}$

Do While QQ < 0
 $\text{Eq1i} = (\text{Q} * \text{L1}) * \text{Ka1}$
 $\text{Eq2i} = (\text{Q} + (\text{L1} - \text{Lw1}) * \text{Gb1}) * \text{Lw1} * \text{Ka1}$
 $\text{Eq3i} = (\text{Q} + ((\text{L1} - \text{Lw1}) * \text{Gb1}) + \text{Lw1} * \text{Ga1}) * \text{L2} * \text{Ka2}$
 $\text{QQ} = 0$
Loop
 $\text{Eq1Hi} = (\text{Cos}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Eq1i}$
 $\text{Eq2Hi} = (\text{Cos}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Eq2i}$
 $\text{Eq3Hi} = (\text{Cos}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{Eq3i}$
 $\text{Eq1Vi} = (\text{Sin}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Eq1i}$
 $\text{Eq2Vi} = (\text{Sin}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Eq2i}$
 $\text{Eq3Vi} = (\text{Sin}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{Eq3i}$
 $\text{Mq1Hi} = \text{Eq1Hi} * (((\text{H1} - \text{Hw1}) / 2) + (\text{Hw1} + \text{H2}))$
 $\text{Mq2Hi} = \text{Eq2Hi} * ((\text{Hw1} / 2) + \text{H2})$
 $\text{Mq3Hi} = \text{Eq3Hi} * (\text{H2} / 2)$
 $\text{Mq1Vi} = \text{Eq1Vi} * (\text{B} + \text{C} + (\text{DM1a} / 2))$
 $\text{Mq2Vi} = \text{Eq2Vi} * (\text{B} + \text{C} + (\text{DM1} / 2))$
 $\text{Mq3Vi} = \text{Eq3Vi} * (\text{B} + \text{C} + (\text{D} / 2))$

'Beban Tanah'
 $\text{Ea1i} = 0.5 * \text{L1} ^ 2 * \text{Ga1} * \text{Ka1}$
 $\text{Ea2i} = ((\text{L1} - \text{Lw1}) * \text{Gb1}) * \text{Ka1} * \text{Lw1}$
 $\text{Ea3i} = 0.5 * (\text{Lw1}) ^ 2 * \text{Ga2} * \text{Ka2}$
 $\text{Ea4i} = ((\text{L1} - \text{Lw1}) * \text{Gb1} + \text{Lw1} * \text{Ga1}) * \text{Ka2} * \text{L2}$
 $\text{Ea1Hi} = (\text{Cos}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea1i}$
 $\text{Ea2Hi} = (\text{Cos}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea2i}$
 $\text{Ea3Hi} = (\text{Cos}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea3i}$
 $\text{Ea4Hi} = (\text{Cos}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea4i}$
 $\text{Ea1Vi} = (\text{Sin}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea1i}$
 $\text{Ea2Vi} = (\text{Sin}((\Delta\text{t1} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea2i}$
 $\text{Ea3Vi} = (\text{Sin}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea3i}$
 $\text{Ea4Vi} = (\text{Sin}((\Delta\text{t2} + \text{lamda}) / (180 * 7 / 22))) * \text{Ea4i}$
 $\text{Ma1Hi} = \text{Ea1Hi} * (((\text{H1} - \text{Hw1}) / 3) + (\text{Hw1} + \text{H2}))$
 $\text{Ma2Hi} = \text{Ea2Hi} * ((\text{Hw1} / 2) + \text{H2})$
 $\text{Ma3Hi} = \text{Ea3Hi} * ((\text{Hw1} / 3) + \text{H2})$
 $\text{Ma4Hi} = \text{Ea4Hi} * (\text{H2} / 2)$

$Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1a))$
 $Ma2Vi = Ea2Vi * (B + C + (DM1 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM1))$
 $Ma4Vi = Ea4Vi * (B + C + (D / 2))$

 'Beban Air'
 $Pairi = 0.5 * (Lw1 + L2) ^ 2 * Gw$
 $PairHi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Pairi$
 $PairVi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

 'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $Mc1Hi = C1H * ((H1 / 2) + H2)$
 $Mc2Hi = C2H * (H2 / 2)$
 $Mc1Vi = C1V * (B + C + (DM1 / 2))$
 $Mc2Vi = C2V * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +$
 $Ma4Hi$
 $JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +$
 $Ma4Vi$
 $JCHi = C1Hi + C2Hi$
 $JCVi = C1Vi + C2Vi$
 $JMCHi = Mc1Hi + Mc2Hi$
 $JMCVi = Mc1Vi + Mc2Vi$

 $EaVi = (JEqVi + JEaVi) - JCVi + PairVi$
 $Eai = (JEqHi + JEaHi) - JCHi + PairHi$
 $MaVi = (JMqVi + JMaVi) - JMCHi +$
 $MairVi$
 $Mai = (JMqHi + JMaHi) - JMCHi + MairHi$

 ElseIf $Hwt = (H2 + T2)$ And $Ht > Hwt$
 Then
 'Gaya Eksternal'

'Beban Merata Q'
 $QQ = Q$
 Do While $QQ < 0$
 $Eq1 = (Q * L1) * Ka1$
 $Eq2 = (Q + L1 * Gb1) * L2 * Ka2$
 $Eq3 = (Q + L1 * Gb1 + L2 * Ga2) * T2 *$
 $Ka2$
 $QQ = 0$
 Loop
 $Eq1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1$
 $Eq2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2$
 $Eq3H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3$
 $Eq1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1$
 $Eq2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2$
 $Eq3V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3$
 $Mq1H = Eq1H * ((H1 / 2) + (H2 + T2))$
 $Mq2H = Eq2H * ((H2 / 2) + T2)$
 $Mq3H = Eq3H * (T2 / 2)$
 $Mq1V = Eq1V * (A + B + C + (DM1 / 2))$
 $Mq2V = Eq2V * (A + B + C + (D / 2))$
 $Mq3V = Eq3V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H$
 $JEqV = Eq1V + Eq2V + Eq3V$
 $JMqH = Mq1H + Mq2H + Mq3H$
 $JMqV = Mq1V + Mq2V + Mq3V$

 'Beban Tanah'
 $Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Ka1$
 $Ea2 = (L1 * Gb1) * Ka2 * L2$
 $Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2$
 $Ea4 = (L1 * Gb1 + L2 * Ga2) * Ka2 * T2$
 $Ea5 = 0.5 * (T2) ^ 2 * Ga2 * Ka2$
 $Ea1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$

$22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + T2)$
 $Ma3H = Ea3H * ((H2 / 3) + T2)$
 $Ma4H = Ea4H * (T2 / 2)$
 $Ma5H = Ea5H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (D / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * D))$
 $Ma4V = Ea4V * (L)$
 $Ma5V = Ea5V * (L)$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V$

'Beban Air'
 $Pair = 0.5 * (L2 + T2) ^ 2 * Gw$
 $PairH = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = T2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C3$
 $C1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C3$
 $Mc1H = C1H * ((H1 / 2) + (H2 + T2))$
 $Mc2H = C2H * ((H2 / 2) + T2)$
 $Mc3H = C3H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (D / 2))$
 $Mc3V = C3V * (L)$
 $JCH = C1H + C2H + C3H$

$JCV = C1V + C2V + C3V$
 $JMCH = Mc1H + Mc2H + Mc3H$
 $JMCV = Mc1V + Mc2V + Mc3V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JEqV + JMaV) - JMCV + MairV$
 $Ma = (JEqH + JMaH) - JMCH + MairH$

'Gaya Internal'
'Beban Merata Q'
 $QQ = Q$
Do While $QQ \diamond 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Gb1) * L2 * Ka2$
 $QQ = 0$
Loop
 $Eq1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Mq1Hi = Eq1Hi * ((H1 / 2))$
 $Mq2Hi = Eq2Hi * (H2 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (D / 2))$

'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Gb1 * Kal$
 $Ea2i = ((L1 * Gb1) * Ka2) * L2$
 $Ea3i = 0.5 * L2 ^ 2 * Ga2 * Ka2$
 $Ea1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ma1Hi = Ea1H * ((H1 / 3) + H2)$
 $Ma2Hi = Ea2H * (H2 / 2)$
 $Ma3Hi = Ea3H * (H2 / 3)$
 $Ma1Vi = Ea1V * (B + C + ((1 / 3) * DM1))$
 $Ma2Vi = Ea2V * (B + C + (D / 2))$
 $Ma3Vi = Ea3V * (B + C + ((1 / 3) * D))$

'Beban Air'
 $Paii = 0.5 * (L2) ^ 2 * Gw$

$\text{PairHi} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Pair}_i$
 $\text{PairVi} = (\text{Sin}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Pair}_i$
 $\text{MairHi} = \text{PairHi} * (\text{Hwt} / 3)$
 $\text{MairVi} = \text{PairVi} * (\text{B} + \text{C} + ((1 / 3) * \text{D}))$

'Cohesi'
 $\text{C1i} = \text{L1} * 2 * \text{Ch1} * ((\text{Ka1}) ^ 0.5)$
 $\text{C2i} = \text{L2} * 2 * \text{Ch2} * ((\text{Ka2}) ^ 0.5)$
 $\text{C1Hi} = (\text{Cos}((\Delta_1 + \lambda) / (180 * 7 / 22))) * \text{C1i}$
 $\text{C2Hi} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{C2i}$
 $\text{C1Vi} = (\text{Sin}((\Delta_1 + \lambda) / (180 * 7 / 22))) * \text{C1i}$
 $\text{C2Vi} = (\text{Sin}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{C2i}$
 $\text{Mc1Hi} = \text{C1H} * ((\text{H1} / 2) + \text{H2})$
 $\text{Mc2Hi} = \text{C2H} * (\text{H2} / 2)$
 $\text{Mc1Vi} = \text{C1V} * (\text{B} + \text{C} + (\text{DM1} / 2))$
 $\text{Mc2Vi} = \text{C2V} * (\text{B} + \text{C} + (\text{D} / 2))$
 $\text{JEqHi} = \text{Eq1Hi} + \text{Eq2Hi}$
 $\text{JEqVi} = \text{Eq1Vi} + \text{Eq2Vi}$
 $\text{JMqHi} = \text{Mq1Hi} + \text{Mq2Hi}$
 $\text{JMqVi} = \text{Mq1Vi} + \text{Mq2Vi}$
 $\text{JEaVi} = \text{Ea1Vi} + \text{Ea2Vi} + \text{Ea3Vi}$
 $\text{JEaHi} = \text{Ea1Hi} + \text{Ea2Hi} + \text{Ea3Hi}$
 $\text{JMaHi} = \text{Ma1Hi} + \text{Ma2Hi} + \text{Ma3Hi}$
 $\text{JMaVi} = \text{Ma1Vi} + \text{Ma2Vi} + \text{Ma3Vi}$
 $\text{JCHi} = \text{C1Hi} + \text{C2Hi}$
 $\text{JCVi} = \text{C1Vi} + \text{C2Vi}$
 $\text{JMCHi} = \text{Mc1Hi} + \text{Mc2Hi}$
 $\text{JMCVi} = \text{Mc1Vi} + \text{Mc2Vi}$

 $\text{EaVi} = (\text{JEqVi} + \text{JEaVi}) - \text{JCVi} + \text{PairVi}$
 $\text{Eai} = (\text{JEqHi} + \text{JEaHi}) - \text{JCHi} + \text{PairHi}$
 $\text{MaVi} = (\text{JMqVi} + \text{JMaVi}) - \text{JMCVi} + \text{MairVi}$
 $\text{Mai} = (\text{JMqHi} + \text{JMaHi}) - \text{JMCHi} + \text{MairHi}$

ElseIf Hwt > T2 And (H2 + T2) > Hwt
Then
'Gaya Eksternal'
'Beban Merata Q'
 $\text{QQ} = \text{Q}$
Do While QQ < 0
 $\text{Eq1} = \text{Q} * (\text{L1}) * \text{Ka1}$
 $\text{Eq2} = (\text{Q} + (\text{L1}) * \text{Gb1}) * (\text{L2} - \text{Lw2}) * \text{Ka2}$
 $\text{Eq3} = (\text{Q} + (\text{L1}) * \text{Gb1} + (\text{L2} - \text{Lw2}) * \text{Gb2}) * \text{Lw2} * \text{Ka2}$
 $\text{Eq4} = (\text{Q} + (\text{L1}) * \text{Gb1} + (\text{L2} - \text{Lw2}) * \text{Gb2} + \text{Lw2} * \text{Ga2}) * \text{T2} * \text{Ka2}$
 $\text{QQ} = 0$
Loop

'Beban Tanah'
 $\text{Ea1} = 0.5 * (\text{L1}) ^ 2 * \text{Gb1} * \text{Ka1}$
 $\text{Ea2} = ((\text{L1}) * \text{Gb1} * \text{Ka2}) * (\text{L2} - \text{Lw2})$
 $\text{Ea3} = 0.5 * (\text{L2} - \text{Lw2}) ^ 2 * \text{Gb2} * \text{Ka2}$
 $\text{Ea4} = ((\text{L1} * \text{Gb1} + (\text{L2} - \text{Lw2}) * \text{Ga2}) * \text{Ka2}) * \text{Lw2}$
 $\text{Ea5} = 0.5 * (\text{Lw2}) ^ 2 * \text{Ga2} * \text{Ka2}$
 $\text{Ea6} = ((\text{L1} - \text{L1}) * \text{Gb1} + (\text{L2} - \text{Lw2}) * \text{Gb2} + \text{Lw2} * \text{Ga2}) * \text{Ka2} * \text{T2}$
 $\text{Ea7} = 0.5 * (\text{T2}) ^ 2 * \text{Ga2} * \text{Ka2}$
 $\text{Ea1H} = (\text{Cos}((\Delta_1 + \lambda) / (180 * 7 / 22))) * \text{Ea1}$
 $\text{Ea2H} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Ea2}$
 $\text{Ea3H} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Ea3}$
 $\text{Ea4H} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Ea4}$
 $\text{Ea5H} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Ea5}$
 $\text{Ea6H} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Ea6}$
 $\text{Ea7H} = (\text{Cos}((\Delta_2 + \lambda) / (180 * 7 / 22))) * \text{Ea7}$
 $\text{Ea1V} = (\text{Sin}((\Delta_1 + \lambda) / (180 * 7 /$

22))) * Ea1
 $Ea2V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + T2))$
 $Ma2H = Ea2H * (((H2 - Hw2) / 2) + (Hw2 + T2))$
 $Ma3H = Ea3H * (((H2 - Hw2) / 3) + (Hw2 + T2))$
 $Ma4H = Ea4H * ((Hw2 / 2) + T2)$
 $Ma5H = Ea5H * ((Hw2 / 3) + T2)$
 $Ma6H = Ea6H * (T2 / 2)$
 $Ma7H = Ea7H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (da / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * da))$
 $Ma4V = Ea4V * (A + B + C + (D / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * D))$
 $Ma6V = Ea6V * (L)$
 $Ma7V = Ea7V * (L)$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V$

'Beban Air'
 $Pair = 0.5 * (Lw2 + T2) ^ 2 * Gw$
 $PairH = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = T2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C1H = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * C1$

$C2H = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C3$
 $C1V = (\sin((\Delta t_1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C3$
 $Mc1H = C1H * ((H1 / 2) + (H2 + T2))$
 $Mc2H = C2H * ((H2 / 2) + T2)$
 $Mc3H = C3H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (D / 2))$
 $Mc3V = C3V * (L)$
 $JCH = C1H + C2H + C3H$
 $JCV = C1V + C2V + C3V$
 $JMCH = Mc1H + Mc2H + Mc3H$
 $JMCV = Mc1V + Mc2V + Mc3V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JEqV + JMaV) - JMVC + MairV$
 $Ma = (JEqH + JMaH) - JMCH + MairH$

'Gaya Internal'
 'Beban Merata Q'
 $QQ = Q$
 Do While $QQ > 0$
 $Eq1i = (Q * L1) * Kal$
 $Eq2i = (Q + L1 * Gb1) * (L2 - Lw2) * Kal$
 $Eq3i = ((Q + L1 * Gb1) + (L2 - Lw2) * Gb2) * Lw2 * Ka2$
 $QQ = 0$
 Loop
 $Eq1Hi = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq1Vi = (\sin((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\sin((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + H2)$
 $Mq2Hi = Eq2Hi * (((H2 - Hw2) / 2) + Hw2)$
 $Mq3Hi = Eq3Hi * (Hw2 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (da / 2))$

'Beban Tanah'

$$\begin{aligned} Ea1i &= 0.5 * L1 ^ 2 * Gb1 * Ka1 \\ Ea2i &= (L1 * Gb1) * Ka2 * (L2 - Lw2) \\ Ea3i &= 0.5 * (L2 - Lw2) ^ 2 * Gb2 * Ka2 \\ Ea4i &= (L1 * Gb1 + (L2 - Lw2) * Gb2) * \\ &Ka2 * Lw2 \\ Ea5i &= 0.5 * (Lw2) ^ 2 * Ga2 * Ka2 \\ Ea1Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / \\ 22))) * Eali \\ Ea2Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea2i \\ Ea3Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea3i \\ Ea4Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea4i \\ Ea5Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea5i \\ Ea1Vi &= (\sin((\Delta1 + \lambda) / (180 * 7 / \\ 22))) * Eali \\ Ea2Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea2i \\ Ea3Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea3i \\ Ea4Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea4i \\ Ea5Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Ea5i \\ Ma1Hi &= Ea1Hi * ((H1 / 3) + H2) \\ Ma2Hi &= Ea2Hi * (((H2 - Hw2) / 2) + Hw2) \\ Ma3Hi &= Ea3Hi * (((H2 - Hw2) / 3) + Hw2) \\ Ma4Hi &= Ea4Hi * (Hw2 / 2) \\ Ma5Hi &= Ea5Hi * (Hw2 / 3) \\ Ma1Vi &= Ea1Vi * (B + C + ((1 / 3) * \\ DM1)) \\ Ma2Vi &= Ea2Vi * (B + C + (da / 2)) \\ Ma3Vi &= Ea3Vi * (B + C + ((1 / 3) * da)) \\ Ma4Vi &= Ea4Vi * (B + C + (D / 2)) \\ Ma5Vi &= Ea5Vi * (B + C + ((1 / 3) * D)) \end{aligned}$$

'Beban Air'

$$\begin{aligned} Pairi &= 0.5 * (Lw2) ^ 2 * Gw \\ PairHi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Pairi \\ PairVi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Pairi \\ MairHi &= PairHi * (Hwt / 3) \\ MairVi &= PairVi * (B + C + ((1 / 3) * D)) \end{aligned}$$

'Cohesi'

$$\begin{aligned} C1i &= L1 * 2 * Ch1 * ((Ka1) ^ 0.5) \\ C2i &= L2 * 2 * Ch2 * ((Ka2) ^ 0.5) \\ C1Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / \\ 22))) * C1i \\ C2Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * C2i \end{aligned}$$

$$\begin{aligned} Mq3Vi &= Eq3Vi * (B + C + (D / 2)) \\ 22))) * C2i \\ C1Vi &= (\sin((\Delta1 + \lambda) / (180 * 7 / \\ 22))) * C1i \\ C2Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * C2i \\ Mc1Hi &= C1Hi * ((H1 / 2) + H2) \\ Mc2Hi &= C2Hi * (H2 / 2) \\ Mc1Vi &= C1Vi * (B + C + (DM1 / 2)) \\ Mc2Vi &= C2Vi * (B + C + (D / 2)) \\ JEqHi &= Eq1Hi + Eq2Hi + Eq3Hi \\ JEqVi &= Eq1Vi + Eq2Vi + Eq3Vi \\ JMqHi &= Mq1Hi + Mq2Hi + Mq3Hi \\ JMqVi &= Mq1Vi + Mq2Vi + Mq3Vi \\ JEaVi &= Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi \\ + Ea5Vi \\ JEaHi &= Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi \\ + Ea5Hi \\ JMaHi &= Ma1Hi + Ma2Hi + Ma3Hi + \\ Ma4Hi + Ma5Hi \\ JMaVi &= Ma1Vi + Ma2Vi + Ma3Vi + \\ Ma4Vi + Ma5Vi \\ JCHi &= C1Hi + C2Hi \\ JCVi &= C1Vi + C2Vi \\ JMCHi &= Mc1Hi + Mc2Hi \\ JMCVi &= Mc1Vi + Mc2Vi \\ \\ EaVi &= (JEqVi + JEaVi) - JCVi + PairVi \\ Eai &= (JEqHi + JEaHi) - JCHi + PairHi \\ MaVi &= (JMqVi + JMaVi) - JMCVi + \\ MairVi \\ Mai &= (JMqHi + JMaHi) - JMCHi + \\ MairHi \end{aligned}$$

If $Hwt = T2$ And $(H2 + T2) > Hwt$
Then
'Gaya Eksternal'
'Beban Merata Q'
 $QQ = Q$
Do While $QQ < 0$
 $Eq1 = (Q * L1) * Ka1$
 $Eq2 = (Q + L1 * Gb1) * L2 * Ka2$
 $Eq3 = (Q + L1 * Gb1 + L2 * Gb2) * T2 * Ka2$
 $QQ = 0$
Loop
 $Eq1H = (\cos((\Delta1 + \lambda) / (180 * 7 / \\ 22))) * Eq1$
 $Eq2H = (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Eq2$
 $Eq3H = (\cos((\Delta2 + \lambda) / (180 * 7 / \\ 22))) * Eq3$
 $Eq1V = (\sin((\Delta1 + \lambda) / (180 * 7 / \\ 22))) * Eq1$

$\text{Eq3V} = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Eq3}$
 $\text{Mq1H} = \text{Eq1H} * ((H1 / 2) + (H2 + T2))$
 $\text{Mq2H} = \text{Eq2H} * ((H2 / 2) + T2)$
 $\text{Mq3H} = \text{Eq3H} * (T2 / 2)$
 $\text{Mq1V} = \text{Eq1V} * (A + B + C + (DM1 / 2))$
 $\text{Mq2V} = \text{Eq2V} * (A + B + C + (DM2 / 2))$
 $\text{Mq3V} = \text{Eq3V} * (L)$

'Beban Tanah'
 $Ea1 = 0.5 * L1 ^ 2 * Gb1 * Ka1$
 $Ea2 = ((L1 * Gb1) * Ka2) * L2$
 $Ea3 = 0.5 * (L2) ^ 2 * Gb2 * Ka2$
 $Ea4 = ((L1 * Gb1 + L2 * Gb2) * Ka2) * T2$
 $Ea5 = 0.5 * (T2) ^ 2 * Gb2 * Ka2$
 $Ea1H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + T2)$
 $Ma3H = Ea3H * ((H2 / 3) + T2)$
 $Ma4H = Ea4H * (T2 / 2)$
 $Ma5H = Ea5H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (D / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * D))$
 $Ma4V = Ea4V * (L)$
 $Ma5V = Ea5V * (L)$

'Beban Air'
 $\text{Pair} = 0.5 * (T2) ^ 2 * Gw$
 $\text{PairH} = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{PairV} = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{MairH} = \text{PairH} * (Hwt / 3)$
 $\text{MairV} = \text{PairV} * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = T2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C3$
 $C1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C3$
 $Mc1H = C1H * ((H1 / 2) + (H2 + T2))$
 $Mc2H = C2H * ((H2 / 2) + T2)$
 $Mc3H = C3H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (D / 2))$
 $Mc3V = C3V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H$
 $JEqV = Eq1V + Eq2V + Eq3V$
 $JMqH = Mq1H + Mq2H + Mq3H$
 $JMqV = Mq1V + Mq2V + Mq3V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V$
 $JCH = C1H + C2H + C3H$
 $JCV = C1V + C2V + C3V$
 $JMCH = Mc1H + Mc2H + Mc3H$
 $JMCV = Mc1V + Mc2V + Mc3V$

 $EaV = (JEqV + JEaV) - JCV + \text{PairV}$
 $Ea = (JEqH + JEaH) - JCH + \text{PairH}$
 $MaV = (JMqV + JMaV) - JMVC + \text{MairV}$
 $Ma = (JMqH + JMaH) - JMCH + \text{MairH}$

'Gaya Internal'
'Beban Merata Q'
 $QQ = Q$
Do While $QQ < 0$
 $\text{Eq1i} = (Q * L1) * Ka1$
 $\text{Eq2i} = (Q + L1 * Gal) * L2 * Ka2$
 $QQ = 0$
Loop

'Beban Tanah'
 $Eali = 0.5 * (L1) ^ 2 * Gb1 * Ka1$
 $Ea2i = (L1 * Gb1) * Ka2 * L2$
 $Ea3i = 0.5 * (L2) ^ 2 * Gb2 * Ka2$
 $Ea1Hi = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Hi = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Hi = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea1Vi = (\sin((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Vi = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ma1Hi = Ea1Hi * ((H1 / 3) + H2)$
 $Ma2Hi = Ea2Hi * (H2 / 2)$
 $Ma3Hi = Ea3Hi * (H2 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1))$
 $Ma2Vi = Ea2Vi * (B + C + (D / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * D))$

'Cohesi Tanah'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C1Hi = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C1Vi = (\sin((\Delta t_1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C2i$
 $Mc1Hi = C1H * ((H1 / 2) + H2)$
 $Mc2Hi = C2H * (H2 / 2)$
 $Mc1Vi = C1V * (B + C + (DM1 / 2))$
 $Mc2Vi = C2V * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi$
 $JEqVi = Eq1Vi + Eq2Vi$
 $JMqHi = Mq1Hi + Mq2Hi$
 $JMqVi = Mq1Vi + Mq2Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi$
 $JMaVi = Ma1Vi + Ma2Vi + Ma3Vi$
 $JCHi = C1Hi + C2Hi$
 $JCVi = C1Vi + C2Vi$
 $JMCHi = Mc1Hi + Mc2Hi$
 $JMCVi = Mc1Vi + Mc2Vi$

$EaVi = (JEqVi + JEaVi) - JCVi$
 $Eai = (JEqHi + JEaHi) - JCHi$
 $MaVi = (JMqVi + JMaVi) - JMCVi$

Mai = (JMqHi + JMaHi) - JMCHi
End Sub

Lapis 3
Sub Bal()
'Gaya Eksternal'
'Beban Merata Q'
QQ = Q
Du While QQ < 0
Eq1 = (Q * L1) * Ka1
Eq2 = (Q + L1 * Ga1) * L2 * Ka2
Eq3 = (Q + L1 * Ga1 + L2 * Ga2) * L3 * Ka3
Eq4 = (Q + L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * T2 * Ka3
QQ = 0
Loop
Eq1H = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Ea1
Eq2H = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2
Eq3H = (\cos((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea3
Eq4H = (\cos((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea4
Eq1V = (\sin((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Ea1
Eq2V = (\sin((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2
Eq3V = (\sin((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea3
Eq4V = (\sin((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea4
Mq1H = Ea1 * ((H1 / 2) + (H2 + H3 + T2))
Mq2H = Ea2 * ((H2 / 2) + (H3 + T2))
Mq3H = Ea3 * ((H3 / 2) + T2)
Mq4H = Ea4 * (T2 / 2)
Mq1V = Ea1 * (A + B + C + (DM1 / 2))
Mq2V = Ea2 * (A + B + C + (DM2 / 2))
Mq3V = Ea3 * (A + B + C + (D / 2))
Mq4V = Ea4 * (L)

'Beban Tanah'
Ea1 = 0.5 * (L1) ^ 2 * Ga1 * Ka1
Ea2 = ((L1 * Ga1) * Ka2) * L2
Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
Ea4 = ((L1 * Ga1 + L2 * Ga2) * Ka3) * L3
Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
Ea6 = ((L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * Ka3) * T2
Ea7 = 0.5 * (T2) ^ 2 * Ga3 * Ka3
Ea1H = (\cos((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Ea1
Ea2H = (\cos((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2

$Ea3H = (\text{Cos}((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6H = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7H = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea1V = (\text{Sin}((\Delta t_1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta t_2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + (H3 + T2))$
 $Ma3H = Ea3H * ((H2 / 3) + (H3 + T2))$
 $Ma4H = Ea4H * ((H3 / 2) + T2)$
 $Ma5H = Ea5H * ((H3 / 3) + T2)$
 $Ma6H = Ea6H * (T2 / 2)$
 $Ma7H = Ea7H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2))$
 $Ma4V = Ea4V * (A + B + C + (D / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * D))$
 $Ma6V = Ea6V * (L)$
 $Ma7V = Ea7V * (L)$

'Beban Air'

$\text{Pair} = 0.5 * (L1 + L2 + L3) ^ 2 * Gw$
 $\text{PairH} = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{PairV} = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{MairH} = \text{PairH} * (Hwt / 3)$
 $\text{MairV} = \text{PairV} * (L)$

'Cohesi Tanah'

$C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$

$C4 = T2 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta t_1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * C4$
 $C1V = (\text{Sin}((\Delta t_1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta t_2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta t_3 + \lambda) / (180 * 7 / 22))) * C4$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + T2))$
 $Mc3H = C3H * ((H3 / 2) + T2)$
 $Mc4H = C4H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (D / 2))$
 $Mc4V = C4V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V$
 $JCH = C1H + C2H + C3H + C4H$
 $JCV = C1V + C2V + C3V + C4V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V$

$EaV = (JEqV + JEaV) - JCV + \text{PairV}$
 $Ea = (JEqH + JEaH) - JCH + \text{PairH}$
 $MaV = (JMqV + JMaV) - JMCV + \text{MairV}$
 $Ma = (JMqH + JMaH) - JMCH + \text{MairH}$

'Gaya Internal'

'Beban Merata Q'

$QQ = Q$
 $\text{Do While } QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Ga1) * L2 * Ka2$
 $Eq3i = (Q + L1 * Ga1 + L2 * Ga2) * L3 *$

Ka3
 $QQ = 0$
Loop
 $Eq1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3))$
 $Mq2Hi = Eq2Hi * ((H2 / 2) + H3)$
 $Mq3Hi = Eq3Hi * (H3 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (D / 2))$

'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Ga1 * Ka1$
 $Ea2i = (L1 * Ga1) * Ka2 * L2$
 $Ea3i = 0.5 * L2 ^ 2 * Ga2 * Ka2$
 $Ea4i = (L1 * Ga1 + L2 * Ga2) * Ka3 * L3$
 $Ea5i = 0.5 * L3 ^ 2 * Ga3 * Ka3$
 $Ea1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea4Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea5Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea4Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea5Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5i$
 $Ma1Hi = Ea1Hi * ((H1 / 3) + (H2 + H3))$
 $Ma2Hi = Ea2Hi * ((H2 / 2) + H3)$
 $Ma3Hi = Ea3Hi * ((H2 / 3) + H3)$
 $Ma4Hi = Ea4Hi * (H3 / 2)$
 $Ma5Hi = Ea5Hi * (H3 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1))$

 $Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM2))$
 $Ma4Vi = Ea4Vi * (B + C + (D / 2))$
 $Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * D))$

'Beban Air'
 $Pairi = 0.5 * (L1 + L2 + L3) ^ 2 * Gw$
 $PairHi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Pairi$
 $PairVi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3))$
 $Mc2Hi = C2Hi * ((H2 / 2) + H3)$
 $Mc3Hi = C3Hi * (H3 / 2)$
 $Mc1Vi = C1Vi * (B + C + (DM1 / 2))$
 $Mc2Vi = C2Vi * (B + C + (DM2 / 2))$
 $Mc3Vi = C3Vi * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi$
 $+ Ea5Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi$
 $+ Ea5Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi + Ma4Hi + Ma5Hi$
 $JMaVi = Ma1Vi + Ma2Vi + Ma3Vi + Ma4Vi + Ma5Vi$
 $JCHi = C1Hi + C2Hi + C3Hi$
 $JCVi = C1Vi + C2Vi + C3Vi$
 $JMCHi = Mc1Hi + Mc2Hi + Mc3Hi$
 $JMCVi = Mc1Vi + Mc2Vi + Mc3Vi$
 $EaVi = (JEqVi + JEaVi) - JCVi + PairVi$

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Eai = (JEqHi + JEaHi) - JCHi + PairHi
MaVi = (JMqVi + JMaV) - JMCVi +
MairVi
Mai = (JMqHi + JMaH) - JMCHi + MairHi

End Sub
Sub Ba2()
  'Gaya Eksternal'
  'Beban Merata Q'
  QQ = Q
  Do While QQ <> 0
    Eq1 = Q * (L1 - Lw1) * Ka1
    Eq2 = (Q + (L1 - Lw1) * Gb1) * Lw1 *
    Ka1
    Eq3 = (Q + (L1 - Lw1) * Gb1 + Lw1 *
    Ga1) * L2 * Ka2
    Eq4 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1
    + L2 * Ga2) * L3 * Ka3
    Eq5 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1
    + L2 * Ga2 + L3 * Ga3) * T2 * Ka3
    QQ = 0
    Loop
    Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Eq1
    Eq2H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Eq2
    Eq3H = (Cos((Delta2 + lamda) / (180 * 7 /
    22))) * Eq3
    Eq4H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Eq4
    Eq5H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Eq5
    Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Eq1
    Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Eq2
    Eq3V = (Sin((Delta2 + lamda) / (180 * 7 /
    22))) * Eq3
    Eq4V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Eq4
    Eq5V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Eq5
    Mq1H = Eq1H * (((H1 - Hw1) / 2) + (Hw1
    + H2 + H3 + T2))
    Mq2H = Eq2H * ((Hw1 / 2) + (H2 + H3 +
    T2))
    Mq3H = Eq3H * ((H2 / 2) + (H3 + T2))
    Mq4H = Eq4H * ((H3 / 2) + T2)
    Mq5H = Eq5H * (T2 / 2)
    Mq1V = Eq1V * (A + B + C + (DM1a / 2))
    Mq2V = Eq2V * (A + B + C + (DM1 / 2))
    Mq3V = Eq3V * (A + B + C + (DM2 / 2))
    Mq4V = Eq4V * (A + B + C + (D / 2))
    Mq5V = Eq5V * (L)

'Beban Tanah'
Ea1 = 0.5 * (L1 - Lw1) ^ 2 * Gb1 * Ka1
Ea2 = ((L1 - Lw1) * Gb1 * Ka1) * Lw1
Ea3 = 0.5 * (Lw1) ^ 2 * Ga1 * Ka1
Ea4 = ((L1 - Lw1) * Gb1 + Lw1 * Ga1) *
    Ka2 * L2
Ea5 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
Ea6 = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 +
    L2 * Ga2) * Ka3 * L3
Ea7 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
Ea8 = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 +
    L2 * Ga2) * Ka3 * T2
Ea9 = 0.5 * (T2) ^ 2 * Ga3 * Ka3
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Ea1
Ea2H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Ea2
Ea3H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Ea3
Ea4H = (Cos((Delta2 + lamda) / (180 * 7 /
    22))) * Ea4
Ea5H = (Cos((Delta2 + lamda) / (180 * 7 /
    22))) * Ea5
Ea6H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Ea6
Ea7H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Ea7
Ea8H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Ea8
Ea9H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Ea9
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Ea1
Ea2V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Ea2
Ea3V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Ea3
Ea4V = (Sin((Delta2 + lamda) / (180 * 7 /
    22))) * Ea4
Ea5V = (Sin((Delta2 + lamda) / (180 * 7 /
    22))) * Ea5
Ea6V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Ea6
Ea7V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Ea7
Ea8V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Ea8
Ea9V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Ea9
Ma1H = Ea1H * (((H1 - Hw1) / 3) + (Hw1
    + H2 + H3 + T2))
Ma2H = Ea2H * ((Hw1 / 2) + (H2 + H3 +
    T2))
Ma3H = Ea3H * ((Hw1 / 3) + (H2 + H3 +
    T2))

```

$Ma4H = Ea4H * ((H2 / 2) + (H3 + T2))$
 $Ma5H = Ea5H * ((H2 / 3) + (H3 + T2))$
 $Ma6H = Ea6H * ((H3 / 2) + T2)$
 $Ma7H = Ea7H * ((H3 / 3) + T2)$
 $Ma8H = Ea8H * (T2 / 2)$
 $Ma9H = Ea9H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1a))$
 $Ma2V = Ea2V * (A + B + C + (DM1 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM1))$
 $Ma4V = Ea4V * (A + B + C + (DM2 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM2))$
 $Ma6V = Ea6V * (A + B + C + (D / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * D))$
 $Ma8V = Ea8V * (L)$
 $Ma9V = Ea9V * (L)$

'Beban Air'
 $Pair = 0.5 * (Lw1 + L2 + L3) ^ 2 * Gw$
 $PairH = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = T2 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C4$
 $C1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C4$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + T2))$
 $Mc3H = C3H * ((H3 / 2) + T2)$
 $Mc4H = C4H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$

 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (D / 2))$
 $Mc4V = C4V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V$
 $JCH = C1H + C2H + C3H + C4H$
 $JCV = C1V + C2V + C3V + C4V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V$

 $EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Internal'
'Beban Merata Q'
 $QQ = Q$
 $Do\ While\ QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + (L1 - Lw1) * Gb1) * Lw1 * Ka1$
 $Eq3i = (Q + ((L1 - Lw1) * Gb1) + Lw1 * Ga1) * L2 * Ka2$
 $Eq4i = (Q + ((L1 - Lw1) * Gb1) + Lw1 * Ga1 + L2 * Ga2) * L3 * Ka3$
 $QQ = 0$
 $Loop$
 $Eq1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$

$$\begin{aligned}
& 22))) * Eq3i \\
& Eq4Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 2))) * Eq4i \\
& Mq1Hi = Eq1Hi * (((H1 - Hw1) / 2) + (Hw1 + H2 + H3)) \\
& Mq2Hi = Eq2Hi * ((Hw1 / 2) + (H2 + H3)) \\
& Mq3Hi = Eq3Hi * ((H2 / 2) + H3) \\
& Mq4Hi = Eq4Hi * (H3 / 2) \\
& Mq1Vi = Eq1Vi * (B + C + (DM1a / 2)) \\
& Mq2Vi = Eq2Vi * (B + C + (DM1 / 2)) \\
& Mq3Vi = Eq3Vi * (B + C + (DM2 / 2)) \\
& Mq4Vi = Eq4Vi * (B + C + (D / 2))
\end{aligned}$$

'Beban Tanah'

$$\begin{aligned}
Eali &= 0.5 * L1 ^ 2 * Ga1 * Ka1 \\
Ea2i &= ((L1 - Lw1) * Gb1) * Kal * Lw1 \\
Ea3i &= 0.5 * (Lw1) ^ 2 * Ga2 * Ka2 \\
Ea4i &= ((L1 - Lw1) * Gb1 + Lw1 * Gal) * Ka2 * L2 \\
Ea5i &= 0.5 * L2 ^ 2 * Ga3 * Ka3 \\
Ea6i &= ((L1 - Lw1) * Gb1 + Lw1 * Gal + L2 * Ga2) * Ka3 * L3 \\
Ea7i &= 0.5 * L3 ^ 2 * Ga3 * Ka3 \\
Ea1Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / 2))) * Eali \\
Ea2Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / 2))) * Ea2i \\
Ea3Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea3i \\
Ea4Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea4i \\
Ea5Hi &= (\cos((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea5i \\
Ea6Hi &= (\cos((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea6i \\
Ea7Hi &= (\cos((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea7i \\
Ea1Vi &= (\sin((\Delta1 + \lambda) / (180 * 7 / 2))) * Eali \\
Ea2Vi &= (\sin((\Delta1 + \lambda) / (180 * 7 / 2))) * Ea2i \\
Ea3Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea3i \\
Ea4Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea4i \\
Ea5Vi &= (\sin((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea5i \\
Ea6Vi &= (\sin((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea6i \\
Ea7Vi &= (\sin((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea7i \\
Ma1Hi &= Eq1Hi * (((H1 - Hw1) / 3) + (Hw1 + H2 + H3)) \\
Ma2Hi &= Eq2Hi * ((Hw1 / 2) + (H2 + H3)) \\
Ma3Hi &= Eq3Hi * ((Hw1 / 3) + (H2 + H3))
\end{aligned}$$

$$\begin{aligned}
Ma4Hi &= Eq4Hi * ((H2 / 2) + H3) \\
Ma5Hi &= Eq5Hi * ((H2 / 3) + H3) \\
Ma6Hi &= Eq6Hi * (H3 / 2) \\
Ma7Hi &= Eq7Hi * (H3 / 3) \\
Ma1Vi &= Eq1Vi * (B + C + ((1 / 3) * DM1a)) \\
Ma2Vi &= Eq2Vi * (B + C + (DM1 / 2)) \\
Ma3Vi &= Eq3Vi * (B + C + ((1 / 3) * DM1)) \\
Ma4Vi &= Eq4Vi * (B + C + (DM2 / 2)) \\
Ma5Vi &= Eq5Vi * (B + C + ((1 / 3) * DM2)) \\
Ma6Vi &= Eq6Vi * (B + C + (D / 2)) \\
Ma7Vi &= Eq7Vi * (B + C + ((1 / 3) * D))
\end{aligned}$$

'Beban Air'

$$\begin{aligned}
Pairi &= 0.5 * (Lw1 + L2 + L3) ^ 2 * Gw \\
PairHi &= (\cos((\Delta3 + \lambda) / (180 * 7 / 2))) * Pairi \\
PairVi &= (\sin((\Delta3 + \lambda) / (180 * 7 / 2))) * Pairi \\
MairHi &= PairHi * (Hwt / 3) \\
MairVi &= PairVi * (B + C + ((1 / 3) * D))
\end{aligned}$$

'Cohesi'

$$\begin{aligned}
C1i &= L1 * 2 * Ch1 * ((Ka1) ^ 0.5) \\
C2i &= L2 * 2 * Ch2 * ((Ka2) ^ 0.5) \\
C3i &= L3 * 2 * Ch3 * ((Ka3) ^ 0.5) \\
C1Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / 2))) * C1i \\
C2Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / 2))) * C2i \\
C3Hi &= (\cos((\Delta3 + \lambda) / (180 * 7 / 2))) * C3i \\
C1Vi &= (\sin((\Delta1 + \lambda) / (180 * 7 / 2))) * C1i \\
C2Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / 2))) * C2i \\
C3Vi &= (\sin((\Delta3 + \lambda) / (180 * 7 / 2))) * C3i \\
Mc1Hi &= C1Hi * ((H1 / 2) + (H2 + H3)) \\
Mc2Hi &= C2Hi * ((H2 / 2) + H3) \\
Mc3Hi &= C3Hi * (H3 / 2) \\
Mc1Vi &= C1Vi * (B + C + (DM1 / 2)) \\
Mc2Vi &= C2Vi * (B + C + (DM2 / 2)) \\
Mc3Vi &= C3Vi * (B + C + (D / 2)) \\
JEqHi &= Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi \\
JEqVi &= Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi \\
JMqHi &= Mq1Hi + Mq2Hi + Mq3Hi + Mq4Hi \\
JMqVi &= Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi \\
JEaVi &= Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi \\
&+ Ea5Vi + Ea6Vi + Ea7Vi \\
JEaHi &= Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi
\end{aligned}$$

+ Ea5Hi + Ea6Hi + Ea7Hi
 JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +
 Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi
 JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
 Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi
 JCHi = C1Hi + C2Hi + C3Hi
 JCVi = C1Vi + C2Vi + C3Vi
 JMCHi = Mc1Hi + Mc2Hi + Mc3Hi
 JMCVi = Mc1Vi + Mc2Vi + Mc3Vi

 EaVi = (JEqVi + JEaVi) - JCVi + PairVi
 Eai = (JEqHi + JEaHi) - JCHi + PairHi
 MaVi = (JEqVi + JMaVi) - JMCVi +
 MairVi
 Mai = (JEqHi + JMaHi) - JMCHi + MairHi
 End Sub
 Sub Ba3()
 'Gaya Eksternal'
 'Beban Merata Q'
 QQ = Q
 Do While QQ < 0
 Eq1 = (Q * L1) * Ka1
 Eq2 = (Q + L1 * Gb1) * L2 * Ka2
 Eq3 = (Q + L1 * Gb1 + L2 * Ga2) * L3 *
 Ka3
 Eq4 = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
 Ga3) * T2 * Ka3
 QQ = 0
 Loop
 Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1
 Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
 22))) * Eq2
 Eq3H = (Cos((Delta3 + lamda) / (180 * 7 /
 22))) * Eq3
 Eq4H = (Cos((Delta3 + lamda) / (180 * 7 /
 22))) * Eq4
 Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1
 Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
 22))) * Eq2
 Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
 22))) * Eq3
 Eq4V = (Sin((Delta3 + lamda) / (180 * 7 /
 22))) * Eq4
 Mq1H = Eq1 * ((H1 / 2) + (H2 + H3 + T2))
 Mq2H = Eq2 * ((H2 / 2) + (H3 + T2))
 Mq3H = Eq3 * ((H3 / 2) + T2)
 Mq4H = Eq4 * (T2 / 2)
 Mq1V = Eq1 * (A + B + C + (DM1 / 2))
 Mq2V = Eq2 * (A + B + C + (DM2 / 2))
 Mq3V = Eq3 * (A + B + C + (D / 2))
 Mq4V = Eq4 * (L)

 'Beban Tanah'
 Ea1 = 0.5 * L1 ^ 2 * Gb1 * Ka1
 Ea2 = ((L1 * Gb1) * Ka2) * L2
 Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
 Ea4 = ((L1 * Gb1 + L2 * Ga2) * Ka3) * L3
 Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
 Ea6 = ((L1 * Gb1 + L2 * Ga2 + L3 * Ga3)
 * Ka3) * T2
 Ea7 = 0.5 * (T2) ^ 2 * Ga3 * Ka3
 Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
 22))) * Ea1
 Ea2H = (Cos((Delta2 + lamda) / (180 * 7 /
 22))) * Ea2
 Ea3H = (Cos((Delta3 + lamda) / (180 * 7 /
 22))) * Ea3
 Ea4H = (Cos((Delta4 + lamda) / (180 * 7 /
 22))) * Ea4
 Ea5H = (Cos((Delta5 + lamda) / (180 * 7 /
 22))) * Ea5
 Ea6H = (Cos((Delta6 + lamda) / (180 * 7 /
 22))) * Ea6
 Ea7H = (Cos((Delta7 + lamda) / (180 * 7 /
 22))) * Ea7
 Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
 22))) * Ea1
 Ea2V = (Sin((Delta2 + lamda) / (180 * 7 /
 22))) * Ea2
 Ea3V = (Sin((Delta3 + lamda) / (180 * 7 /
 22))) * Ea3
 Ea4V = (Sin((Delta4 + lamda) / (180 * 7 /
 22))) * Ea4
 Ea5V = (Sin((Delta5 + lamda) / (180 * 7 /
 22))) * Ea5
 Ea6V = (Sin((Delta6 + lamda) / (180 * 7 /
 22))) * Ea6
 Ea7V = (Sin((Delta7 + lamda) / (180 * 7 /
 22))) * Ea7
 Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 +
 T2))
 Ma2H = Ea2H * ((H2 / 2) + (H3 + T2))
 Ma3H = Ea3H * ((H2 / 3) + (H3 + T2))
 Ma4H = Ea4H * ((H3 / 2) + T2)
 Ma5H = Ea5H * ((H3 / 3) + T2)
 Ma6H = Ea6H * (T2 / 2)
 Ma7H = Ea7H * (T2 / 3)
 Ma1V = Ea1V * (A + B + C + ((1 / 3) *
 DM1))
 Ma2V = Ea2V * (A + B + C + (DM2 / 2))
 Ma3V = Ea3V * (A + B + C + ((1 / 3) *
 DM2))
 Ma4V = Ea4V * (A + B + C + (D / 2))
 Ma5V = Ea5V * (A + B + C + ((1 / 3) * D))
 Ma6V = Ea6V * (L)
 Ma7V = Ea7V * (L)

'Beban Air'

$\text{Pair} = 0.5 * (\text{Hwt})^2 * \text{Gw}$
 $\text{PairH} = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{PairV} = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{MairH} = \text{Pair} * (\text{Hwt} / 3)$
 $\text{MairV} = \text{Pair} * (\text{L})$

'Cohesi Tanah'

$C1 = L1 * 2 * Ch1 * ((Ka1)^0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2)^0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3)^0.5)$
 $C4 = T2 * 2 * Ch3 * ((Ka3)^0.5)$
 $C1H = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * C4$
 $C1V = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * C4$

$Mc1H = C1H * ((H1 / 2) + (H2 + H3 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + T2))$
 $Mc3H = C3H * ((H3 / 2) + T2)$
 $Mc4H = C4H * (T2 / 2)$

$Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (D / 2))$
 $Mc4V = C4V * (L)$

$JEqH = Eq1H + Eq2H + Eq3H + Eq4H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V +$
 $Ea5V + Ea6V + Ea7V$

$JEaH = Ea1H + Ea2H + Ea3H + Ea4H +$
 $Ea5H + Ea6H + Ea7H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H +$
 $Ma5H + Ma6H + Ma7H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V +$
 $Ma5V + Ma6V + Ma7V$

$JCH = C1H + C2H + C3H + C4H$
 $JCV = C1V + C2V + C3V + C4V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Internal'

$'Beban Merata Q'$
 $QQ = Q$
 $Do While QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Gb1) * L2 * Ka2$
 $Eq3i = (Q + L1 * Gb1 + L2 * Ga2) * L3 * Ka3$
 $QQ = 0$
 $Loop$
 $Eq1Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq1Vi = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3))$
 $Mq2Hi = Eq2Hi * ((H2 / 2) + H3)$
 $Mq3Hi = Eq3Hi * (H3 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (D / 2))$

'Beban Tanah'

$Eali = 0.5 * L1^2 * Gb1 * Ka1$
 $Ea2i = (L1 * Gb1) * Ka2 * L2$
 $Ea3i = 0.5 * L2^2 * Ga2 * Ka2$
 $Ea4i = (L1 * Gb1 + L2 * Ga2) * Ka3 * L3$
 $Ea5i = 0.5 * L3^2 * Ga3 * Ka3$
 $Ea1Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Eali$
 $Ea2Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea4Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea5Hi = (\text{Cos}((\Delta t + \lambda) / (180 * 7 / 22))) * Ea5i$
 $Ea1Vi = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * Eali$
 $Ea2Vi = (\text{Sin}((\Delta t + \lambda) / (180 * 7 / 22))) * Ea2i$

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Ea4Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea4i
Ea5Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea5i
Ma1Hi = Ea1Hi * ((H1 / 3) + (H2 + H3))
Ma2Hi = Ea2Hi * ((H2 / 2) + H3)
Ma3Hi = Ea3Hi * ((H2 / 3) + H3)
Ma4Hi = Ea4Hi * (H3 / 2)
Ma5Hi = Ea5Hi * (H3 / 3)
Ma1Vi = Ea1Vi * (B + C + ((1 / 3) *
DM1))
Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))
Ma3Vi = Ea3Vi * (B + C + ((1 / 3) *
DM2))
Ma4Vi = Ea4Vi * (B + C + (D / 2))
Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * D))

'Cohesi'
C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)
C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)
C1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * C2i
C3Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * C3i
C1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * C2i
C3Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * C3i
Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3))
Mc2Hi = C2Hi * ((H2 / 2) + H3)
Mc3Hi = C3Hi * (H3 / 2)
Mc1Vi = C1Vi * (B + C + (DM1 / 2))
Mc2Vi = C2Vi * (B + C + (DM2 / 2))
Mc3Vi = C3Vi * (B + C + (D / 2))
JEqHi = Eq1Hi + Eq2Hi + Eq3Hi
JEqVi = Eq1Vi + Eq2Vi + Eq3Vi
JMqHi = Mq1Hi + Mq2Hi + Mq3Hi
JMqVi = Mq1Vi + Mq2Vi + Mq3Vi
JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi +
Ea5Vi
JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi +
Ea5Hi
JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +
Ma4Hi + Ma5Hi
JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi
JCHi = C1Hi + C2Hi + C3Hi
JCVi = C1Vi + C2Vi + C3Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi

EaVi = (JEqVi + JEaVi) - JCVi
Eai = (JEqHi + JEaHi) - JCHi
MaVi = (JMqVi + JMaVi) - JMCVi
Mai = (JMqHi + JMaHi) - JMCHi

End Sub
Sub Parameter()
On Error Resume Next
Q = Q.Text
T1 = T1.Text
gpas = gpas.Text
Phil = Text1.Text
Ch1 = Text2.Text
H1 = Text3.Text
Delta1 = Text4.Text
Phi2 = Text5.Text
Ch2 = Text6.Text
H2 = Text7.Text
Delta2 = Text8.Text
Phi3 = Text9.Text
Ch3 = Text10.Text
H3 = Text11.Text
Delta3 = Text12.Text
Hwt = Hwt.Text
alfa = (Atn(T1 / D)) * (180 * (7 / 22))
lamda = (180 - (90 + alfa))
L = (A + B + C + D + E)
Lt = ((T1 ^ 2) + (D ^ 2)) ^ (0.5)
Ht = T1 + T2
L1 = (H1 / (Cos(lamda / (180 * 7 / 22))))
L2 = (H2 / (Cos(lamda / (180 * 7 / 22))))
L3 = (H3 / (Cos(lamda / (180 * 7 / 22))))
DM1 = ((H1 * D) / T1)
DM2 = (H2 * D) / T1
Ka1 = ((Sin((alfa + Phi1) / (180 * 7 / 22)))
^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
(Sin((alfa - Delta1) / (180 * 7 / 22)))) * (1 +
(((Sin((Phi1 + Delta1) / (180 * 7 / 22))) *
(Sin(Phi1 / (180 * 7 / 22)))) / ((Sin((alfa -
Delta1) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
22)))) ^ 0.5)) ^ 2)
Ka2 = ((Sin((alfa + Phi2) / (180 * 7 / 22)))
^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
(Sin((alfa - Delta2) / (180 * 7 / 22)))) * (1 +
(((Sin((Phi2 + Delta2) / (180 * 7 / 22))) *
(Sin(Phi2 / (180 * 7 / 22)))) / ((Sin((alfa -
Delta2) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
22)))) ^ 0.5)) ^ 2)
Ka3 = ((Sin((alfa + Phi3) / (180 * 7 / 22)))
^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
(Sin((alfa - Delta3) / (180 * 7 / 22)))) * (1 +
(((Sin((Phi3 + Delta3) / (180 * 7 / 22))) *
(Sin(Phi3 / (180 * 7 / 22)))) / ((Sin((alfa -
Delta3) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
22)))) ^ 0.5)) ^ 2)

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/ 22)))))) ^ 0.5)) ^ 2)
Kp = ((Sin((alfa - Phi3) / (180 * 7 / 22))) ^
2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
(Sin((alfa + Delta3) / (180 * 7 / 22)))) * (1 -
(((Sin((Phi3 + Delta3) / (180 * 7 / 22))) *
(Sin(Phi3 / (180 * 7 / 22)))) / ((Sin((alfa +
Delta3) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
22)))))) ^ 0.5)) ^ 2)
End Sub

```

Lapis4

Sub Ba1()

'Gaya Eksternal'

'Beban Merata Q'

QQ = Q

Do While QQ <> 0

Eq1 = (Q * L1) * Ka1

Eq2 = (Q + L1 * Ga1) * L2 * Ka2

Eq3 = (Q + L1 * Ga1 + L2 * Ga2) * L3 *

Ka3

Eq4 = (Q + L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * L4 * Ka4

Eq5 = (Q + L1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * T2 * Ka4

QQ = 0

Loop

Eq1H = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Eq1

Eq2H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Eq2

Eq3H = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Eq3

Eq4H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Eq4

Eq5H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Eq5

Eq1V = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Eq1

Eq2V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Eq2

Eq3V = (Sin((Delta3 + lamda) / (180 * 7 / 22))) * Eq3

Eq4V = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Eq4

Eq5V = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Eq5

Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 + H4 + T2))

Mq2H = Eq2H * ((H2 / 2) + (H3 + H4 + T2))

Mq3H = Eq3H * ((H3 / 2) + (H4 + T2))

Mq4H = Eq4H * ((H4 / 2) + T2)

Mq5H = Eq5H * (T2 / 2)

Mq1V = Eq1V * (A + B + C + (DM1 / 2))

Mq2V = Eq2V * (A + B + C + (DM2 / 2))

Mq3V = Eq3V * (A + B + C + (DM3 / 2))

Mq4V = Eq4V * (A + B + C + (D / 2))

Mq5V = Eq5V * (L)

'Beban Tanah'

Ea1 = 0.5 * (L1) ^ 2 * Ga1 * Ka1

Ea2 = (L1 * Ga1) * Ka2 * L2

Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2

Ea4 = (L1 * Ga1 + L2 * Ga2) * Ka3 * L3

Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3

Ea6 = ((L1 * Ga1 + L2 * Ga2 + L3 * Ga3) *

* Ka4) * L4

Ea7 = 0.5 * (L4) ^ 2 * Ga4 * Ka4

Ea8 = ((L1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka4) * (T2)

Ea9 = 0.5 * (T2) ^ 2 * Ga4 * Ka4

Ea1H = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Ea1

Ea2H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea2

Ea3H = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Ea3

Ea4H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea4

Ea5H = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Ea5

Ea6H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea6

Ea7H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea7

Ea8H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea8

Ea9H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea9

Ea1V = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Ea1

Ea2V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea2

Ea3V = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea3

Ea4V = (Sin((Delta3 + lamda) / (180 * 7 / 22))) * Ea4

Ea5V = (Sin((Delta3 + lamda) / (180 * 7 / 22))) * Ea5

Ea6V = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Ea6

Ea7V = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Ea7

Ea8V = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Ea8

Ea9V = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Ea9

Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + T2))

Ma2H = Ea2H * ((H2 / 2) + (H3 + H4 +

T2))
 $Ma3H = Ea3H * ((H2 / 3) + (H3 + H4 + T2))$
 $Ma4H = Ea4H * ((H3 / 2) + (H4 + T2))$
 $Ma5H = Ea5H * ((H3 / 3) + (H4 + T2))$
 $Ma6H = Ea6H * ((H4 / 2) + T2)$
 $Ma7H = Ea7H * ((H4 / 3) + T2)$
 $Ma8H = Ea8H * (T2 / 2)$
 $Ma9H = Ea9H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2))$
 $Ma4V = Ea4V * (A + B + C + (DM3 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM3))$
 $Ma6V = Ea6V * (A + B + C + (D / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * D))$
 $Ma8V = Ea8V * (L)$
 $Ma9V = Ea9V * (L)$

'Beban Air'
 $Pair = 0.5 * (L1 + L2 + L3 + L4 + T2) ^ 2 * Gw$
 $PairH = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = T2 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $C1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$

22))) * C4
 $C5V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + T2))$
 $Mc4H = C4H * ((H4 / 2) + T2)$
 $Mc5H = C5H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (D / 2))$
 $Mc5V = C5V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V$
 $JCH = C1H + C2H + C3H + C4H$
 $JCV = C1V + C2V + C3V + C4V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V$

EaV = (JEqV + JEaV) - JCV + PairV
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCH + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Eksternal'
'Beban Merata Q'
 $QQ = Q$
Do While $QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Ga1) * L2 * Ka2$
 $Eq3i = (Q + L1 * Ga1 + L2 * Ga2) * L3 * Ka3$
 $Eq4i = (Q + L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * L4 * Ka4$
 $QQ = 0$
Loop
 $Eq1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$

$\text{Eq2Hi} = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Eq2i}$
 $\text{Eq3Hi} = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{Eq3i}$
 $\text{Eq4Hi} = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Eq4i}$
 $\text{Eq1Vi} = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * \text{Eq1i}$
 $\text{Eq2Vi} = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Eq2i}$
 $\text{Eq3Vi} = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{Eq3i}$
 $\text{Eq4Vi} = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Eq4i}$
 $\text{Mq1Hi} = \text{Eq1Hi} * ((H1 / 2) + (H2 + H3 + H4))$
 $\text{Mq2Hi} = \text{Eq2Hi} * ((H2 / 2) + (H3 + H4))$
 $\text{Mq3Hi} = \text{Eq3Hi} * ((H3 / 2) + H4)$
 $\text{Mq4Hi} = \text{Eq4Hi} * (H4 / 2)$
 $\text{Mq1Vi} = \text{Eq1Vi} * (B + C + (\text{DM1} / 2))$
 $\text{Mq2Vi} = \text{Eq2Vi} * (B + C + (\text{DM2} / 2))$
 $\text{Mq3Vi} = \text{Eq3Vi} * (B + C + (\text{DM3} / 2))$
 $\text{Mq4Vi} = \text{Eq4Vi} * (B + C + (D / 2))$

'Beban Tanah'

$\text{Eali} = 0.5 * L1 ^ 2 * Ga1 * Ka1$
 $\text{Ea2i} = (L1 * Ga1) * Ka2 * L2$
 $\text{Ea3i} = 0.5 * L2 ^ 2 * Ga2 * Ka2$
 $\text{Ea4i} = (L1 * Ga1 + L2 * Ga2) * Ka3 * L3$
 $\text{Ea5i} = 0.5 * L3 ^ 2 * Ga3 * Ka3$
 $\text{Ea6i} = (L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * Ka4 * L4$
 $\text{Ea7i} = 0.5 * L4 ^ 2 * Ga4 * Ka4$
 $\text{Ea1Hi} = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * \text{Ea1i}$
 $\text{Ea2Hi} = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Ea2i}$
 $\text{Ea3Hi} = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Ea3i}$
 $\text{Ea4Hi} = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{Ea4i}$
 $\text{Ea5Hi} = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{Ea5i}$
 $\text{Ea6Hi} = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Ea6i}$
 $\text{Ea7Hi} = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Ea7i}$
 $\text{Ea1Vi} = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * \text{Ea1i}$
 $\text{Ea2Vi} = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Ea2i}$
 $\text{Ea3Vi} = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{Ea3i}$
 $\text{Ea4Vi} = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{Ea4i}$

$\text{Ea5Vi} = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{Ea5i}$
 $\text{Ea6Vi} = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Ea6i}$
 $\text{Ea7Vi} = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Ea7i}$
 $\text{Ma1Hi} = \text{Ea1Hi} * ((H1 / 3) + (H2 + H3 + H4))$
 $\text{Ma2Hi} = \text{Ea2Hi} * ((H2 / 2) + (H3 + H4))$
 $\text{Ma3Hi} = \text{Ea3Hi} * ((H2 / 3) + (H3 + H4))$
 $\text{Ma4Hi} = \text{Ea4Hi} * ((H3 / 2) + H4)$
 $\text{Ma5Hi} = \text{Ea5Hi} * ((H3 / 3) + H4)$
 $\text{Ma6Hi} = \text{Ea6Hi} * (H4 / 2)$
 $\text{Ma7Hi} = \text{Ea7Hi} * (H4 / 3)$
 $\text{Ma1Vi} = \text{Ea1Vi} * (B + C + ((1 / 3) * \text{DM1}))$
 $\text{Ma2Vi} = \text{Ea2Vi} * (B + C + (\text{DM2} / 2))$
 $\text{Ma3Vi} = \text{Ea3Vi} * (B + C + ((1 / 3) * \text{DM2}))$
 $\text{Ma4Vi} = \text{Ea4Vi} * (B + C + (\text{DM3} / 2))$
 $\text{Ma5Vi} = \text{Ea5Vi} * (B + C + ((1 / 3) * \text{DM3}))$
 $\text{Ma6Vi} = \text{Ea6Vi} * (B + C + (D / 2))$
 $\text{Ma7Vi} = \text{Ea7Vi} * (B + C + ((1 / 3) * D))$

'Beban Air'

$\text{Pairi} = 0.5 * (L1 + L2 + L3 + L4) ^ 2 * Gw$
 $\text{PairHi} = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Pairi}$
 $\text{PairVi} = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Pairi}$
 $\text{MairHi} = \text{PairHi} * (Hwt / 3)$
 $\text{MairVi} = \text{PairVi} * (B + C + ((1 / 3) * D))$

'Cohesi'

$\text{C1i} = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $\text{C2i} = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $\text{C3i} = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $\text{C4i} = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $\text{C1Hi} = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * \text{C1i}$
 $\text{C2Hi} = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{C2i}$
 $\text{C3Hi} = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{C3i}$
 $\text{C4Hi} = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{C4i}$
 $\text{C1Vi} = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * \text{C1i}$
 $\text{C2Vi} = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * \text{C2i}$
 $\text{C3Vi} = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * \text{C3i}$
 $\text{C4Vi} = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{C4i}$

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Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4))
Mc2Hi = C2Hi * ((H2 / 2) + (H3 + H4))
Mc3Hi = C3Hi * ((H3 / 2) + H4)
Mc4Hi = C4Hi * (H4 / 2)
Mc1Vi = C1Vi * (B + C + (DM1 / 2))
Mc2Vi = C2Vi * (B + C + (DM2 / 2))
Mc3Vi = C3Vi * (B + C + (DM3 / 2))
Mc4Vi = C4Vi * (B + C + (D / 2))
JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi
JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi
JMqHi = Mq1Hi + Mq2Hi + Mq3Hi +
Mq4Hi
JMqVi = Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi
JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi +
Ea5Vi + Ea6Vi + Ea7Vi
JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi +
Ea5Hi + Ea6Hi + Ea7Hi
JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +
Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi
JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi
JCHi = C1Hi + C2Hi + C3Hi + C4Hi
JCVi = C1Vi + C2Vi + C3Vi + C4Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +
Mc4Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi + Mc4Vi
EaVi = (JEqVi + JEaVi) - JCVi + PairVi
Eai = (JEqHi + JEaHi) - JCHi + PairHi
MaVi = (JMqVi + JMaVi) - JMCVi +
MairVi
Mai = (JMqHi + JMaHi) - JMCHi + MairHi
End Sub
Sub Ba2()
  'Gaya Eksternal'
  'Beban Merata Q'
  QQ = Q
  Do While QQ <> 0
    Eq1 = Q * (L1 - Lw1) * Kal
    Eq2 = (Q + (L1 - Lw1) * Gb1) * Lw1 *
    Kal
    Eq3 = (Q + (L1 - Lw1) * Gb1 + Lw1 *
    Ga1) * L2 * Ka2
    Eq4 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Gal
    + L2 * Ga2) * L3 * Ka3
    Eq5 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Gal
    + L2 * Ga2 + L3 * Ga3) * L4 * Ka4
    Eq6 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Gal
    + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * T2 *
    Ka4
    QQ = 0
    Loop
    Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Eq1
    Eq2H = (Cos((Delta1 + lamda) / (180 * 7 /
    22))) * Eq2
    Eq3H = (Cos((Delta2 + lamda) / (180 * 7 /
    22))) * Eq3
    Eq4H = (Cos((Delta3 + lamda) / (180 * 7 /
    22))) * Eq4
    Eq5H = (Cos((Delta4 + lamda) / (180 * 7 /
    22))) * Eq5
    Eq6H = (Cos((Delta4 + lamda) / (180 * 7 /
    22))) * Eq6
    Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Eq1
    Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
    22))) * Eq2
    Eq3V = (Sin((Delta2 + lamda) / (180 * 7 /
    22))) * Eq3
    Eq4V = (Sin((Delta3 + lamda) / (180 * 7 /
    22))) * Eq4
    Eq5V = (Sin((Delta4 + lamda) / (180 * 7 /
    22))) * Eq5
    Eq6V = (Sin((Delta4 + lamda) / (180 * 7 /
    22))) * Eq6
    Mq1H = Eq1H * (((H1 - Hw1) / 2) + (Hw1
    + H2 + H3 + H4 + T2))
    Mq2H = Eq2H * ((Hw1 / 2) + (H2 + H3 +
    H4 + T2))
    Mq3H = Eq3H * ((H2 / 2) + (H3 + H4 +
    T2))
    Mq4H = Eq4H * ((H3 / 2) + (H4 + T2))
    Mq5H = Eq5H * ((H4 / 2) + T2)
    Mq6H = Eq6H * (T2 / 2)
    Mq1V = Eq1V * (A + B + C + (DM1a / 2))
    Mq2V = Eq2V * (A + B + C + (DM1 / 2))
    Mq3V = Eq3V * (A + B + C + (DM2 / 2))
    Mq4V = Eq4V * (A + B + C + (DM3 / 2))
    Mq5V = Eq5V * (A + B + C + (D / 2))
    Mq6V = Eq6V * (L)

  Beban Tanah'
  Ea1 = 0.5 * (L1 - Lw1) ^ 2 * Gb1 * Kal
  Ea2 = ((L1 - Lw1) * Gb1) * Kal * Lw1
  Ea3 = 0.5 * (Lw1) ^ 2 * Gal * Kal
  Ea4 = ((L1 - Lw1) * Gb1 + Lw1 * Gal) *
  Ka2 * L2
  Ea5 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
  Ea6 = ((L1 - Lw1) * Gb1 + Lw1 * Gal +
  L2 * Ga2) * Ka3 * L3
  Ea7 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
  Ea8 = ((L1 - Lw1) * Gb1 + Lw1 * Gal +
  L2 * Ga2 + L3 * Ga3) * Ka4 * L4
  Ea9 = 0.5 * (L4) ^ 2 * Ga4 * Ka4
  Ea10 = ((L1 - Lw1) * Gb1 + Lw1 * Gal +
  L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka4 * T2
  Ea11 = 0.5 * (T2) ^ 2 * Ga4 * Ka4
  Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
  22))) * Ea1

```

$Ea2H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ea1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq11$
 $Ma1H = Eq1H * (((H1 - Hw1) / 3) + (H2 + H3 + H4 + T2))$
 $Ma2H = Eq2H * ((Hw1 / 2) + (H2 + H3 + H4 + T2))$
 $Ma3H = Eq3H * ((Hw1 / 3) + (H2 + H3 + H4 + T2))$
 $Ma4H = Eq4H * ((H2 / 2) + (H3 + H4 + T2))$
 $Ma5H = Eq5H * ((H2 / 3) + (H3 + H4 + T2))$
 $Ma6H = Eq6H * ((H3 / 2) + (H4 + T2))$
 $Ma7H = Eq7H * ((H3 / 3) + (H4 + T2))$
 $Ma8H = Eq8H * ((H4 / 2) + T2)$
 $Ma9H = Eq9H * ((H4 / 3) + T2)$
 $Ma10H = Eq10H * (T2 / 2)$
 $Ma11H = Eq11H * (T2 / 3)$
 $Ma1V = Eq1V * (A + B + C + ((1 / 3) * DM1a))$
 $Ma2V = Eq2V * (A + B + C + (DM1 / 2))$
 $Ma3V = Eq3V * (A + B + C + ((1 / 3) * DM1))$
 $Ma4V = Eq4V * (A + B + C + (DM2 / 2))$
 $Ma5V = Eq5V * (A + B + C + ((1 / 3) * DM2))$
 $Ma6V = Eq6V * (A + B + C + (DM3 / 2))$
 $Ma7V = Eq7V * (A + B + C + ((1 / 3) * DM3))$
 $Ma8V = Eq8V * (A + B + C + (D / 2))$
 $Ma9V = Eq9V * (A + B + C + ((1 / 3) * D))$
 $Ma10V = Eq10V * (L)$
 $Ma11V = Eq11V * (L)$

'Beban Air'
 $Pair = 0.5 * (Lw1 + L2 + L3 + L4 + T2) ^ 2$
 $* Gw$
 $PairH = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = T2 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $C1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$

$22))) * C5$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + T2))$
 $Mc4H = C4H * ((H4 / 2) + T2)$
 $Mc5H = C5H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (D / 2))$
 $Mc5V = C5V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V$
 $JCH = C1H + C2H + C3H + C4H + C5H$
 $JCV = C1V + C2V + C3V + C4V + C5V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V$
 $EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Internal'
'Beban Merata Q'
 $QQ = Q$
Do While QQ < 0
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + (L1 - Lw1) * Gb1) * Lw1 * Ka1$
 $Eq3i = (Q + ((L1 - Lw1) * Gb1) + Lw1 * Gb1) * L2 * Ka2$
 $Eq4i = (Q + ((L1 - Lw1) * Gb1) + Lw1 * Gb1) * L3 * Ka3$
 $Eq5i = (Q + ((L1 - Lw1) * Gb1) + Lw1 * Gb1) * L4 * Ka4$
 $QQ = 0$
Loop
 $Eq1Hi = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Hi = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Eq1Vi = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Vi = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Vi = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Mq1Hi = Eq1Hi * (((H1 - Hw1) / 2) + (Hw1 + H2 + H3 + H4))$
 $Mq2Hi = Eq2Hi * (((Hw1 / 2) + (H2 + H3 + H4))$
 $Mq3Hi = Eq3Hi * ((H2 / 2) + (H3 + H4))$
 $Mq4Hi = Eq4Hi * ((H3 / 2) + H4)$
 $Mq5Hi = Eq5Hi * (H4 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1a / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM1 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (DM2 / 2))$
 $Mq4Vi = Eq4Vi * (B + C + (DM3 / 2))$
 $Mq5Vi = Eq5Vi * (B + C + (D / 2))$

'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Ga1 * Ka1$
 $Ea2i = ((L1 - Lw1) * Gb1) * Ka1 * Lw1$
 $Ea3i = 0.5 * (Lw1) ^ 2 * Ga2 * Ka2$
 $Ea4i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1) * Ka2 * L2$
 $Ea5i = 0.5 * L2 ^ 2 * Ga3 * Ka3$
 $Ea6i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2) * Ka3 * L3$
 $Ea7i = 0.5 * L3 ^ 2 * Ga4 * Ka4$
 $Ea8i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2 + L3 * Ga3) * Ka4 * L4$
 $Ea9i = 0.5 * L4 ^ 2 * Ga4 * Ka4$
 $Ea1Hi = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Hi = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea2i$

$Ea3Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea4Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea5Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea5i$
 $Ea6Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6i$
 $Ea7Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea7i$
 $Ea8Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8i$
 $Ea9Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eali$
 $Ea2Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea4Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea5Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea5i$
 $Ea6Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6i$
 $Ea7Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea7i$
 $Ea8Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8i$
 $Ea9Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9i$
 $Ma1Hi = Ea1Hi * (((H1 - Hw1) / 3) + (Hw1 + H2 + H3 + H4))$
 $Ma2Hi = Ea2Hi * ((Hw1 / 2) + (H2 + H3 + H4))$
 $Ma3Hi = Ea3Hi * ((Hw1 / 3) + (H2 + H3 + H4))$
 $Ma4Hi = Ea4Hi * ((H2 / 2) + (H3 + H4))$
 $Ma5Hi = Ea5Hi * ((H2 / 3) + (H3 + H4))$
 $Ma6Hi = Ea6Hi * ((H3 / 2) + H4)$
 $Ma7Hi = Ea7Hi * ((H3 / 3) + H4)$
 $Ma8Hi = Ea8Hi * (H4 / 2)$
 $Ma9Hi = Ea9Hi * (H4 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1a))$
 $Ma2Vi = Ea2Vi * (B + C + (DM1 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM1))$
 $Ma4Vi = Ea4Vi * (B + C + (DM2 / 2))$
 $Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * DM2))$
 $Ma6Vi = Ea6Vi * (B + C + (DM3 / 2))$
 $Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * DM3))$

$Ma8Vi = Ea8Vi * (B + C + (D / 2))$
 $Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * D))$

'Beban Air'
 $Pairi = 0.5 * (Lw1 + L2 + L3 + L4) ^ 2 * Gw$
 $PairHi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Pairi$
 $PairVi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C4Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i$
 $C1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C4Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i$
 $Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4))$
 $Mc2Hi = C2Hi * ((H2 / 2) + (H3 + H4))$
 $Mc3Hi = C3Hi * ((H3 / 2) + H4)$
 $Mc4Hi = C4Hi * (H4 / 2)$
 $Mc1Vi = C1Vi * (B + C + (DM1 / 2))$
 $Mc2Vi = C2Vi * (B + C + (DM2 / 2))$
 $Mc3Vi = C3Vi * (B + C + (DM3 / 2))$
 $Mc4Vi = C4Vi * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi + Eq5Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi + Eq5Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi + Mq4Hi + Mq5Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi + Mq5Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi + Ea5Vi + Ea6Vi + Ea7Vi + Ea8Vi + Ea9Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi + Ea5Hi + Ea6Hi + Ea7Hi + Ea8Hi + Ea9Hi$

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JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +
Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi + Ma8Hi
+ Ma9Hi
JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi + Ma8Vi
+ Ma9Vi
JCHi = C1Hi + C2Hi + C3Hi + C4Hi
JCVi = C1Vi + C2Vi + C3Vi + C4Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +
Mc4Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +
Mc4Vi

EaVi = (JEqVi + JEaVi) - JCVi + PairVi
Eai = (JEqHi + JEaHi) - JCHi + PairHi
MaVi = (JMqVi + JMaVi) - JMCVi +
MairVi
Mai = (JMqHi + JMaHi) - JMCHi + MairHi

End Sub
Sub Ba3()
    'Gaya Eksternal'
    'Beban Merata Q'
    QQ = Q
    Do While QQ <> 0
        Eq1 = (Q * L1) * Ka1
        Eq2 = (Q + L1 * Gb1) * L2 * Ka2
        Eq3 = (Q + L1 * Gb1 + L2 * Ga2) * L3 *
        Ka3
        Eq4 = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
        Ga3) * L4 * Ka4
        Eq5 = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
        Ga3 + L4 * Ga4) * T2 * Ka4
        QQ = 0
        Loop
        Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
        22))) * Eq1
        Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
        22))) * Eq2
        Eq3H = (Cos((Delta3 + lamda) / (180 * 7 /
        22))) * Eq3
        Eq4H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Eq4
        Eq5H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Eq5
        Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
        22))) * Eq1
        Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
        22))) * Eq2
        Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
        22))) * Eq3
        Eq4V = (Sin((Delta4 + lamda) / (180 * 7 /
        22))) * Eq4
        Eq5V = (Sin((Delta4 + lamda) / (180 * 7 /
        22))) * Eq5
        Eq1H = Eq1H * ((H1 / 2) + (H2 + H3 +
        H4 + T2))
        Eq2H = Eq2H * ((H2 / 2) + (H3 + H4 +
        T2))
        Eq3H = Eq3H * ((H3 / 2) + (H4 + T2))
        Eq4H = Eq4H * ((H4 / 2) + T2)
        Eq5H = Eq5H * (T2 / 2)
        Eq1V = Eq1V * (A + B + C + (DM1 / 2))
        Eq2V = Eq2V * (A + B + C + (DM2 / 2))
        Eq3V = Eq3V * (A + B + C + (DM3 / 2))
        Eq4V = Eq4V * (A + B + C + (D / 2))
        Eq5V = Eq5V * (L)

'Beban Tanah'
Ea1 = 0.5 * L1 ^ 2 * Gb1 * Ka1
Ea2 = ((L1 * Gb1) * Ka2) * L2
Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
Ea4 = ((L1 * Gb1 + L2 * Ga2) * Ka3) * L3
Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
Ea6 = ((L1 * Gb1 + L2 * Ga2 + L3 * Ga3) *
        Ka4) * L4
        Ea7 = 0.5 * (L4) ^ 2 * Ga4 * Ka4
        Ea8 = ((L1 * Gb1 + L2 * Ga2 + L3 * Ga3 +
        L4 * Ga4) * Ka4) * T2
        Ea9 = 0.5 * (T2) ^ 2 * Ga4 * Ka4
        Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
        22))) * Ea1
        Ea2H = (Cos((Delta2 + lamda) / (180 * 7 /
        22))) * Ea2
        Ea3H = (Cos((Delta2 + lamda) / (180 * 7 /
        22))) * Ea3
        Ea4H = (Cos((Delta3 + lamda) / (180 * 7 /
        22))) * Ea4
        Ea5H = (Cos((Delta3 + lamda) / (180 * 7 /
        22))) * Ea5
        Ea6H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Ea6
        Ea7H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Ea7
        Ea8H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Ea8
        Ea9H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Ea9
        Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
        22))) * Ea1
        Ea2V = (Sin((Delta2 + lamda) / (180 * 7 /
        22))) * Ea2
        Ea3V = (Sin((Delta2 + lamda) / (180 * 7 /
        22))) * Ea3
        Ea4V = (Sin((Delta3 + lamda) / (180 * 7 /
        22))) * Ea4
        Ea5V = (Sin((Delta3 + lamda) / (180 * 7 /
        22))) * Ea5
        Ea6V = (Sin((Delta4 + lamda) / (180 * 7 /
        22)))

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$22))) * Ea6$
 $Ea7V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Ma3H = Ea3H * ((H2 / 3) + (H3 + H4 + T2))$
 $Ma4H = Ea4H * ((H3 / 2) + (H4 + T2))$
 $Ma5H = Ea5H * ((H3 / 3) + (H4 + T2))$
 $Ma6H = Ea6H * ((H4 / 2) + T2)$
 $Ma7H = Ea7H * ((H4 / 3) + T2)$
 $Ma8H = Ea8H * (T2 / 2)$
 $Ma9H = Ea9H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2))$
 $Ma4V = Ea4V * (A + B + C + (DM3 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM3))$
 $Ma6V = Ea6V * (A + B + C + (D / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * D))$
 $Ma8V = Ea8V * (L)$
 $Ma9V = Ea9V * (L)$

'Beban Air'

$Pair = 0.5 * (L2 + L3 + L4 + T2) ^ 2 * Gw$
 $PairH = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'

$C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = T2 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$

$C5H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $C1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + T2))$
 $Mc4H = C4H * ((H4 / 2) + T2)$
 $Mc5H = C5H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (D / 2))$
 $Mc5V = C5V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V$
 $JCH = C1H + C2H + C3H + C4H + C5H$
 $JCV = C1V + C2V + C3V + C4V + C5V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Internal'

$Beban Merata Q'$
 $QQ = Q$

```

Do While QQ < 0
Eq1i = (Q * L1) * Ka1
Eq2i = (Q + L1 * Gb1) * L2 * Ka2
Eq3i = (Q + L1 * Gb1 + L2 * Ga2) * L3 *
Ka3
Eq4i = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
Ga3) * L4 * Ka4
QQ = 0
Loop
Eq1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Eq2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Eq2i
Eq3Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Eq3i
Eq4Hi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Eq4i
Eq1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Eq2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Eq2i
Eq3Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Eq3i
Eq4Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq4i
Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 +
H4))
Mq2Hi = Eq2Hi * ((H2 / 2) + (H3 + H4))
Mq3Hi = Eq3Hi * ((H3 / 2) + H4)
Mq4Hi = Eq4Hi * (H4 / 2)
Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))
Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))
Mq3Vi = Eq3Vi * (B + C + (DM3 / 2))
Mq4Vi = Eq4Vi * (B + C + (D / 2))

'Beban Tanah'
Ea1i = 0.5 * L1 ^ 2 * Gb1 * Ka1
Ea2i = (L1 * Gb1) * Ka2 * L2
Ea3i = 0.5 * L2 ^ 2 * Ga2 * Ka2
Ea4i = (L1 * Gb1 + L2 * Ga2) * Ka3 * L3
Ea5i = 0.5 * L3 ^ 2 * Ga3 * Ka3
Ea6i = (L1 * Gb1 + L2 * Ga2 + L3 * Ga3) *
Ka4 * L4
Ea7i = 0.5 * L4 ^ 2 * Ga4 * Ka4
Ea1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1i
Ea2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea2i
Ea3Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea3i
Ea4Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea4i
Ea5Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea5i
Ea6Hi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea6i
Ea7Hi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea7i
Ea1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1i
Ea2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea2i
Ea3Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea3i
Ea4Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea4i
Ea5Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea5i
Ea6Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Ea6i
Ea7Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Ea7i
Ma1Hi = Ea1Hi * ((H1 / 2) + (H2 + H3 +
H4))
Ma2Hi = Ea2Hi * ((H2 / 2) + (H3 + H4))
Ma3Hi = Ea3Hi * ((H2 / 3) + (H3 + H4))
Ma4Hi = Ea4Hi * ((H3 / 2) + H4)
Ma5Hi = Ea5Hi * ((H3 / 3) + H4)
Ma6Hi = Ea6Hi * (H4 / 2)
Ma7Hi = Ea7Hi * (H4 / 3)
Ma1Vi = Ea1Vi * (B + C + ((1 / 3) *
DM1))
Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))
Ma3Vi = Ea3Vi * (B + C + ((1 / 3) *
DM2))
Ma4Vi = Ea4Vi * (B + C + (DM3 / 2))
Ma5Vi = Ea5Vi * (B + C + ((1 / 3) *
DM3))
Ma6Vi = Ea6Vi * (B + C + (D / 2))
Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * D))

'Beban Air'
Pairi = 0.5 * (L2 + L3 + L4) ^ 2 * Gw
PairHi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Pairi
PairVi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Pairi
MairHi = PairHi * (Hwt / 3)
MairVi = PairVi * (B + C + ((1 / 3) * D))

'Cohesi'
C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)
C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)
C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)
C1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * C2i
C3Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * C3i

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$$\begin{aligned}
& 22))) * C3i \\
& \quad C4Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i \\
& \quad \quad C1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i \\
& \quad \quad \quad C2Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i \\
& \quad \quad \quad \quad C3Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i \\
& \quad \quad \quad \quad \quad C4Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i \\
& \quad \quad \quad \quad \quad \quad Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4)) \\
& \quad \quad \quad \quad \quad \quad Mc2Hi = C2Hi * ((H2 / 2) + (H3 + H4)) \\
& \quad \quad \quad \quad \quad \quad Mc3Hi = C3Hi * ((H3 / 2) + H4) \\
& \quad \quad \quad \quad \quad \quad Mc4Hi = C4Hi * (H4 / 2) \\
& \quad \quad \quad \quad \quad \quad Mc1Vi = C1Vi * (B + C + (DM1 / 2)) \\
& \quad \quad \quad \quad \quad \quad Mc2Vi = C2Vi * (B + C + (DM2 / 2)) \\
& \quad \quad \quad \quad \quad \quad Mc3Vi = C3Vi * (B + C + (DM3 / 2)) \\
& \quad \quad \quad \quad \quad \quad Mc4Vi = C4Vi * (B + C + (D / 2)) \\
& \quad \quad \quad \quad \quad \quad JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi \\
& \quad \quad \quad \quad \quad \quad JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi \\
& \quad \quad \quad \quad \quad \quad JMqHi = Mq1Hi + Mq2Hi + Mq3Hi + Mq4Hi \\
& \quad \quad \quad \quad \quad \quad JMqVi = Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi \\
& \quad \quad \quad \quad \quad \quad JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi + Ea5Vi + Ea6Vi + Ea7Vi \\
& \quad \quad \quad \quad \quad \quad JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi + Ea5Hi + Ea6Hi + Ea7Hi \\
& \quad \quad \quad \quad \quad \quad JMaHi = Ma1Hi + Ma2Hi + Ma3Hi + Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi \\
& \quad \quad \quad \quad \quad \quad JMaVi = Ma1Vi + Ma2Vi + Ma3Vi + Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi \\
& \quad \quad \quad \quad \quad \quad JCHi = C1Hi + C2Hi + C3Hi + C4Hi \\
& \quad \quad \quad \quad \quad \quad JCVi = C1Vi + C2Vi + C3Vi + C4Vi \\
& \quad \quad \quad \quad \quad \quad JMCHi = Mc1Hi + Mc2Hi + Mc3Hi + Mc4Hi \\
& \quad \quad \quad \quad \quad \quad JMCVi = Mc1Vi + Mc2Vi + Mc3Vi + Mc4Vi \\
& \quad \quad \quad \quad \quad \quad EaVi = (JEqVi + JEaVi) - JCVi + PairVi \\
& \quad \quad \quad \quad \quad \quad Eai = (JEqHi + JEaHi) - JCHi + PairHi \\
& \quad \quad \quad \quad \quad \quad MaVi = (JMqVi + JMaVi) - JMCVi + MairVi \\
& \quad \quad \quad \quad \quad \quad Mai = (JMqHi + JMaHi) - JMCHi + MairHi \\
& \quad End Sub
\end{aligned}$$

Sub Ba4()
'Gaya Eksternal'
'Beban Merata Q'
QQ = Q
Do While QQ < 0
Eq1 = (Q * L1) * Kal
Eq2 = (Q + L1 * Gb1) * (L2 - Lw2) * Ka2
Eq3 = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2)
* Lw2 * Ka2
Eq4 = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2 + Lw2 * Ga2) * L3 * Ka3
Eq5 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2 + L3 * Ga3) * L4 * Ka4
Eq6 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * T2 * Ka4
QQ = 0
Loop
Eq1H = ($\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1$
Eq2H = ($\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2$
Eq3H = ($\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3$
Eq4H = ($\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq4$
Eq5H = ($\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * Eq5$
Eq6H = ($\cos((\Delta6 + \lambda) / (180 * 7 / 22))) * Eq6$
Eq1V = ($\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1$
Eq2V = ($\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2$
Eq3V = ($\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3$
Eq4V = ($\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq4$
Eq5V = ($\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Eq5$
Eq6V = ($\sin((\Delta6 + \lambda) / (180 * 7 / 22))) * Eq6$
Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 + H4 + T2))
Mq2H = Eq2H * (((H2 - Hw2) / 2) + (Hw2 + H3 + H4 + T2))
Mq3H = Eq3H * ((Hw2 / 2) + (H3 + H4 + T2))
Mq4H = Eq4H * ((H3 / 2) + (H4 + T2))
Mq5H = Eq5H * ((H4 / 2) + T2)
Mq6H = Eq6H * (T2 / 2)
Mq1V = Eq1V * (A + B + C + (DM1 / 2))
Mq2V = Eq2V * (A + B + C + (DM2a / 2))
Mq3V = Eq3V * (A + B + C + (DM2 / 2))
Mq4V = Eq4V * (A + B + C + (DM3 / 2))

$Mq5V = Eq5V * (A + B + C + (D / 2))$
 $Mq6V = Eq6V * (L)$

'Beban Tanah'

$Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Ka1$
 $Ea2 = ((L1 * Gb1) * Ka2) * (L2 - Lw2)$
 $Ea3 = 0.5 * (L2 - Lw2) ^ 2 * Gb2 * Ka2$
 $Ea4 = ((L1 * Gb1 + (L2 - Lw2) * Gb2) * Ka2) * Lw2$
 $Ea5 = 0.5 * (Lw2) ^ 2 * Ga2 * Ka2$
 $Ea6 = ((L1 * Gb1 + ((L2 - Lw2) * Gb2) + Lw2 * Ga2) * Ka3) * L3$
 $Ea7 = 0.5 * (L3) ^ 2 * Ga3 * Ka3$
 $Ea8 = ((L1 * Gb1 + ((L2 - Lw2) * Gb2) + Lw2 * Ga2 + L3 * Ga3) * Ka4) * L4$
 $Ea9 = 0.5 * (L4) ^ 2 * Ga4 * Ka4$
 $Ea10 = ((L1 * Gb1 + ((L2 - Lw2) * Gb2) + Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka4) * T2$
 $Ea11 = 0.5 * (T2) ^ 2 * Ga4 * Ka4$
 $Ea1H = (\text{Cos}((\Delta 1 + \text{lamda}) / (180 * 7 / 22))) * Ea1$
 $Ea2H = (\text{Cos}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (\text{Cos}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\text{Cos}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\text{Cos}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea5$
 $Ea6H = (\text{Cos}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * Ea6$
 $Ea7H = (\text{Cos}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * Ea7$
 $Ea8H = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea8$
 $Ea9H = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea9$
 $Ea10H = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea10$
 $Ea11H = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea11$
 $Ea1V = (\text{Sin}((\Delta 1 + \text{lamda}) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * Ea7$

$22))) * Ea7$
 $Ea8V = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea9$
 $Ea10V = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea10$
 $Ea11V = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Ea11$

$Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + T2))$
 $Ma2H = Ea2H * (((H2 - Hw2) / 2) + (Hw2 + H3 + H4 + T2))$
 $Ma3H = Ea3H * (((H2 - Hw2) / 3) + (Hw2 + H3 + H4 + T2))$
 $Ma4H = Ea4H * ((Hw2 / 2) + (H3 + H4 + T2))$
 $Ma5H = Ea5H * ((Hw2 / 3) + (H3 + H4 + T2))$
 $Ma6H = Ea6H * ((H3 / 2) + (H4 + T2))$
 $Ma7H = Ea7H * ((H3 / 3) + (H4 + T2))$
 $Ma8H = Ea8H * ((H4 / 2) + T2)$
 $Ma9H = Ea9H * ((H4 / 3) + T2)$
 $Ma10H = Ea10H * (T2 / 2)$
 $Ma11H = Ea11H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2a / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2a))$
 $Ma4V = Ea4V * (A + B + C + (DM2 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM2))$
 $Ma6V = Ea6V * (A + B + C + (DM3 / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * DM3))$
 $Ma8V = Ea8V * (A + B + C + (D / 2))$
 $Ma9V = Ea9V * (A + B + C + ((1 / 3) * D))$
 $Ma10V = Ea10V * (L)$
 $Ma11V = Ea11V * (L)$

'Beban Air'

$Pair = 0.5 * ((L2 - Lw2) + L3 + L4 + T2) ^ 2 * Gw$
 $PairH = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Pair$
 $PairV = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'

$C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$

$C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = T2 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $C1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C5$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + T2))$
 $Mc4H = C4H * ((H4 / 2) + T2)$
 $Mc5H = C5H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (D / 2))$
 $Mc5V = C5V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V$
 $JCH = C1H + C2H + C3H + C4H + C5H$
 $JCV = C1V + C2V + C3V + C4V + C5V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V$
 $EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

 $'Gaya Internal'$
 $'Beban Merata Q'$
 $QQ = Q$
 $Do While QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Gb1) * (L2 - Lw2) * Ka1$
 $Eq3i = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2) * Lw2 * Ka2$
 $Eq4i = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2 + Lw2 * Ga2) * L3 * Ka3$
 $Eq5i = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2 + Lw2 * Ga2 + L3 * Ga3) * L4 * Ka4$
 $QQ = 0$
 $Loop$
 $Eq1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Eq1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 + H4))$
 $Mq2Hi = Eq2Hi * (((H2 - Hw2) / 2) + (Hw2 + H3 + H4))$
 $Mq3Hi = Eq3Hi * (((Hw2 / 2) + (H3 + H4))$
 $Mq4Hi = Eq4Hi * ((H3 / 2) + H4)$
 $Mq5Hi = Eq5Hi * (H4 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM2a / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (DM2 / 2))$
 $Mq4Vi = Eq4Vi * (B + C + (DM3 / 2))$

$$Mq5Vi = Eq5Vi * (B + C + (D / 2))$$

'Beban Tanah'

$$\begin{aligned} Eali &= 0.5 * L1 ^ 2 * Gb1 * Ka1 \\ Ea2i &= (L1 * Gb1) * Ka2 * (L2 - Lw2) \\ Ea3i &= 0.5 * (L2 - Lw2) ^ 2 * Gb2 * Ka2 \\ Ea4i &= (L1 * Gb1 + (L2 - Lw2) * Gb2) * \\ &\quad Ka2 * Lw2 \\ Ea5i &= 0.5 * (Lw2) ^ 2 * Ga2 * Ka2 \\ Ea6i &= (L1 * Gb1 + (L2 - Lw2) * Gb2 + \\ &\quad Lw2 * Ga2) * Ka3 * L3 \\ Ea7i &= 0.5 * (L3) ^ 2 * Ga3 * Ka3 \\ Ea8i &= (L1 * Gb1 + (L2 - Lw2) * Gb2 + \\ &\quad Lw2 * Ga2 + L3 * Ga3) * Ka4 * L4 \\ Ea9i &= 0.5 * (L4) ^ 2 * Ga4 * Ka4 \\ Ea1Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea1i \\ Ea2Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea2i \\ Ea3Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea3i \\ Ea4Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea4i \\ Ea5Hi &= (\cos((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea5i \\ Ea6Hi &= (\cos((\Delta3 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea6i \\ Ea7Hi &= (\cos((\Delta3 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea7i \\ Ea8Hi &= (\cos((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea8i \\ Ea9Hi &= (\cos((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea9i \\ Ea1Vi &= (\sin((\Delta1 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea1i \\ Ea2Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea2i \\ Ea3Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea3i \\ Ea4Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea4i \\ Ea5Vi &= (\sin((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea5i \\ Ea6Vi &= (\sin((\Delta3 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea6i \\ Ea7Vi &= (\sin((\Delta3 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea7i \\ Ea8Vi &= (\sin((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea8i \\ Ea9Vi &= (\sin((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * Ea9i \\ Ma1Hi &= Ea1Hi * ((H1 / 3) + (H2 + H3 + \\ &\quad H4)) \\ Ma2Hi &= Ea2Hi * (((H2 - Hw2) / 2) + (Hw2 \\ &\quad + H3 + H4)) \end{aligned}$$

$$\begin{aligned} Ma3Hi &= Ea3Hi * ((H2 - Hw2) / 3) + \\ &\quad (Hw2 + H3 + H4)) \end{aligned}$$

$$Ma4Hi = Ea4Hi * ((Hw2 / 2) + (H3 + H4))$$

$$Ma5Hi = Ea5Hi * ((Hw2 / 3) + (H3 + H4))$$

$$Ma6Hi = Ea6Hi * ((H3 / 2) + H4)$$

$$Ma7Hi = Ea7Hi * ((H3 / 3) + H4)$$

$$Ma8Hi = Ea8Hi * (H4 / 2)$$

$$Ma9Hi = Ea9Hi * (H4 / 3)$$

$$Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * \\ DM1))$$

$$Ma2Vi = Ea2Vi * (B + C + (DM2a / 2))$$

$$Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * \\ DM2a))$$

$$Ma4Vi = Ea4Vi * (B + C + (DM2 / 2))$$

$$Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * \\ DM2))$$

$$Ma6Vi = Ea6Vi * (B + C + (DM3 / 2))$$

$$Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * \\ DM3))$$

$$Ma8Vi = Ea8Vi * (B + C + (D / 2))$$

$$Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * D))$$

'Beban Air'

$$Pairi = 0.5 * (Lw2 + L3 + L4) ^ 2 * Gw$$

$$\begin{aligned} PairHi &= (\cos((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * Pairi \end{aligned}$$

$$\begin{aligned} PairVi &= (\sin((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * Pairi \end{aligned}$$

$$MairHi = PairHi * (Hwt / 3)$$

$$MairVi = PairVi * (B + C + ((1 / 3) * D))$$

'Cohesi'

$$C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$$

$$C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$$

$$C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$$

$$C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$$

$$\begin{aligned} C1Hi &= (\cos((\Delta1 + \lambda) / (180 * 7 / \\ &\quad 22))) * C1i \end{aligned}$$

$$C2Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * C2i$$

$$C3Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / \\ &\quad 22))) * C3i$$

$$C4Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * C4i$$

$$C1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / \\ &\quad 22))) * C1i$$

$$C2Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / \\ &\quad 22))) * C2i$$

$$C3Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / \\ &\quad 22))) * C3i$$

$$C4Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / \\ &\quad 22))) * C4i$$

$$Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + \\ H4))$$

$$Mc2Hi = C2Hi * ((H2 / 2) + (H3 + H4))$$

$Mc3Hi = C3Hi * ((H3 / 2) + H4)$
 $Mc4Hi = C4Hi * (H4 / 2)$
 $Mc1Vi = C1Vi * (B + C + (DM1 / 2))$
 $Mc2Vi = C2Vi * (B + C + (DM2 / 2))$
 $Mc3Vi = C3Vi * (B + C + (DM3 / 2))$
 $Mc4Vi = C4Vi * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi$
 $+ Eq5Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi$
 $+ Eq5Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi +$
 $Mq4Hi + Mq5Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi +$
 $Mq4Vi + Mq5Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi +$
 $Ea5Vi + Ea6Vi + Ea7Vi + Ea8Vi + Ea9Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi +$
 $Ea5Hi + Ea6Hi + Ea7Hi + Ea8Hi + Ea9Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +$
 $Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi + Ma8Hi$
 $+ Ma9Hi$
 $JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +$
 $Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi + Ma8Vi$
 $+ Ma9Vi$
 $JCHi = C1Hi + C2Hi + C3Hi + C4Hi$
 $JCVi = C1Vi + C2Vi + C3Vi + C4Vi$
 $JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +$
 $Mc4Hi$
 $JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +$
 $Mc4Vi$

 $EaVi = (JEqVi + JEaVi) - JCVi + PairVi$
 $Eai = (JEqHi + JEaHi) - JCHi + PairHi$
 $MaVi = (JMqVi + JMaVi) - JMCHi +$
 $MairVi$
 $Mai = (JMqHi + JMaHi) - JMCHi + MairHi$

 End Sub
 Sub Ba5()
 'Gaya Eksternal'
 'Beban Merata Q'
 QQ = Q
 Do While QQ <> 0
 Eq1 = (Q * L1) * Ka1
 Eq2 = (Q + L1 * Gb1) * L2 * Ka2
 Eq3 = (Q + L1 * Gb1 + L2 * Gb2) * L3 *
 Ka3
 Eq4 = (Q + L1 * Gb1 + L2 * Gb2 + L3 *
 Ga3) * L4 * Ka4
 Eq5 = (Q + L1 * Gb1 + L2 * Gb2 + L3 *
 Ga3 + L4 * Ga4) * T2 * Ka4
 QQ = 0
 Loop
 Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1
 Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
 22))) * Eq2
 Eq3H = (Cos((Delta3 + lamda) / (180 * 7 /
 22))) * Eq3
 Eq4H = (Cos((Delta4 + lamda) / (180 * 7 /
 22))) * Eq4
 Eq5H = (Cos((Delta4 + lamda) / (180 * 7 /
 22))) * Eq5
 Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1
 Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
 22))) * Eq2
 Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
 22))) * Eq3
 Eq4V = (Sin((Delta4 + lamda) / (180 * 7 /
 22))) * Eq4
 Eq5V = (Sin((Delta4 + lamda) / (180 * 7 /
 22))) * Eq5
 Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 +
 H4 + T2))
 Mq2H = Eq2H * ((H2 / 2) + (H3 + H4 +
 T2))
 Mq3H = Eq3H * ((H3 / 2) + (H4 + T2))
 Mq4H = Eq4H * ((H4 / 2) + T2)
 Mq5H = Eq5H * (T2 / 2)
 Mq1V = Eq1V * (A + B + C + (DM1 / 2))
 Mq2V = Eq2V * (A + B + C + (DM2 / 2))
 Mq3V = Eq3V * (A + B + C + (DM3 / 2))
 Mq4V = Eq4V * (A + B + C + (D / 2))
 Mq5V = Eq5V * (L)

Beban Tanah'
 $Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Ka1$
 $Ea2 = ((L1 * Gb1) * Ka2) * L2$
 $Ea3 = 0.5 * (L2) ^ 2 * Gb2 * Ka2$
 $Ea4 = ((L1 * Gb1 + L2 * Gb2) * Ka3) * L3$
 $Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3$
 $Ea6 = ((L1 * Gb1 + L2 * Gb2 + L3 * Ga3) * Ka4) * L4$
 $Ea7 = 0.5 * (L4) ^ 2 * Ga4 * Ka4$
 $Ea8 = ((L1 * Gb1 + L2 * Gb2 + L3 * Ga3 + L4 * Ga4) * Ka4) * T2$
 $Ea9 = 0.5 * (T2) ^ 2 * Ga4 * Ka4$
 $Ea1H = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Ea1$
 $Ea2H = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Ea5$
 $Ea6H = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea6$

$22))) * Ea6$
 $Ea7H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Ma3H = Ea3H * ((H2 / 3) + (H3 + H4 + T2))$
 $Ma4H = Ea4H * ((H3 / 2) + (H4 + T2))$
 $Ma5H = Ea5H * ((H3 / 3) + (H4 + T2))$
 $Ma6H = Ea6H * ((H4 / 2) + T2)$
 $Ma7H = Ea7H * ((H4 / 3) + T2)$
 $Ma8H = Ea8H * (T2 / 2)$
 $Ma9H = Ea9H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2))$
 $Ma4V = Ea4V * (A + B + C + (DM3 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM3))$
 $Ma6V = Ea6V * (A + B + C + (D / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * D))$
 $Ma8V = Ea8V * (L)$
 $Ma9V = Ea9V * (L)$

'Beban Air'
 $\text{Pair} = 0.5 * (L3 + L4 + T2) ^ 2 * Gw$
 $\text{PairH} = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{PairV} = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * \text{Pair}$

$22))) * \text{Pair}$
 $MairH = \text{PairH} * (Hwt / 3)$
 $MairV = \text{PairV} * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = T2 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * C5$
 $C1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * C5$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + T2))$
 $Mc4H = C4H * ((H4 / 2) + T2)$
 $Mc5H = C5H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (D / 2))$
 $Mc5V = C5V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H$

$+ \text{Ma5H} + \text{Ma6H} + \text{Ma7H} + \text{Ma8H} + \text{Ma9H}$
 $\text{JMaV} = \text{Ma1V} + \text{Ma2V} + \text{Ma3V} + \text{Ma4V} +$
 $\text{Ma5V} + \text{Ma6V} + \text{Ma7V} + \text{Ma8V} + \text{Ma9V}$
 $\text{JCH} = \text{C1H} + \text{C2H} + \text{C3H} + \text{C4H} + \text{C5H}$
 $\text{JCV} = \text{C1V} + \text{C2V} + \text{C3V} + \text{C4V} + \text{C5V}$
 $\text{JMCH} = \text{Mc1H} + \text{Mc2H} + \text{Mc3H} + \text{Mc4H}$
 $+ \text{Mc5H}$
 $\text{JMCV} = \text{Mc1V} + \text{Mc2V} + \text{Mc3V} + \text{Mc4V}$
 $+ \text{Mc5V}$
 $\text{EaV} = (\text{JEqV} + \text{JEaV}) - \text{JCV} + \text{PairV}$
 $\text{Ea} = (\text{JEqH} + \text{JEaH}) - \text{JCH} + \text{PairH}$
 $\text{MaV} = (\text{JMqV} + \text{JMaV}) - \text{JMCV} + \text{MairV}$
 $\text{Ma} = (\text{JMqH} + \text{JMaH}) - \text{JMCH} + \text{MairH}$

'Gaya Internal'
'Beban Merata Q'
 $\text{QQ} = \text{Q}$
 $\text{Do While } \text{QQ} \lhd 0$
 $\text{Eq1i} = (\text{Q} * \text{L1}) * \text{Ka1}$
 $\text{Eq2i} = (\text{Q} + \text{L1} * \text{Gb1}) * \text{L2} * \text{Ka2}$
 $\text{Eq3i} = (\text{Q} + \text{L1} * \text{Gb1} + \text{L2} * \text{Gb2}) * \text{L3} * \text{Ka3}$
 $\text{Eq4i} = (\text{Q} + \text{L1} * \text{Gb1} + \text{L2} * \text{Gb2} + \text{L3} * \text{Ga3}) * \text{L4} * \text{Ka4}$
 $\text{QQ} = 0$
Loop
 $\text{Eq1Hi} = (\text{Cos}((\Delta 1 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq1i}$
 $\text{Eq2Hi} = (\text{Cos}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq2i}$
 $\text{Eq3Hi} = (\text{Cos}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq3i}$
 $\text{Eq4Hi} = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq4i}$
 $\text{Eq1Vi} = (\text{Sin}((\Delta 1 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq1i}$
 $\text{Eq2Vi} = (\text{Sin}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq2i}$
 $\text{Eq3Vi} = (\text{Sin}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq3i}$
 $\text{Eq4Vi} = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq4i}$
 $\text{Mq1Hi} = \text{Eq1Hi} * ((\text{H1} / 3) + (\text{H2} + \text{H3} + \text{H4}))$
 $\text{Mq2Hi} = \text{Eq2Hi} * ((\text{H2} / 2) + (\text{H3} + \text{H4}))$
 $\text{Mq3Hi} = \text{Eq3Hi} * ((\text{H3} / 2) + \text{H4})$
 $\text{Mq4Hi} = \text{Eq4Hi} * (\text{H4} / 2)$
 $\text{Mq1Vi} = \text{Eq1Vi} * (\text{B} + \text{C} + (\text{DM1} / 2))$
 $\text{Mq2Vi} = \text{Eq2Vi} * (\text{B} + \text{C} + (\text{DM2} / 2))$
 $\text{Mq3Vi} = \text{Eq3Vi} * (\text{B} + \text{C} + (\text{DM3} / 2))$
 $\text{Mq4Vi} = \text{Eq4Vi} * (\text{B} + \text{C} + (\text{D} / 2))$

'Beban Tanah'
 $\text{Eali} = 0.5 * \text{L1} ^ 2 * \text{Gb1} * \text{Ka1}$

 $\text{Ea2i} = (\text{L1} * \text{Gb1}) * \text{Ka2} * \text{L2}$
 $\text{Ea3i} = 0.5 * \text{L2} ^ 2 * \text{Gb2} * \text{Ka2}$
 $\text{Ea4i} = (\text{L1} * \text{Gb1} + \text{L2} * \text{Gb2}) * \text{Ka3} * \text{L3}$
 $\text{Ea5i} = 0.5 * \text{L3} ^ 2 * \text{Ga3} * \text{Ka3}$
 $\text{Ea6i} = (\text{L1} * \text{Gb1} + \text{L2} * \text{Gb2} + \text{L3} * \text{Ga3}) * \text{Ka4} * \text{L4}$
 $\text{Ea7i} = 0.5 * \text{L4} ^ 2 * \text{Ga4} * \text{Ka4}$
 $\text{Ea1Hi} = (\text{Cos}((\Delta 1 + \text{lamda}) / (180 * 7 / 22))) * \text{Eali}$
 $\text{Ea2Hi} = (\text{Cos}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea2i}$
 $\text{Ea3Hi} = (\text{Cos}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea3i}$
 $\text{Ea4Hi} = (\text{Cos}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea4i}$
 $\text{Ea5Hi} = (\text{Cos}((\Delta 5 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea5i}$
 $\text{Ea6Hi} = (\text{Cos}((\Delta 6 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea6i}$
 $\text{Ea7Hi} = (\text{Cos}((\Delta 7 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea7i}$
 $\text{Ea1Vi} = (\text{Sin}((\Delta 1 + \text{lamda}) / (180 * 7 / 22))) * \text{Eali}$
 $\text{Ea2Vi} = (\text{Sin}((\Delta 2 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea2i}$
 $\text{Ea3Vi} = (\text{Sin}((\Delta 3 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea3i}$
 $\text{Ea4Vi} = (\text{Sin}((\Delta 4 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea4i}$
 $\text{Ea5Vi} = (\text{Sin}((\Delta 5 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea5i}$
 $\text{Ea6Vi} = (\text{Sin}((\Delta 6 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea6i}$
 $\text{Ea7Vi} = (\text{Sin}((\Delta 7 + \text{lamda}) / (180 * 7 / 22))) * \text{Ea7i}$
 $\text{Ma1Hi} = \text{Ea1Hi} * ((\text{H1} / 3) + (\text{H2} + \text{H3} + \text{H4}))$
 $\text{Ma2Hi} = \text{Ea2Hi} * ((\text{H2} / 2) + (\text{H3} + \text{H4}))$
 $\text{Ma3Hi} = \text{Ea3Hi} * ((\text{H2} / 3) + (\text{H3} + \text{H4}))$
 $\text{Ma4Hi} = \text{Ea4Hi} * ((\text{H3} / 2) + \text{H4})$
 $\text{Ma5Hi} = \text{Ea5Hi} * ((\text{H3} / 3) + \text{H4})$
 $\text{Ma6Hi} = \text{Ea6Hi} * (\text{H4} / 2)$
 $\text{Ma7Hi} = \text{Ea7Hi} * (\text{H4} / 3)$
 $\text{Ma1Vi} = \text{Ea1Vi} * (\text{B} + \text{C} + ((1 / 3) * \text{DM1}))$
 $\text{Ma2Vi} = \text{Ea2Vi} * (\text{B} + \text{C} + (\text{DM2} / 2))$
 $\text{Ma3Vi} = \text{Ea3Vi} * (\text{B} + \text{C} + ((1 / 3) * \text{DM2}))$
 $\text{Ma4Vi} = \text{Ea4Vi} * (\text{B} + \text{C} + (\text{DM3} / 2))$
 $\text{Ma5Vi} = \text{Ea5Vi} * (\text{B} + \text{C} + ((1 / 3) * \text{DM3}))$
 $\text{Ma6Vi} = \text{Ea6Vi} * (\text{B} + \text{C} + (\text{D} / 2))$
 $\text{Ma7Vi} = \text{Ea7Vi} * (\text{B} + \text{C} + ((1 / 3) * \text{D}))$

'Beban Air'

```

JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi
JCHi = C1Hi + C2Hi + C3Hi + C4Hi
JCVi = C1Vi + C2Vi + C3Vi + C4Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +
Mc4Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +
Mc4Vi

EaVi = (JEqVi + JEaVi) - JCVi
Eai = (JEqHi + JEaHi) - JCHi
MaVi = (JMqVi + JMaVi) - JMCVi
Mai = (JMqHi + JMaHi) - JMCHi

End Sub
Sub Basah()
On Error Resume Next
Hw1 = H1 - (Ht - Hwt)
Hw2 = H2 - (Ht - Hwt - H1)
Hw3 = H3 - (Ht - Hwt - H1 - H2)
Hw4 = H4 - (Ht - Hwt - H1 - H2 - H3)
DM1a = ((Hw1 * D) / T1)
DM2a = ((Hw2 * D) / T1)
DM3a = ((Hw3 * D) / T1)
da = ((Hw4 * D) / T1)
Lw1 = ((Hw1) / (Abs(Cos(lamda * (180 * 7
/ 22))))) )
Lw2 = ((Hw2) / (Abs(Cos(lamda * (180 * 7
/ 22))))) )
Lw3 = ((Hw3) / (Abs(Cos(lamda * (180 * 7
/ 22))))) )
Lw4 = ((Hw4) / (Abs(Cos(lamda * (180 * 7
/ 22))))) )

'Tekanan Pasif
Epp = 0.5 * (T2) ^ 2 * Ga4 * Kp
Cp = T2 * 2 * Ch4 * ((Kp) ^ 0.5)
Ppair = 0.5 * (T2) ^ 2 * Gw
Mep = Ep * (T2 / 3)
Mcp = Cp * (T2 / 2)
Mpair = Ppair * (T2 / 3)
Mpp = Mep + Mcp + Mair
Ep = Epp + Cp + Ppair

If Hwt = Ht Then Ba1
If Hwt < Ht And (H2 + H3 + H4 + T2) <
Hwt Then Ba2
If Hwt = (H2 + H3 + H4 + T2) And Ht >
Hwt Then Ba3
If Hwt < (H2 + H3 + H4 + T2) And (H3 +
H4 + T2) < Hwt Then Ba4
If Hwt = (H3 + H4 + T2) And (H2 + H3 +
H4 + T2) > Hwt Then Ba5
If Hwt < (H3 + H4 + T2) And (H4 + T2) <
Hwt Then Ba6

If Hwt = (H4 + T2) And (H3 + H4 + T2) >
Hwt Then Ba7
If Hwt < (H4 + T2) And T2 < Hwt Then
Ba8
If Hwt = T2 And (H3 + T2) > Hwt Then
Ba9
If Hwt < T2 And (H3 + T2) > Hwt Then
Ba10
End Sub
Sub Gammatnh()
On Error Resume Next
Do While xx <> 0
MDIForm1.StatusBar1.Panels("koko").Text =
"Data berat volume tanah"
H1 = Text3.Text
H2 = Text7.Text
H3 = Text11.Text
H4 = Text15.Text
If Option1.Value = True Then GoTo
BBasah
If Option2.Value = True Then GoTo
KKering
BBasah:
If Ht = Hwt Then
pesan1 = "Berat Volume Tanah
Terendam Lapis 1="
pesan2 = "Berat Volume Tanah
Terendam Lapis 2="
pesan3 = "Berat Volume Tanah
Terendam Lapis 3="
pesan4 = "Berat Volume Tanah
Terendam Lapis 4="
Ga1 = InputBox(pesan1, "Gamma
Aksen")
Ga2 = InputBox(pesan2, "Gamma
Aksen")
Ga3 = InputBox(pesan3, "Gamma
Aksen")
Ga4 = InputBox(pesan4, "Gamma
Aksen")
ElseIf Hwt > (H2 + H3 + H4) And Ht >
Hwt Then
pesan1 = "Berat Volume Tanah Basah
Lapis 1="
pesan2 = "Berat Volume Tanah
Terendam Lapis 1="
pesan3 = "Berat Volume Tanah
Terendam Lapis 2="
pesan4 = "Berat Volume Tanah
Terendam Lapis 3="
pesan5 = "Berat Volume Tanah
Terendam Lapis 4="
Gb1 = InputBox(pesan1, "Gamma
Basah")
Ga1 = InputBox(pesan2, "Gamma

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Aksen")
    Ga2 = InputBox(pesan3, "Gamma
Aksen")
    Ga3 = InputBox(pesan4, "Gamma
Aksen")
    Ga4 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt = (H2 + H3 + H4) And Ht >
Hwt Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah
Terendam Lapis 2="
    pesan3 = "Berat Volume Tanah
Terendam Lapis 3="
    pesan4 = "Berat Volume Tanah
Terendam Lapis 4="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Ga2 = InputBox(pesan2, "Gamma
Aksen")
    Ga3 = InputBox(pesan3, "Gamma
Aksen")
    Ga4 = InputBox(pesan4, "Gamma
Aksen")
ElseIf Hwt < (H3 + H4) And Ht > Hwt
Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah
Terendam Lapis 2="
    pesan4 = "Berat Volume Tanah
Terendam Lapis 3="
    pesan5 = "Berat Volume Tanah
Terendam Lapis 4="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Ga2 = InputBox(pesan3, "Gamma
Aksen")
    Ga3 = InputBox(pesan4, "Gamma
Aksen")
    Ga4 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt = (H3 + H4) Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah
Terendam Lapis 3="
    pesan4 = "Berat Volume Tanah
Terendam Lapis 4="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")
    Ga3 = InputBox(pesan4, "Gamma
Aksen")
    Ga4 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt > (H4) And (H3 + H4) > Hwt
Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="
    pesan4 = "Berat Volume Tanah
Terendam Lapis 3="
    pesan5 = "Berat Volume Tanah
Terendam Lapis 4="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")
    Ga3 = InputBox(pesan4, "Gamma
Aksen")
    Ga4 = InputBox(pesan5, "Gamma
Aksen")
ElseIf (H4) = Hwt And Hwt < (H3 + H4)
Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="
    pesan4 = "Berat Volume Tanah
Terendam Lapis 4="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")
    Ga4 = InputBox(pesan4, "Gamma
Aksen")
ElseIf Hwt < (H4) Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="

```

```

Lapis 3="                                Sub Parameter()
pesan4 = "Berat Volume Tanah Basah    On Error Resume Next
Lapis 4="                                Q = Q.Text
pesan5 = "Berat Volume Tanah             T1 = T1.Text
Terendam Lapis 4="                         gpas = gpas.Text
Gb1 = InputBox(pesan1, "Gamma           Phi1 = Text1.Text
Basah")                                    Ch1 = Text2.Text
Gb2 = InputBox(pesan2, "Gamma           H1 = Text3.Text
Basah")                                    Delta1 = Text4.Text
Gb3 = InputBox(pesan3, "Gamma           Phi2 = Text5.Text
Basah")                                    Ch2 = Text6.Text
Gb4 = InputBox(pesan4, "Gamma           H2 = Text7.Text
Basah")                                    Delta2 = Text8.Text
Ga4 = InputBox(pesan5, "Gamma           Phi3 = Text9.Text
Aksen")                                   Ch3 = Text10.Text
                                         H3 = Text11.Text
                                         Delta3 = Text12.Text
                                         Phi4 = Text13.Text
                                         Ch4 = Text14.Text
                                         H4 = Text15.Text
                                         Delta4 = Text16.Text
                                         Hwt = Hwt.Text
                                         alfa = (Atn(T1 / D)) * (180 * (7 / 22))
                                         lamda = (180 - (90 + alfa))
                                         L = (A + B + C + D + E)
                                         Lt = ((T1 ^ 2) + (D ^ 2)) ^ (0.5)
                                         Ht = T1 + T2
                                         L1 = (H1 / (Cos(lamda / (180 * 7 / 22))))
                                         L2 = (H2 / (Cos(lamda / (180 * 7 / 22))))
                                         L3 = (H3 / (Cos(lamda / (180 * 7 / 22))))
                                         L4 = (H4 / (Cos(lamda / (180 * 7 / 22))))
                                         DM1 = ((H1 * D) / T1)
                                         DM2 = (H2 * D) / T1
                                         DM3 = (H3 * D) / T1
                                         Ka1 = ((Sin((alfa + Phi1) / (180 * 7 / 22)))
                                         ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
                                         (Sin((alfa - Delta1) / (180 * 7 / 22))) * (1 +
                                         (((((Sin((Phi1 + Delta1) / (180 * 7 / 22))) *
                                         (Sin(Phi1 / (180 * 7 / 22))) / ((Sin((alfa -
                                         Delta1) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7
                                         / 22))))))) ^ 0.5)) ^ 2)
                                         Ka2 = ((Sin((alfa + Phi2) / (180 * 7 / 22)))
                                         ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
                                         (Sin((alfa - Delta2) / (180 * 7 / 22))) * (1 +
                                         (((((Sin((Phi2 + Delta2) / (180 * 7 / 22))) *
                                         (Sin(Phi2 / (180 * 7 / 22))) / ((Sin((alfa -
                                         Delta2) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7
                                         / 22))))))) ^ 0.5)) ^ 2)
                                         Ka3 = ((Sin((alfa + Phi3) / (180 * 7 / 22)))
                                         ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
                                         (Sin((alfa - Delta3) / (180 * 7 / 22))) * (1 +
                                         (((((Sin((Phi3 + Delta3) / (180 * 7 / 22))) *
                                         (Sin(Phi3 / (180 * 7 / 22))) / ((Sin((alfa -
                                         Delta3) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7
                                         / 22))))))) ^ 0.5)) ^ 2)

Lapis 3="                                pesan4 = "Berat Volume Tanah Basah
pesan5 = "Berat Volume Tanah             pesan1 = "Berat Volume Tanah Basah
Terendam Lapis 4="                         Lapis 1="
Gb1 = InputBox(pesan1, "Gamma           pesan2 = "Berat Volume Tanah Basah
Basah")                                    Lapis 2="
Gb2 = InputBox(pesan2, "Gamma           pesan3 = "Berat Volume Tanah Basah
Basah")                                    Lapis 3="
Gb3 = InputBox(pesan3, "Gamma           pesan4 = "Berat Volume Tanah Basah
Basah")                                    Lapis 4="
Gb4 = InputBox(pesan4, "Gamma           Gb1 = InputBox(pesan1, "Gamma
Basah")                                    Basah")
                                         Gb2 = InputBox(pesan2, "Gamma
                                         Basah")
                                         Gb3 = InputBox(pesan3, "Gamma
                                         Basah")
                                         Gb4 = InputBox(pesan4, "Gamma
                                         Basah")
                                         xx = 0
                                         Exit Sub
                                         KKering:
                                         pesan1 = "Berat Volume Tanah Basah
                                         Lapis 1="
                                         pesan2 = "Berat Volume Tanah Basah
                                         Lapis 2="
                                         pesan3 = "Berat Volume Tanah Basah
                                         Lapis 3="
                                         pesan4 = "Berat Volume Tanah Basah
                                         Lapis 4="
                                         Gb1 = InputBox(pesan1, "Gamma
                                         Basah")
                                         Gb2 = InputBox(pesan2, "Gamma
                                         Basah")
                                         Gb3 = InputBox(pesan3, "Gamma
                                         Basah")
                                         Gb4 = InputBox(pesan4, "Gamma
                                         Basah")
                                         xx = 0
                                         Loop
                                         MDIForm1.StatusBar1.Panels("koko").Text =
                                         "Proses Optimasi ...."
                                         End Sub

```

```

Ka4 = ((Sin((alfa + Phi4) / (180 * 7 / 22))) ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) * (Sin((alfa - Delta4) / (180 * 7 / 22)))) * (1 + (((((Sin((Phi4 + Delta4) / (180 * 7 / 22))) * (Sin(Phi4 / (180 * 7 / 22)))) / ((Sin((alfa - Delta4) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 / 22)))) ^ 0.5)) ^ 2)
Kp = ((Sin((alfa - Phi3) / (180 * 7 / 22))) ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) * (Sin((alfa + Delta3) / (180 * 7 / 22)))) * (1 - (((((Sin((Phi3 + Delta3) / (180 * 7 / 22))) * (Sin(Phi3 / (180 * 7 / 22)))) / ((Sin((alfa + Delta3) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 / 22)))) ^ 0.5)) ^ 2))
End Sub
Sub Kering()
On Error Resume Next
QQ = Q
'Takanan Pasif'
Epp = 0.5 * (T2) ^ 2 * Gb4 * Kp
Cp = T2 * 2 * Ch4 * ((Kp) ^ 0.5)
Mep = Epp * (T2 / 3)
Mcp = Cp * (T2 / 2)
Mpp = Mep + Mcp
Ep = Epp + Cp

'Gaya Eksternal'
'Beban Merata Q'
Do While QQ < 0
Eq1 = (Q * L1) * Ka1
Eq2 = (Q + L1 * Gb1) * L2 * Ka2
Eq3 = (Q + L1 * Gb1 + L2 * Gb2) * L3 *
Ka3
Eq4 = (Q + L1 * Gb1 + L2 * Gb2 + L3 *
Gb3) * L4 * Ka4
Eq5 = (Q + L1 * Gb1 + L2 * Gb2 + L3 *
Gb3 + L4 * Gb4) * T2 * Ka4
QQ = 0
Loop
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Eq2
Eq3H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Eq3
Eq4H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Eq4
Eq5H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Eq5
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Eq2
Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Eq3
Eq4V = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq4
Eq5V = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq5
Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 +
H4 + T2))
Mq2H = Eq2H * ((H2 / 2) + (H3 + H4 +
T2))
Mq3H = Eq3H * ((H3 / 2) + (H4 + T2))
Mq4H = Eq4H * ((H4 / 2) + T2)
Mq5H = Eq5H * (T2 / 2)
Mq1V = Eq1V * (A + B + C + (DM1 / 2))
Mq2V = Eq2V * (A + B + C + (DM2 / 2))
Mq3V = Eq3V * (A + B + C + (DM3 / 2))
Mq4V = Eq4V * (A + B + C + (D / 2))
Mq5V = Eq5V * (L)

'Beban Tanah'
Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Ka1
Ea2 = ((L1 * Gb1) * Ka2) * L2
Ea3 = 0.5 * (L2) ^ 2 * Gb2 * Ka2
Ea4 = ((L1 * Gb1 + L2 * Gb2) * Ka3) * L3
Ea5 = 0.5 * (L3) ^ 2 * Gb3 * Ka3
Ea6 = ((L1 * Gb1 + L2 * Gb2 + L3 * Gb3) *
Ka4) * L4
Ea7 = 0.5 * (L4) ^ 2 * Gb4 * Ka4
Ea8 = ((L1 * Gb1 + L2 * Gb2 + L3 * Gb3 +
L4 * Gb4) * Ka4) * (T2)
Ea9 = 0.5 * (T2) ^ 2 * Gb4 * Ka4
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea2
Ea3H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea3
Ea4H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea4
Ea5H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea5
Ea6H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea6
Ea7H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea7
Ea8H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea8
Ea9H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea9
Ea1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea2
Ea3V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea3
Ea4V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea4

```

$$\begin{aligned}
& 22))) * Eq3 \\
& \quad Ea5V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea5 \\
& \quad Ea6V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea6 \\
& \quad Ea7V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea7 \\
& \quad Ea8V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8 \\
& \quad Ea9V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9 \\
& \quad Ma1H = Ma1H * ((H1 / 3) + (H2 + H3 + H4 + T2)) \\
& \quad Ma2H = Ma2H * ((H2 / 2) + (H3 + H4 + T2)) \\
& \quad Ma3H = Ma3H * ((H2 / 3) + (H3 + H4 + T2)) \\
& \quad Ma4H = Ma4H * ((H3 / 2) + (H4 + T2)) \\
& \quad Ma5H = Ma5H * ((H3 / 3) + (H4 + T2)) \\
& \quad Ma6H = Ma6H * ((H4 / 2) + T2) \\
& \quad Ma7H = Ma7H * ((H4 / 3) + T2) \\
& \quad Ma8H = Ma8H * (T2 / 2) \\
& \quad Ma9H = Ma9H * (T2 / 3) \\
& \quad Ma1V = Ma1V * (A + B + C + ((1 / 3) * DM1)) \\
& \quad Ma2V = Ma2V * (A + B + C + (DM2 / 2)) \\
& \quad Ma3V = Ma3V * (A + B + C + ((1 / 3) * DM2)) \\
& \quad Ma4V = Ma4V * (A + B + C + (DM3 / 2)) \\
& \quad Ma5V = Ma5V * (A + B + C + ((1 / 3) * DM3)) \\
& \quad Ma6V = Ma6V * (A + B + C + (D / 2)) \\
& \quad Ma7V = Ma7V * (A + B + C + ((1 / 3) * D)) \\
& \quad Ma8V = Ma8V * (L) \\
& \quad Ma9V = Ma9V * (L) \\
& \quad \text{'Cohesi Tanah'} \\
& \quad C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5) \\
& \quad C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5) \\
& \quad C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5) \\
& \quad C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5) \\
& \quad C5 = T2 * 2 * Ch4 * ((Ka4) ^ 0.5) \\
& \quad C1H = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1 \\
& \quad C2H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2 \\
& \quad C3H = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3 \\
& \quad C4H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4 \\
& \quad C5H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C5 \\
& \quad C1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1 \\
& \quad C2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2
\end{aligned}$$

$$\begin{aligned}
& C3V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3 \\
& C4V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4 \\
& C5V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C5 \\
& Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + T2)) \\
& Mc2H = C2H * ((H2 / 2) + (H3 + H4 + T2)) \\
& Mc3H = C3H * ((H3 / 2) + (H4 + T2)) \\
& Mc4H = C4H * ((H4 / 2) + T2) \\
& Mc5H = C5H * (T2 / 2) \\
& Mc1V = C1V * (A + B + C + (DM1 / 2)) \\
& Mc2V = C2V * (A + B + C + (DM2 / 2)) \\
& Mc3V = C3V * (A + B + C + (DM3 / 2)) \\
& Mc4V = C4V * (A + B + C + (D / 2)) \\
& Mc5V = C5V * (L) \\
& JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H \\
& JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V \\
& JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H \\
& JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V \\
& JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V \\
& JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H \\
& JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H \\
& JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V \\
& JCH = C1H + C2H + C3H + C4H + C5H \\
& JCV = C1V + C2V + C3V + C4V + C5V \\
& JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H \\
& JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V \\
& \\
& EaV = (JEqV + JEaV) - JCV \\
& Ea = (JEqH + JEaH) - JCH \\
& MaV = (JMqV + JMaV) - JMCV \\
& Ma = (JMqH + JMaH) - JMCH \\
& \\
& \text{'Gaya Internal'} \\
& \text{'Beban Merata Q'} \\
& QQ = Q \\
& \text{Do While } QQ > 0 \\
& Eq1i = (Q * L1) * Ka1 \\
& Eq2i = (Q + L1 * Ga1) * L2 * Ka2 \\
& Eq3i = (Q + L1 * Ga1 + L2 * Ga2) * L3 * Ka3 \\
& Eq4i = (Q + L1 * Ga1 + L2 * Ga2 + L3 *
\end{aligned}$$

```

Ga3) * L4 * Ka4
QQ = 0
Loop
Eq1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Eq2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Eq2i
Eq3Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Eq3i
Eq4Hi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Eq4i
Eq1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1i
Eq2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Eq2i
Eq3Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Eq3i
Eq4Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq4i
Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 +
H4))
Mq2Hi = Eq2Hi * ((H2 / 2) + (H3 + H4))
Mq3Hi = Eq3Hi * ((H3 / 2) + H4)
Mq4Hi = Eq4Hi * (H4 / 2)
Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))
Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))
Mq3Vi = Eq3Vi * (B + C + (DM3 / 2))
Mq4Vi = Eq4Vi * (B + C + (D / 2))

'Beban Tanah'
Ea1i = 0.5 * L1 ^ 2 * Ga1 * Ka1
Ea2i = (L1 * Ga1) * Ka2 * L2
Ea3i = 0.5 * L2 ^ 2 * Ga2 * Ka2
Ea4i = (L1 * Ga1 + L2 * Ga2) * Ka3 * L3
Ea5i = 0.5 * L3 ^ 2 * Ga3 * Ka3
Ea6i = (L1 * Ga1 + L2 * Ga2 + L3 * Ga3) *
Ka4 * L4
Ea7i = 0.5 * L4 ^ 2 * Ga4 * Ka4
Ea1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1i
Ea2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea2i
Ea3Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea3i
Ea4Hi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea4i
Ea5Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea5i
Ea6Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea6i
Ea7Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea7i
Ea1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1i
Ea2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea2i
Ea3Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea3i
Ea4Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Ea4i
Ea5Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea5i
Ea6Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea6i
Ea7Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea7i
Ma1Hi = Ea1Hi * ((H1 / 3) + (H2 + H3 +
H4))
Ma2Hi = Ea2Hi * ((H2 / 2) + (H3 + H4))
Ma3Hi = Ea3Hi * ((H2 / 3) + (H3 + H4))
Ma4Hi = Ea4Hi * ((H3 / 2) + H4)
Ma5Hi = Ea5Hi * ((H3 / 3) + H4)
Ma6Hi = Ea6Hi * (H4 / 2)
Ma7Hi = Ea7Hi * (H4 / 3)
Ma1Vi = Ea1Vi * (B + C + ((1 / 3) *
DM1))
Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))
Ma3Vi = Ea3Vi * (B + C + ((1 / 3) *
DM2))
Ma4Vi = Ea4Vi * (B + C + (DM3 / 2))
Ma5Vi = Ea5Vi * (B + C + ((1 / 3) *
DM3))
Ma6Vi = Ea6Vi * (B + C + (D / 2))
Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * D))

'Cohesi'
C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)
C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)
C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)
C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)
C1Hi = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C2Hi = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * C2i
C3Hi = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * C3i
C4Hi = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * C4i
C1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * C2i
C3Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * C3i
C4Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * C4i
Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 +
H4))
Mc2Hi = C2Hi * ((H2 / 2) + (H3 + H4))
Mc3Hi = C3Hi * ((H3 / 2) + H4)

```

```

Mc4Hi = C4Hi * (H4 / 2)
Mc1Vi = C1Vi * (B + C + (DM1 / 2))
Mc2Vi = C2Vi * (B + C + (DM2 / 2))
Mc3Vi = C3Vi * (B + C + (DM3 / 2))
Mc4Vi = C4Vi * (B + C + (D / 2))
JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi
JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi
JMqHi = Mq1Hi + Mq2Hi + Mq3Hi +
Mq4Hi
JMqVi = Mq1Vi + Mq2Vi + Mq3Vi +
Mq4Vi
JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi +
Ea5Vi + Ea6Vi + Ea7Vi
JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi +
Ea5Hi + Ea6Hi + Ea7Hi
JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +
Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi
JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi
JCHi = C1Hi + C2Hi + C3Hi + C4Hi
JCVi = C1Vi + C2Vi + C3Vi + C4Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +
Mc4Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +
Mc4Vi

EaVi = (JEqVi + JEaVi) - JCVi
Eai = (JEqHi + JEaHi) - JCHi
MaVi = (JMqVi + JMaVi) - JMCVi
Mai = (JMqHi + JMaHi) - JMCHi

```

End Sub

Lapis 5

```

Sub Ba1()
    'Gaya Eksternal'
    'Beban Merata Q'
    QQ = Q
    Do While QQ <> 0
        Eq1 = (Q * L1) * Kal
        Eq2 = (Q + L1 * Gal) * L2 * Ka2
        Eq3 = (Q + L1 * Gal + L2 * Ga2) * L3 *
        Ka3
        Eq4 = (Q + L1 * Gal + L2 * Ga2 + L3 *
        Ga3) * L4 * Ka4
        Eq5 = (Q + L1 * Gal + L2 * Ga2 + L3 *
        Ga3 + L4 * Ga4) * L5 * Ka5
        Eq6 = (Q + L1 * Gal + L2 * Ga2 + L3 *
        Ga3 + L4 * Ga4 + (L5) * Ga5) * T2 * Ka5
        QQ = 0
        Loop
        Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
        22))) * Eq1
        Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
        22))) * Eq2
        Eq3H = (Cos((Delta3 + lamda) / (180 * 7 /
        22))) * Eq3
        Eq4H = (Cos((Delta4 + lamda) / (180 * 7 /
        22))) * Eq4
        Eq5H = (Cos((Delta5 + lamda) / (180 * 7 /
        22))) * Eq5
        Eq6H = (Cos((Delta5 + lamda) / (180 * 7 /
        22))) * Eq6
        Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
        22))) * Eq1
        Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
        22))) * Eq2
        Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
        22))) * Eq3
        Eq4V = (Sin((Delta4 + lamda) / (180 * 7 /
        22))) * Eq4
        Eq5V = (Sin((Delta5 + lamda) / (180 * 7 /
        22))) * Eq5
        Eq6V = (Sin((Delta5 + lamda) / (180 * 7 /
        22))) * Eq6
        Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 +
        H4 + H5 + T2))
        Mq2H = Eq2H * ((H2 / 2) + (H3 + H4 +
        H5 + T2))
        Mq3H = Eq3H * ((H3 / 2) + (H4 + H5 +
        T2))
        Mq4H = Eq4H * ((H4 / 2) + (H5 + T2))
        Mq5H = Eq5H * ((H5 / 2) + T2)
        Mq6H = Eq6H * (T2 / 2)
        Mq1V = Eq1V * (A + B + C + (DM1 / 2))
        Mq2V = Eq2V * (A + B + C + (DM2 / 2))
        Mq3V = Eq3V * (A + B + C + (DM3 / 2))
        Mq4V = Eq4V * (A + B + C + (DM4 / 2))

```

$Mq5V = Eq5V * (A + B + C + (D / 2))$
 $Mq6V = Eq6V * (L)$
'Beban Tanah'
 $Ea1 = 0.5 * (L1) ^ 2 * Ga1 * Ka1$
 $Ea2 = ((L1 * Ga1) * Ka2) * L2$
 $Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2$
 $Ea4 = ((L1 * Ga1 + L2 * Ga2) * Ka3) * L3$
 $Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3$
 $Ea6 = ((L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * Ka4) * L4$
 $Ea7 = 0.5 * (L4) ^ 2 * Ga4 * Ka4$
 $Ea8 = ((L1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5) * L5$
 $Ea9 = 0.5 * (L5) ^ 2 * Ga5 * Ka5$
 $Ea10 = ((L1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4 + (L5 * Ga5)) * Ka5) * T2$
 $Ea11 = 0.5 * (T2) ^ 2 * Ga5 * Ka5$
 $Ea1H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ea1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + H5 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Ma3H = Ea3H * ((H2 / 3) + (H3 + H4 + H5 + T2))$
 $Ma4H = Ea4H * ((H3 / 2) + (H4 + H5 + T2))$
 $Ma5H = Ea5H * ((H3 / 3) + (H4 + H5 + T2))$
 $Ma6H = Ea6H * ((H4 / 2) + (H5 + T2))$
 $Ma7H = Ea7H * ((H4 / 3) + (H5 + T2))$
 $Ma8H = Ea8H * ((H5 / 2) + T2))$
 $Ma9H = Ea9H * ((H5 / 3) + T2))$
 $Ma10H = Ea10H * (T2 / 2)$
 $Ma11H = Ea11H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2))$
 $Ma4V = Ea4V * (A + B + C + (DM3 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM3))$
 $Ma6V = Ea6V * (A + B + C + (DM4 / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * DM4))$
 $Ma8V = Ea8V * (A + B + C + (D / 2))$
 $Ma9V = Ea9V * (A + B + C + ((1 / 3) * D))$
 $Ma10V = Ea10V * (L)$
 $Ma11V = Ea11V * (L)$

'Beban Air'
 $Pair = 0.5 * (L1 + L2 + L3 + L4 + L5 + T2) ^ 2 * Gw$
 $PairH = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$

$C6 = T2 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * C6$
 $C1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * C6$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + H5 + T2))$
 $Mc4H = C4H * ((H4 / 2) + (H5 + T2))$
 $Mc5H = C5H * ((H5 / 2) + T2)$
 $Mc6H = C6H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (DM4 / 2))$
 $Mc5V = C5V * (A + B + C + (D / 2))$
 $Mc6V = C6V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H$
 $+ Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V$
 $JCH = C1H + C2H + C3H + C4H + C5H + C6H$
 $JCV = C1V + C2V + C3V + C4V + C5V + C6V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H + Mc6H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V + Mc6V$
 $EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

 $'Gaya Internal'$
 $'Beban Merata Q'$
 $QQ = Q$
 $Do While QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Ga1) * L2 * Ka2$
 $Eq3i = (Q + L1 * Ga1 + L2 * Ga2) * L3 * Ka3$
 $Eq4i = (Q + L1 * Ga1 + L2 * Ga2 + L3 * Ga3) * L4 * Ka4$
 $Eq5i = (Q + L1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * L5 * Ka5$
 $QQ = 0$
 $Loop$
 $Eq1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Eq1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Vi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5))$

$Mq2Hi = Eq2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Mq3Hi = Eq3Hi * ((H3 / 2) + H4 + H5)$
 $Mq4Hi = Eq4Hi * ((H4 / 2) + H5)$
 $Mq5Hi = Eq5Hi * (H5 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (DM3 / 2))$
 $Mq4Vi = Eq4Vi * (B + C + (DM4 / 2))$
 $Mq5Vi = Eq5Vi * (B + C + (D / 2))$

'Gaya Internal'
 'Beban Tanah'
 $Eali = 0.5 * L1 ^ 2 * Gal * Kal$
 $Ea2i = (L1 * Gal) * Ka2 * L2$
 $Ea3i = 0.5 * L2 ^ 2 * Ga2 * Ka2$
 $Ea4i = (L1 * Gal + L2 * Ga2) * Ka3 * L3$
 $Ea5i = 0.5 * L3 ^ 2 * Ga3 * Ka3$
 $Ea6i = (L1 * Gal + L2 * Ga2 + L3 * Ga3) * Ka4 * L4$
 $Ea7i = 0.5 * L4 ^ 2 * Ga4 * Ka4$
 $Ea8i = (L1 * Gal + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5 * L5$
 $Ea9i = 0.5 * L5 ^ 2 * Ga5 * Ka5$
 $Ea1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 2))) * Eali$
 $Ea2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea2i$
 $Ea3Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea3i$
 $Ea4Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea4i$
 $Ea5Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea5i$
 $Ea6Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 2))) * Ea6i$
 $Ea7Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 2))) * Ea7i$
 $Ea8Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 2))) * Ea8i$
 $Ea9Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 2))) * Ea9i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 2))) * Eali$
 $Ea2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 2))) * Ea3i$
 $Ea4Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea4i$
 $Ea5Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 2))) * Ea5i$
 $Ea6Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 2))) * Ea6i$

$22))) * Ea7i$
 $Ea8Vi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 2))) * Ea8i$
 $Ea9Vi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 2))) * Ea9i$
 $Ma1Hi = Ea1Hi * ((H1 / 3) + (H2 + H3 + H4 + H5))$
 $Ma2Hi = Ea2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Ma3Hi = Ea3Hi * ((H2 / 3) + H3 + H4 + H5)$
 $Ma4Hi = Ea4Hi * ((H3 / 2) + H4 + H5)$
 $Ma5Hi = Ea5Hi * ((H3 / 3) + H4 + H5)$
 $Ma6Hi = Ea6Hi * ((H4 / 2) + H5)$
 $Ma7Hi = Ea7Hi * ((H4 / 3) + H5)$
 $Ma8Hi = Ea8Hi * (H5 / 2)$
 $Ma9Hi = Ea9Hi * (H5 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1))$
 $Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM2))$
 $Ma4Vi = Ea4Vi * (B + C + (DM3 / 2))$
 $Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * DM3))$
 $Ma6Vi = Ea6Vi * (B + C + (DM4 / 2))$
 $Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * DM4))$
 $Ma8Vi = Ea8Vi * (B + C + (D / 2))$
 $Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * D))$

'Beban Air'
 $Pairi = 0.5 * (L1 + L2 + L3 + L4 + L5) ^ 2 * Gw$
 $PairHi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 2))) * Pairi$
 $PairVi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 2))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5i = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 2))) * C1i$
 $C2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 2))) * C2i$
 $C3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 2))) * C3i$
 $C4Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 2))) * C4i$

```

Ea7Vi = (Sin((Delta4 + lamda) / (180 * 7 /
C5Hi = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * C5i
C1Vi = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * C1i
C2Vi = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * C2i
C3Vi = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * C3i
C4Vi = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * C4i
C5Vi = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * C5i
Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4
+ H5))
Mc2Hi = C2Hi * ((H2 / 2) + H3 + H4 + H5)
Mc3Hi = C3Hi * ((H3 / 2) + H4 + H5)
Mc4Hi = C4Hi * ((H4 / 2) + H5)
Mc5Hi = C5Hi * (H5 / 2)
Mc1Vi = C1Vi * (B + C + (DM1 / 2))
Mc2Vi = C2Vi * (B + C + (DM2 / 2))
Mc3Vi = C3Vi * (B + C + (DM3 / 2))
Mc4Vi = C4Vi * (B + C + (DM4 / 2))
Mc5Vi = C5Vi * (B + C + (D / 2))
JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi
+ Eq5Hi
JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi
+ Eq5Vi
JMqHi = Mq1Hi + Mq2Hi + Mq3Hi +
Mq4Hi + Mq5Hi
JMqVi = Mq1Vi + Mq2Vi + Mq3Vi +
Mq4Vi + Mq5Vi
JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi +
Ea5Vi + Ea6Vi + Ea7Vi + Ea8Vi + Ea9Vi
JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi +
Ea5Hi + Ea6Hi + Ea7Hi + Ea8Hi + Ea9Hi
JMaHi = Ma1Hi + Ma2Hi + Ma3Hi +
Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi + Ma8Hi
+ Ma9Hi
JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi + Ma8Vi
+ Ma9Vi
JCHi = C1Hi + C2Hi + C3Hi + C4Hi +
C5Hi
JCVi = C1Vi + C2Vi + C3Vi + C4Vi +
C5Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +
Mc4Hi + Mc5Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +
Mc4Vi + Mc5Vi

EaVi = (JEqVi + JEaVi) - JCVi + PairVi
Eai = (JEqHi + JEaHi) - JCHi + PairHi

MaVi = (JMqVi + JMaVi) - JMCVi +
MairVi
Mai = (JMqHi + JMaHi) - JMCHi +
MairHi

End Sub
Sub Ba2()
'Gaya Eksternal'
'Beban Merata Q'
QQ = Q
Do While QQ < 0
Eq1 = Q * (L1 - Lw1) * Ka1
Eq2 = (Q + (L1 - Lw1) * Gb1) * Lw1 *
Ka1
Eq3 = (Q + (L1 - Lw1) * Gb1 + Lw1 *
Ga1) * L2 * Ka2
Eq4 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1
+ L2 * Ga2) * L3 * Ka3
Eq5 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1
+ L2 * Ga2 + L3 * Ga3) * L4 * Ka4
Eq6 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1
+ L2 * Ga2 + L3 * Ga3 + L4 * Ga4 + L5 *
Ka5
Eq7 = (Q + (L1 - Lw1) * Gb1 + Lw1 * Ga1
+ L2 * Ga2 + L3 * Ga3 + L4 * Ga4 + L5 *
Ga5) * T2 * Ka5
QQ = 0
Loop
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq3H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Eq3
Eq4H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Eq4
Eq5H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Eq5
Eq6H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Eq6
Eq7H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Eq7
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq2
Eq3V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Eq3
Eq4V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Eq4
Eq5V = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq5
Eq6V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Eq6
Eq7V = (Sin((Delta5 + lamda) / (180 * 7 /
22)))

```

$Ea8H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 2))) * Ea8$
 $Ea9H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 2))) * Ea9$
 $Ea10H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea10$
 $Ea11H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea11$
 $Ea12H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea12$
 $Ea13H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea13$
 $Ea1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 2))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 2))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 2))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 2))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 2))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 2))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 2))) * Ea7$
 $Ea8V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 2))) * Ea8$
 $Ea9V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 2))) * Ea9$
 $Ea10V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea10$
 $Ea11V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea11$
 $Ea12V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea12$
 $Ea13V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 2))) * Ea13$
 $Ma1H = Ea1H * (((H1 - Hw1) / 3) + (Hw1 + H2 + H3 + H4 + H5 + T2))$
 $Ma2H = Ea2H * ((Hw1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Ma3H = Ea3H * ((Hw1 / 3) + (H2 + H3 + H4 + H5 + T2))$
 $Ma4H = Ea4H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Ma5H = Ea5H * ((H2 / 3) + (H3 + H4 + H5 + T2))$
 $Ma6H = Ea6H * ((H3 / 2) + (H4 + H5 + T2))$
 $Ma7H = Ea7H * ((H3 / 3) + (H4 + H5 + T2))$
 $Ma8H = Ea8H * ((H4 / 2) + (H5 + T2))$
 $Ma9H = Ea9H * ((H4 / 3) + (H5 + T2))$
 $Ma10H = Ea10H * ((H5 / 2) + T2)$

$Mq1H = Eq1H * (((H1 - Hw1) / 2) + (Hw1 + H2 + H3 + H4 + H5 + T2))$
 $Mq2H = Eq2H * ((Hw1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Mq3H = Eq3H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Mq4H = Eq4H * ((H3 / 2) + (H4 + H5 + T2))$
 $Mq5H = Eq5H * ((H4 / 2) + (H5 + T2))$
 $Mq6H = Eq6H * ((H5 / 2) + T2)$
 $Mq7H = Eq7H * (T2 / 2)$
 $Mq1V = Eq1V * (A + B + C + (DM1a / 2))$
 $Mq2V = Eq2V * (A + B + C + (DM1 / 2))$
 $Mq3V = Eq3V * (A + B + C + (DM2 / 2))$
 $Mq4V = Eq4V * (A + B + C + (DM3 / 2))$
 $Mq5V = Eq5V * (A + B + C + (DM4 / 2))$
 $Mq6V = Eq6V * (A + B + C + (D / 2))$
 $Mq7V = Eq7V * (L)$
 $'Beban Tanah'$
 $Ea1 = 0.5 * (L1 - Lw1) ^ 2 * Gb1 * Ka1$
 $Ea2 = ((L1 - Lw1) * Gb1 * Ka1) * Lw1$
 $Ea3 = 0.5 * (Lw1) ^ 2 * Ga1 * Ka1$
 $Ea4 = (((L1 - Lw1) * Gb1 + Lw1 * Ga1) * Ka2) * L2$
 $Ea5 = 0.5 * (L2) ^ 2 * Ga2 * Ka2$
 $Ea6 = (((L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2) * Ka3) * L3$
 $Ea7 = 0.5 * (L3) ^ 2 * Ga3 * Ka3$
 $Ea8 = (((L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2 + L3 * Ga3) * Ka4) * L4$
 $Ea9 = 0.5 * (L4) ^ 2 * Ga4 * Ka4$
 $Ea10 = (((L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5) * L5$
 $Ea11 = 0.5 * (L5) ^ 2 * Ga5 * Ka5$
 $Ea12 = (((L1 - Lw1) * Gb1 + Lw1 * Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4 + L5 * Ga5) * Ka5) * T2$
 $Ea13 = 0.5 * (T2) ^ 2 * Ga5 * Ka5$
 $Ea1H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 2))) * Ea1$
 $Ea2H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 2))) * Ea2$
 $Ea3H = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 2))) * Ea3$
 $Ea4H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 2))) * Ea4$
 $Ea5H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 2))) * Ea5$
 $Ea6H = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 2))) * Ea6$
 $Ea7H = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 2))) * Ea7$

$Ma11H = Ea11H * ((H5 / 3) + T2)$
 $Ma12H = Ea12H * (T2 / 2)$
 $Ma13H = Ea13H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1a))$
 $Ma2V = Ea2V * (A + B + C + (DM1 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM1))$
 $Ma4V = Ea4V * (A + B + C + (DM2 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM2))$
 $Ma6V = Ea6V * (A + B + C + (DM3 / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * DM3))$
 $Ma8V = Ea8V * (A + B + C + (DM4 / 2))$
 $Ma9V = Ea9V * (A + B + C + ((1 / 3) * DM4))$
 $Ma10V = Ea10V * (A + B + C + (D / 2))$
 $Ma11V = Ea11V * (A + B + C + ((1 / 3) * D))$
 $Ma12V = Ea12V * (L)$
 $Ma13V = Ea13V * (L)$

'Beban Air'

$Pair = 0.5 * (Lw1 + L2 + L3 + L4 + L5 + T2) ^ 2 * Gw$
 $PairH = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Pair$
 $PairV = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'

$C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C6 = T2 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * C4$
 $C5H = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * C5$
 $C6H = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * C6$
 $C1V = (\text{Sin}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * C2$

$22))) * C2$
 $C3V = (\text{Sin}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * C4$
 $C5V = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * C5$
 $C6V = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * C6$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + H5 + T2))$
 $Mc4H = C4H * ((H4 / 2) + (H5 + T2))$
 $Mc5H = C5H * ((H5 / 2) + T2)$
 $Mc6H = C6H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (DM4 / 2))$
 $Mc5V = C5V * (A + B + C + (D / 2))$
 $Mc6V = C6V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H + Eq7H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V + Eq7V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H + Mq7H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V + Mq7V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V + Ea12V + Ea13V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H + Ea12H + Ea13H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H + Ea12H + Ea13H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V + Ea12V + Ea13V$
 $JCH = C1H + C2H + C3H + C4H + C5H + C6H$
 $JCV = C1V + C2V + C3V + C4V + C5V + C6V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H + Mc6H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V + Mc6V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$

$MaV = (JMqV + JMaV) - JMcv + MairV$
 $Ma = (JMqH + JMaH) - JMch + MairH$

'Gaya Internal'
 'Beban Merata Q'
 $QQ = Q$
 Do While $QQ < 0$
 $Eq1i = (Q * L1) * Kal$
 $Eq2i = (Q + (L1 - Lw1) * Gb1) * Lw1 *$
Kal
 $Eq3i = (Q + ((L1 - Lw1) * Gb1) + Lw1 *$
 $Ga1) * L2 * Ka2$
 $Eq4i = (Q + ((L1 - Lw1) * Gb1) + Lw1 *$
 $Ga1 + L2 * Ga2) * L3 * Ka3$
 $Eq5i = (Q + ((L1 - Lw1) * Gb1) + Lw1 *$
 $Ga1 + L2 * Ga2 + L3 * Ga3) * L4 * Ka4$
 $Eq6i = (Q + ((L1 - Lw1) * Gb1) + Lw1 *$
 $Ga1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * L5$
 $* Ka5$
 $QQ = 0$
 Loop
 $Eq1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 /$
 $22))) * Eq3i$
 $Eq4Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 /$
 $22))) * Eq4i$
 $Eq5Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 /$
 $22))) * Eq5i$
 $Eq6Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 /$
 $22))) * Eq6i$
 $Eq1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 /$
 $22))) * Eq3i$
 $Eq4Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 /$
 $22))) * Eq4i$
 $Eq5Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 /$
 $22))) * Eq5i$
 $Eq6Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 /$
 $22))) * Eq6i$
 $Mq1Hi = Eq1Hi * (((H1 - Hw1) / 2) +$
 $(Hw1 + H2 + H3 + H4 + H5))$
 $Mq2Hi = Eq2Hi * ((Hw1 / 2) + (H2 + H3 +$
 $H4 + H5))$
 $Mq3Hi = Eq3Hi * ((H2 / 2) + H3 + H4 +$
 $H5)$
 $Mq4Hi = Eq4Hi * ((H3 / 2) + H4 + H5)$
 $Mq5Hi = Eq5Hi * ((H4 / 2) + H5)$
 $Mq6Hi = Eq6Hi * (H5 / 2)$

$Mq2Vi = Eq2Vi * (B + C + (DM1 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (DM2 / 2))$
 $Mq4Vi = Eq4Vi * (B + C + (DM3 / 2))$
 $Mq5Vi = Eq5Vi * (B + C + (DM4 / 2))$
 $Mq6Vi = Eq6Vi * (B + C + (D / 2))$

'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Ga1 * Kal$
 $Ea2i = ((L1 - Lw1) * Gb1) * Kal * Lw1$
 $Ea3i = 0.5 * (Lw1) ^ 2 * Ga2 * Ka2$
 $Ea4i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1) *$
 $Ka2 * L2$
 $Ea5i = 0.5 * L2 ^ 2 * Ga3 * Ka3$
 $Ea6i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 +$
 $L2 * Ga2) * Ka3 * L3$
 $Ea7i = 0.5 * L3 ^ 2 * Ga4 * Ka4$
 $Ea8i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 +$
 $L2 * Ga2 + L3 * Ga3) * Ka4 * L4$
 $Ea9i = 0.5 * L4 ^ 2 * Ga5 * Ka5$
 $Ea10i = ((L1 - Lw1) * Gb1 + Lw1 * Ga1 +$
 $L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5 * L5$
 $Ea11i = 0.5 * L5 ^ 2 * Ga5 * Ka5$
 $Ea1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Ea1i$
 $Ea2Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Ea2i$
 $Ea3Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 /$
 $22))) * Ea3i$
 $Ea4Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 /$
 $22))) * Ea4i$
 $Ea5Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 /$
 $22))) * Ea5i$
 $Ea6Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 /$
 $22))) * Ea6i$
 $Ea7Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 /$
 $22))) * Ea7i$
 $Ea8Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 /$
 $22))) * Ea8i$
 $Ea9Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 /$
 $22))) * Ea9i$
 $Ea10Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 /$
 $22))) * Ea10i$
 $Ea11Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 /$
 $22))) * Ea11i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Ea1i$
 $Ea2Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 /$
 $22))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 /$
 $22))) * Ea3i$
 $Ea4Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 /$
 $22))) * Ea4i$
 $Ea5Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 /$
 $22))) * Ea5i$

$Mq1Vi = Eq1Vi * (B + C + (DM1a / 2))$
 $Ea6Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6i$
 $Ea7Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea7i$
 $Ea8Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8i$
 $Ea9Vi = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea9i$
 $Ea10Vi = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea10i$
 $Ea11Vi = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea11i$
 $Ma1Hi = Ea1Hi * ((H1 - Hw1) / 3) + (Hw1 + H2 + H3 + H4 + H5)$
 $Ma2Hi = Ea2Hi * ((Hw1 / 2) + (H2 + H3 + H4 + H5))$
 $Ma3Hi = Ea3Hi * ((Hw1 / 3) + (H2 + H3 + H4 + H5))$
 $Ma4Hi = Ea4Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Ma5Hi = Ea5Hi * ((H2 / 3) + H3 + H4 + H5)$
 $Ma6Hi = Ea6Hi * ((H3 / 2) + H4 + H5)$
 $Ma7Hi = Ea7Hi * ((H3 / 3) + H4 + H5)$
 $Ma8Hi = Ea8Hi * ((H4 / 2) + H5)$
 $Ma9Hi = Ea9Hi * ((H4 / 3) + H5)$
 $Ma10Hi = Ea10Hi * (H5 / 2)$
 $Ma11Hi = Ea11Hi * (H5 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1a))$
 $Ma2Vi = Ea2Vi * (B + C + (DM1 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM1))$
 $Ma4Vi = Ea4Vi * (B + C + (DM2 / 2))$
 $Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * DM2))$
 $Ma6Vi = Ea6Vi * (B + C + (DM3 / 2))$
 $Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * DM3))$
 $Ma8Vi = Ea8Vi * (B + C + (DM4 / 2))$
 $Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * DM4))$
 $Ma10Vi = Ea10Vi * (B + C + (D / 2))$
 $Ma11Vi = Ea11Vi * (B + C + ((1 / 3) * D))$

'Beban Air'
 $Pairi = 0.5 * (Lw1 + L2 + L3 + L4 + L5) ^ 2 * Gw$
 $PairHi = (\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * Pairi$
 $PairVi = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5i = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C4Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i$
 $C5Hi = (\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * C5i$
 $C1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C4Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i$
 $C5Vi = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * C5i$
 $Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5))$
 $Mc2Hi = C2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Mc3Hi = C3Hi * ((H3 / 2) + H4 + H5)$
 $Mc4Hi = C4Hi * ((H4 / 2) + H5)$
 $Mc5Hi = C5Hi * (H5 / 2)$
 $Mc1Vi = C1Vi * (B + C + (DM1 / 2))$
 $Mc2Vi = C2Vi * (B + C + (DM2 / 2))$
 $Mc3Vi = C3Vi * (B + C + (DM3 / 2))$
 $Mc4Vi = C4Vi * (B + C + (DM4 / 2))$
 $Mc5Vi = C5Vi * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi + Eq5Hi + Eq6Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi + Eq5Vi + Eq6Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi + Mq4Hi + Mq5Hi + Mq6Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi + Mq5Vi + Mq6Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi + Ea5Vi + Ea6Vi + Ea7Vi + Ea8Vi + Ea9Vi + Ea10Vi + Ea11Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi + Ea5Hi + Ea6Hi + Ea7Hi + Ea8Hi + Ea9Hi + Ea10Hi + Ea11Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi + Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi + Ma8Hi$

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+ Ma9Hi + Ma10Hi + Ma11Hi
JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +
Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi + Ma8Vi
+ Ma9Vi + Ma10Vi + Ma11Vi
JCHi = C1Hi + C2Hi + C3Hi + C4Hi +
C5Hi
JCVi = C1Vi + C2Vi + C3Vi + C4Vi +
C5Vi
JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +
Mc4Hi + Mc5Hi
JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +
Mc4Vi + Mc5Vi

EqVi = (JEqVi + JEaVi) - JCVi + PairVi
Eai = (JEqHi + JEaHi) - JCHi + PairHi
MaVi = (JEqVi + JMaVi) - JMCVi +
MairVi
Mai = (JMqHi + JMaHi) - JMCHi + MairHi
End Sub
Sub Ba3()
'Gaya Eksternal'
'Beban Merata Q'
QQ = Q
Do While QQ < 0
Eq1 = (Q * L1) * Ka1
Eq2 = (Q + L1 * Gb1) * L2 * Ka2
Eq3 = (Q + L1 * Gb1 + L2 * Ga2) * L3 *
Ka3
Eq4 = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
Ga3) * L4 * Ka4
Eq5 = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
Ga3 + L4 * Ga4) * L5 * Ka5
Eq6 = (Q + L1 * Gb1 + L2 * Ga2 + L3 *
Ga3 + L4 * Ga4 + L5 * Ga5) * T2 * Ka5
QQ = 0
Loop
Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Eq2
Eq3H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Eq3
Eq4H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Eq4
Eq5H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Eq5
Eq6H = (Cos((Delta6 + lamda) / (180 * 7 /
22))) * Eq6
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Eq2
Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Eq3
Eq4V = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq4
Eq5V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Eq5
Eq6V = (Sin((Delta6 + lamda) / (180 * 7 /
22))) * Eq6
Eq1H = Eq1H * ((H1 / 2) + (H2 + H3 +
H4 + H5 + T2))
Eq2H = Eq2H * ((H2 / 2) + (H3 + H4 +
H5 + T2))
Eq3H = Eq3H * ((H3 / 2) + (H4 + H5 +
T2))
Eq4H = Eq4H * ((H4 / 2) + (H5 + T2))
Eq5H = Eq5H * ((H5 / 2) + T2)
Eq6H = Eq6H * (T2 / 2)
Eq1V = Eq1V * (A + B + C + (DM1 / 2))
Eq2V = Eq2V * (A + B + C + (DM2 / 2))
Eq3V = Eq3V * (A + B + C + (DM3 / 2))
Eq4V = Eq4V * (A + B + C + (DM4 / 2))
Eq5V = Eq5V * (A + B + C + (D / 2))
Eq6V = Eq6V * (L)

'Beban Tanah'
Ea1 = 0.5 * L1 ^ 2 * Gb1 * Ka1
Ea2 = ((L1 * Gb1) * Ka2) * L2
Ea3 = 0.5 * (L2) ^ 2 * Ga2 * Ka2
Ea4 = ((L1 * Gb1 + L2 * Ga2) * Ka3) * L3
Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
Ea6 = ((L1 * Gb1 + L2 * Ga2 + L3 * Ga3) *
Ka4) * L4
Ea7 = 0.5 * (L4) ^ 2 * Ga4 * Ka4
Ea8 = ((L1 * Gb1 + L2 * Ga2 + L3 * Ga3 +
L4 * Ga4) * Ka5) * L5
Ea9 = 0.5 * (L5) ^ 2 * Ga5 * Ka5
Ea10 = ((L1 * Gb1 + L2 * Ga2 + L3 * Ga3 +
L4 * Ga4 + (L5) * Ga5) * Ka5) * T2
Ea11 = 0.5 * (T2) ^ 2 * Ga5 * Ka5
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea2
Ea3H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea3
Ea4H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea4
Ea5H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Ea5
Ea6H = (Cos((Delta6 + lamda) / (180 * 7 /
22))) * Ea6
Ea7H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea7
Ea8H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea8
Ea9H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea9

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$Ea10H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ea1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta6 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta7 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8V = (\text{Sin}((\Delta8 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\text{Sin}((\Delta9 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10V = (\text{Sin}((\Delta10 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11V = (\text{Sin}((\Delta11 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + H5 + T2))$
 $Ma2H = Ea2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Ma3H = Ea3H * ((H3 / 2) + (H4 + H5 + T2))$
 $Ma4H = Ea4H * ((H4 / 2) + (H5 + T2))$
 $Ma5H = Ea5H * ((H5 / 3) + (H6 + H7 + T2))$
 $Ma6H = Ea6H * ((H6 / 2) + (H7 + T2))$
 $Ma7H = Ea7H * ((H7 / 3) + (H8 + T2))$
 $Ma8H = Ea8H * ((H8 / 2) + T2)$
 $Ma9H = Ea9H * ((H9 / 3) + T2)$
 $Ma10H = Ea10H * (T2 / 2)$
 $Ma11H = Ea11H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2 / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2))$
 $Ma4V = Ea4V * (A + B + C + (DM3 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM3))$
 $Ma6V = Ea6V * (A + B + C + (DM4 / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * DM4))$
 $Ma8V = Ea8V * (A + B + C + (DM5 / 2))$

$Ma10V = Ea10V * (L)$
 $Ma11V = Ea11V * (L)$
'Beban Air'
 $Pair = 0.5 * (L2 + L3 + L4 + L5 + T2) ^ 2 * Gw$
 $PairH = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$
'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C6 = T2 * 2 * Ch6 * ((Ka6) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6H = (\text{Cos}((\Delta6 + \lambda) / (180 * 7 / 22))) * C6$
 $C1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6V = (\text{Sin}((\Delta6 + \lambda) / (180 * 7 / 22))) * C6$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + H5 + T2))$
 $Mc4H = C4H * ((H4 / 2) + (H5 + T2))$
 $Mc5H = C5H * ((H5 / 2) + T2)$
 $Mc6H = C6H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$

$Ma9V = Ea9V * (A + B + C + ((1 / 3) * D))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (DM4 / 2))$
 $Mc5V = C5V * (A + B + C + (D / 2))$
 $Mc6V = C6V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V$
 $JCH = C1H + C2H + C3H + C4H + C5H + C6H$
 $JCV = C1V + C2V + C3V + C4V + C5V + C6V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H + Mc6H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V + Mc6V$
 $EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$
 'Gaya Internal'
 'Beban Merata Q'
 $QQ = Q$
 Do While $QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Gb1) * L2 * Ka2$
 $Eq3i = (Q + L1 * Gb1 + L2 * Ga2) * L3 * Ka3$
 $Eq4i = (Q + L1 * Gb1 + L2 * Ga2 + L3 * Ga3) * L4 * Ka4$
 $Eq5i = (Q + L1 * Gb1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * L5 * Ka5$
 $QQ = 0$
 Loop
 $Eq1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Hi = (\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Eq1Vi = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Vi = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Vi = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5))$
 $Mq2Hi = Eq2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Mq3Hi = Eq3Hi * ((H3 / 2) + H4 + H5)$
 $Mq4Hi = Eq4Hi * ((H4 / 2) + H5)$
 $Mq5Hi = Eq5Hi * (H5 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (DM3 / 2))$
 $Mq4Vi = Eq4Vi * (B + C + (DM4 / 2))$
 $Mq5Vi = Eq5Vi * (B + C + (D / 2))$
 'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Gb1 * Ka1$
 $Ea2i = (L1 * Gb1) * Ka2 * L2$
 $Ea3i = 0.5 * L2 ^ 2 * Ga2 * Ka2$
 $Ea4i = (L1 * Gb1 + L2 * Ga2) * Ka3 * L3$
 $Ea5i = 0.5 * L3 ^ 2 * Ga3 * Ka3$
 $Ea6i = (L1 * Gb1 + L2 * Ga2 + L3 * Ga3) * Ka4 * L4$
 $Ea7i = 0.5 * L4 ^ 2 * Ga4 * Ka4$
 $Ea8i = (L1 * Gb1 + L2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5 * L5$
 $Ea9i = 0.5 * L5 ^ 2 * Ga5 * Ka5$
 $Ea1Hi = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * E1i$
 $Ea2Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * E2i$
 $Ea3Hi = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * E3i$
 $Ea4Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * E4i$
 $Ea5Hi = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * E5i$
 $Ea6Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * E6i$
 $Ea7Hi = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * E7i$

$Ea8Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea8i$
 $Ea9Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea9i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1i$
 $Ea2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3i$
 $Ea4Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea4i$
 $Ea5Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea5i$
 $Ea6Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea6i$
 $Ea7Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea7i$
 $Ea8Vi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea8i$
 $Ea9Vi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea9i$
 $Ma1Hi = Ea1Hi * ((H1 / 3) + (H2 + H3 + H4 + H5))$
 $Ma2Hi = Ea2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Ma3Hi = Ea3Hi * ((H2 / 3) + H3 + H4 + H5)$
 $Ma4Hi = Ea4Hi * ((H3 / 2) + H4 + H5)$
 $Ma5Hi = Ea5Hi * ((H3 / 3) + H4 + H5)$
 $Ma6Hi = Ea6Hi * ((H4 / 2) + H5)$
 $Ma7Hi = Ea7Hi * ((H4 / 3) + H5)$
 $Ma8Hi = Ea8Hi * (H5 / 2)$
 $Ma9Hi = Ea9Hi * (H5 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1))$
 $Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM2))$
 $Ma4Vi = Ea4Vi * (B + C + (DM3 / 2))$
 $Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * DM3))$
 $Ma6Vi = Ea6Vi * (B + C + (DM4 / 2))$
 $Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * DM4))$
 $Ma8Vi = Ea8Vi * (B + C + (D / 2))$
 $Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * D))$

'Beban Air'
 $\text{Pairi} = 0.5 * (L2 + L3 + L4 + L5) ^ 2 * Gw$
 $\text{PairHi} = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * \text{Pairi}$
 $\text{PairVi} = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * \text{Pairi}$
 $\text{MairHi} = \text{PairHi} * (\text{Hwt} / 3)$

 $MairVi = \text{PairVi} * (B + C + ((1 / 3) * D))$

'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5i = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1Hi = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Hi = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C4Hi = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i$
 $C5Hi = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * C5i$
 $C1Vi = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * C2i$
 $C3Vi = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * C3i$
 $C4Vi = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * C4i$
 $C5Vi = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * C5i$
 $Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5))$
 $Mc2Hi = C2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Mc3Hi = C3Hi * ((H3 / 2) + H4 + H5)$
 $Mc4Hi = C4Hi * ((H4 / 2) + H5)$
 $Mc5Hi = C5Hi * (H5 / 2)$
 $Mc1Vi = C1Vi * (B + C + (DM1 / 2))$
 $Mc2Vi = C2Vi * (B + C + (DM2 / 2))$
 $Mc3Vi = C3Vi * (B + C + (DM3 / 2))$
 $Mc4Vi = C4Vi * (B + C + (DM4 / 2))$
 $Mc5Vi = C5Vi * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi + Eq5Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi + Eq5Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi + Mq4Hi + Mq5Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi + Mq5Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi + Ea5Vi + Ea6Vi + Ea7Vi + Ea8Vi + Ea9Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi + Ea5Hi + Ea6Hi + Ea7Hi + Ea8Hi + Ea9Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi + Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi + Ma8Hi + Ma9Hi$

$JMaVi = Ma1Vi + Ma2Vi + Ma3Vi +$
 $Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi + Ma8Vi$
 $+ Ma9Vi$
 $JCHi = C1Hi + C2Hi + C3Hi + C4Hi +$
 $C5Hi$
 $JCVi = C1Vi + C2Vi + C3Vi + C4Vi +$
 $C5Vi$
 $JMCHi = Mc1Hi + Mc2Hi + Mc3Hi +$
 $Mc4Hi + Mc5Hi$
 $JMCVi = Mc1Vi + Mc2Vi + Mc3Vi +$
 $Mc4Vi + Mc5Vi$
 $EaVi = (JEqVi + JEaVi) - JCVi + PairVi$
 $Eai = (JEqHi + JEaHi) - JCHi + PairHi$
 $MaVi = (JMqVi + JMaVi) - JMCVi +$
 $MairVi$
 $Mai = (JMqHi + JMaHi) - JMCHi + MairHi$
 End Sub
 Sub Ba4()
 'Gaya Eksternal'
 'Beban Merata Q'
 QQ = Q
 Do While QQ < 0
 Eq1 = (Q * L1) * Ka1
 Eq2 = (Q + L1 * Gb1) * (L2 - Lw2) * Ka2
 Eq3 = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2)
 * Lw2 * Ka2
 Eq4 = (Q + L1 * Gb1 + (L2 - Lw2) * Gb2 +
 Lw2 * Ga2) * L3 * Ka3
 Eq5 = (Q + L1 * Gb1 + (L2 - Lw2) * Ga1 +
 Lw2 * Ga2 + L3 * Ga3) * L4 * Ka4
 Eq6 = (Q + L1 * Gb1 + (L2 - Lw2) * Ga1 +
 Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4) * L5 *
 Ka5
 Eq7 = (Q + L1 * Gb1 + (L2 - Lw2) * Ga1 +
 Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4 + L5 *
 Ga5) * T2 * Ka5
 QQ = 0
 Loop
 Eq1H = (Cos((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1
 Eq2H = (Cos((Delta2 + lamda) / (180 * 7 /
 22))) * Eq2
 Eq3H = (Cos((Delta2 + lamda) / (180 * 7 /
 22))) * Eq3
 Eq4H = (Cos((Delta3 + lamda) / (180 * 7 /
 22))) * Eq4
 Eq5H = (Cos((Delta4 + lamda) / (180 * 7 /
 22))) * Eq5
 Eq6H = (Cos((Delta5 + lamda) / (180 * 7 /
 22))) * Eq6
 Eq7H = (Cos((Delta5 + lamda) / (180 * 7 /
 22))) * Eq7
 Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1
 Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
 22))) * Eq2
 Eq3V = (Sin((Delta2 + lamda) / (180 * 7 /
 22))) * Eq3
 Eq4V = (Sin((Delta3 + lamda) / (180 * 7 /
 22))) * Eq4
 Eq5V = (Sin((Delta4 + lamda) / (180 * 7 /
 22))) * Eq5
 Eq6V = (Sin((Delta5 + lamda) / (180 * 7 /
 22))) * Eq6
 Eq7V = (Sin((Delta5 + lamda) / (180 * 7 /
 22))) * Eq7
 Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 +
 H4 + H5 + T2))
 Mq2H = Eq2H * (((H2 - Hw2) / 2) + (Hw2
 + H3 + H4 + H5 + T2))
 Mq3H = Eq3H * ((Hw2 / 2) + (H3 + H4 +
 H5 + T2))
 Mq4H = Eq4H * ((H3 / 2) + (H4 + H5 +
 T2))
 Mq5H = Eq5H * ((H4 / 2) + (H5 + T2))
 Mq6H = Eq6H * ((H5 / 2) + T2)
 Mq7H = Eq7H * (T2 / 2)
 Mq1V = Eq1V * (A + B + C + (DM1 / 2))
 Mq2V = Eq2V * (A + B + C + (DM2a / 2))
 Mq3V = Eq3V * (A + B + C + (DM2 / 2))
 Mq4V = Eq4V * (A + B + C + (DM3 / 2))
 Mq5V = Eq5V * (A + B + C + (DM4 / 2))
 Mq6V = Eq6V * (A + B + C + (D / 2))
 Mq7V = Eq7V * Lw2

 'Beban Tanah'
 Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Ka1
 Ea2 = ((L1 * Gb1) * Ka2) * (L2 - Lw2)
 Ea3 = 0.5 * (L2 - Lw2) ^ 2 * Gb2 * Ka2
 Ea4 = ((L1 * Gb1 + (L2 - Lw2) * Gb2) *
 Ka2) * Lw2
 Ea5 = 0.5 * (Lw2) ^ 2 * Ga2 * Ka2
 Ea6 = (((L1 * Gb1 + (L2 - Lw2) * Gb2) +
 Lw2 * Ga2) * Ka3) * L3
 Ea7 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
 Ea8 = (((L1 * Gb1 + (L2 - Lw2) * Gb2) +
 Lw2 * Ga2 + L3 * Ga3) * Ka4) * L4
 Ea9 = 0.5 * (L4) ^ 2 * Ga4 * Ka4
 Ea10 = (((L1 * Gb1 + (L2 - Lw2) * Gb2) +
 Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5) *
 L5
 Ea11 = 0.5 * (L5) ^ 2 * Ga5 * Ka5
 Ea12 = (((L1 * Gb1 + (L2 - Lw2) * Gb2) +
 Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4 + L5 *
 Ga5) * Ka5) * T2
 Ea13 = 0.5 * (T2) ^ 2 * Ga5 * Ka5
 Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
 22))) * Eq1

$Ea2H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5H = (\text{Cos}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6H = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7H = (\text{Cos}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9H = (\text{Cos}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ea12H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea12$
 $Ea13H = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea13$
 $Ea1V = (\text{Sin}((\Delta1 + \lambda) / (180 * 7 / 22))) * Ea1$
 $Ea2V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea2$
 $Ea3V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea3$
 $Ea4V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea4$
 $Ea5V = (\text{Sin}((\Delta2 + \lambda) / (180 * 7 / 22))) * Ea5$
 $Ea6V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea6$
 $Ea7V = (\text{Sin}((\Delta3 + \lambda) / (180 * 7 / 22))) * Ea7$
 $Ea8V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea8$
 $Ea9V = (\text{Sin}((\Delta4 + \lambda) / (180 * 7 / 22))) * Ea9$
 $Ea10V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea10$
 $Ea11V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea11$
 $Ea12V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea12$
 $Ea13V = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * Ea13$
 $Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4 + H5 + T2))$
 $Ma2H = Ea2H * (((H2 - Hw2) / 2) + (Hw2 + H3 + H4 + H5))$
 $Ma3H = Ea3H * (((H2 - Hw2) / 3) + (Hw2 + H3 + H4 + H5))$
 $+ H3 + H4 + H5))$
 $Ma4H = Ea4H * ((Hw2 / 2) + (H3 + H4 + H5 + T2))$
 $Ma5H = Ea5H * ((Hw2 / 3) + (H3 + H4 + H5 + T2))$
 $Ma6H = Ea6H * ((H3 / 2) + (H4 + H5 + T2))$
 $Ma7H = Ea7H * ((H3 / 3) + (H4 + H5 + T2))$
 $Ma8H = Ea8H * ((H4 / 2) + (H5 + T2))$
 $Ma9H = Ea9H * ((H4 / 3) + (H5 + T2))$
 $Ma10H = Ea10H * ((H5 / 2) + T2))$
 $Ma11H = Ea11H * ((H5 / 3) + T2))$
 $Ma12H = Ea12H * (T2 / 2)$
 $Ma13H = Ea13H * (T2 / 3)$
 $Ma1V = Ea1V * (A + B + C + ((1 / 3) * DM1))$
 $Ma2V = Ea2V * (A + B + C + (DM2a / 2))$
 $Ma3V = Ea3V * (A + B + C + ((1 / 3) * DM2a))$
 $Ma4V = Ea4V * (A + B + C + (DM2 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM2))$
 $Ma6V = Ea6V * (A + B + C + (DM3 / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * DM3))$
 $Ma8V = Ea8V * (A + B + C + (DM4 / 2))$
 $Ma9V = Ea9V * (A + B + C + ((1 / 3) * DM4))$
 $Ma10V = Ea10V * (A + B + C + (D / 2))$
 $Ma11V = Ea11V * (A + B + C + ((1 / 3) * D))$
 $Ma12V = Ea12V * (L)$
 $Ma13V = Ea13V * (L)$

'Beban Air'

$\text{Pair} = 0.5 * ((L2 - Lw2) + L3 + L4 + L5 + T2) ^ 2 * Gw$
 $\text{PairH} = (\text{Cos}((\Delta5 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{PairV} = (\text{Sin}((\Delta5 + \lambda) / (180 * 7 / 22))) * \text{Pair}$
 $\text{MairH} = \text{PairH} * (\text{Hwt} / 3)$
 $\text{MairV} = \text{PairV} * (L)$

'Cohesi Tanah'

$C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C6 = T2 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1H = (\text{Cos}((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$

$C2H = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6H = (\text{Cos}((\Delta 6 + \lambda) / (180 * 7 / 22))) * C6$
 $C1V = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6V = (\text{Sin}((\Delta 6 + \lambda) / (180 * 7 / 22))) * C6$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + H5 + T2))$
 $Mc4H = C4H * ((H4 / 2) + (H5 + T2))$
 $Mc5H = C5H * ((H5 / 2) + T2)$
 $Mc6H = C6H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (DM4 / 2))$
 $Mc5V = C5V * (A + B + C + (D / 2))$
 $Mc6V = C6V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H + Eq7H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V + Eq7V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H + Mq7H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V + Mq7V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V + Ea12V + Ea13V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H + Ea12H + Ea13H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H + Ma12H + Ma13H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V + Ma12V + Ma13V$
 $JCH = C1H + C2H + C3H + C4H + C5H + C6H$
 $JCV = C1V + C2V + C3V + C4V + C5V + C6V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H + Mc6H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V + Mc6V$
 $EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMcv + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

 $'Gaya Internal'$
 $'Beban Merata Q'$
 $QQ = Q$
 $\text{Do While } QQ < 0$
 $Eq1i = (Q * L1) * Kal$
 $Eq2i = (Q + L1 * Gb1) * (L2 - Lw2) * Kal$
 $Eq3i = (Q + (L1 * Gb1) + (L2 - Lw2) * Gb2) * Lw2 * Ka2$
 $Eq4i = (Q + (L1 * Gb1) + (L2 - Lw2) * Gb2 + Lw2 * Ga2) * L3 * Ka3$
 $Eq5i = (Q + (L1 * Gb1) + (L2 - Lw2) * Gb2 + Lw2 * Ga2 + L3 * Ga3) * L4 * Ka4$
 $Eq6i = (Q + (L1 * Gb1) + (L2 - Lw2) * Gb2 + Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4) * L5 * Ka5$
 $QQ = 0$
 Loop
 $Eq1Hi = (\text{Cos}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\text{Cos}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Hi = (\text{Cos}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Eq6Hi = (\text{Cos}((\Delta 6 + \lambda) / (180 * 7 / 22))) * Eq6i$
 $Eq1Vi = (\text{Sin}((\Delta 1 + \lambda) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta 2 + \lambda) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta 3 + \lambda) / (180 * 7 / 22))) * Eq3i$
 $Eq4Vi = (\text{Sin}((\Delta 4 + \lambda) / (180 * 7 / 22))) * Eq4i$
 $Eq5Vi = (\text{Sin}((\Delta 5 + \lambda) / (180 * 7 / 22))) * Eq5i$
 $Eq6Vi = (\text{Sin}((\Delta 6 + \lambda) / (180 * 7 / 22))) * Eq6i$

$$\begin{aligned}
& / 22))) * Eq6i \\
& Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5)) \\
& Mq2Hi = Eq2Hi * (((H2 - Hw2) / 2) + (Hw2 + H3 + H4 + H5)) \\
& Mq3Hi = Eq3Hi * ((Hw2) / 2) + (H3 + H4 + H5) \\
& Mq4Hi = Eq4Hi * ((H3 / 2) + (H4 + H5)) \\
& Mq5Hi = Eq5Hi * ((H4 / 2) + H5) \\
& Mq6Hi = Eq6Hi * (H5 / 2) \\
& Mq1Vi = Eq1Vi * (B + C + (DM1 / 2)) \\
& Mq2Vi = Eq2Vi * (B + C + (DM2a / 2)) \\
& Mq3Vi = Eq3Vi * (B + C + (DM2 / 2)) \\
& Mq4Vi = Eq4Vi * (B + C + (DM3 / 2)) \\
& Mq5Vi = Eq5Vi * (B + C + (DM4 / 2)) \\
& Mq6Vi = Eq6Vi * (B + C + (D / ?)) \\
& 'Beban Tanah' \\
& Ea1i = 0.5 * L1 ^ 2 * Gb1 * Ka1 \\
& Ea2i = (L1 * Gb1) * Ka2 * (L2 - Lw2) \\
& Ea3i = 0.5 * (L2 - Lw2) ^ 2 * Gb2 * Ka2 \\
& Ea4i = (L1 * Gb1 + (L2 - Lw2) * Gb2) * Ka2 * Lw2 \\
& Ea5i = 0.5 * (Lw2) ^ 2 * Ga2 * Ka2 \\
& Ea6i = (L1 * Gb1 + (L2 - Lw2) * Gb2 + Lw2 * Ga2) * Ka3 * L3 \\
& Ea7i = 0.5 * (L3) ^ 2 * Ga3 * Ka3 \\
& Ea8i = (L1 * Gb1 + (L2 - Lw2) * Gb2 + Lw2 * Ga2 + L3 * Ga3) * Ka4 * L4 \\
& Ea9i = 0.5 * (L4) ^ 2 * Ga4 * Ka4 \\
& Ea10i = (L1 * Gb1 + (L2 - Lw2) * Gb2 + Lw2 * Ga2 + L3 * Ga3 + L4 * Ga4) * Ka5 * L5 \\
& Ea11i = 0.5 * (L5) ^ 2 * Ga5 * Ka5 \\
& Ea1Hi = (Cos((Delta1 + lamda) / (180 * 7 / 22))) * Ea1i \\
& Ea2Hi = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea2i \\
& Ea3Hi = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea3i \\
& Ea4Hi = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea4i \\
& Ea5Hi = (Cos((Delta2 + lamda) / (180 * 7 / 22))) * Ea5i \\
& Ea6Hi = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Ea6i \\
& Ea7Hi = (Cos((Delta3 + lamda) / (180 * 7 / 22))) * Ea7i \\
& Ea8Hi = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea8i \\
& Ea9Hi = (Cos((Delta4 + lamda) / (180 * 7 / 22))) * Ea9i \\
& Ea10Hi = (Cos((Delta5 + lamda) / (180 * 7 / 22))) * Ea10i \\
& Ea11Hi = (Cos((Delta5 + lamda) / (180 * 7 / 22))) * Ea11i \\
& Ea1Vi = (Sin((Delta1 + lamda) / (180 * 7 / 22))) * Ea1i \\
& Ea2Vi = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea2i \\
& Ea3Vi = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea3i \\
& Ea4Vi = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea4i \\
& Ea5Vi = (Sin((Delta2 + lamda) / (180 * 7 / 22))) * Ea5i \\
& Ea6Vi = (Sin((Delta3 + lamda) / (180 * 7 / 22))) * Ea6i \\
& Ea7Vi = (Sin((Delta3 + lamda) / (180 * 7 / 22))) * Ea7i \\
& Ea8Vi = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Ea8i \\
& Ea9Vi = (Sin((Delta4 + lamda) / (180 * 7 / 22))) * Ea9i \\
& Ea10Vi = (Sin((Delta5 + lamda) / (180 * 7 / 22))) * Ea10i \\
& Ea11Vi = (Sin((Delta5 + lamda) / (180 * 7 / 22))) * Ea11i \\
& Ma1Hi = Ea1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5)) \\
& Ma2Hi = Ea2Hi * (((H2 - Hw2) / 2) + (Hw2 + H3 + H4 + H5)) \\
& Ma3Hi = Ea3Hi * (((H2 - Hw2) / 3) + (Hw2 + H3 + H4 + H5)) \\
& Ma4Hi = Ea4Hi * ((Hw2) / 2) + (H3 + H4 + H5) \\
& Ma5Hi = Ea5Hi * ((Hw2) / 3) + (H3 + H4 + H5) \\
& Ma6Hi = Ea6Hi * ((H3 / 2) + (H4 + H5)) \\
& Ma7Hi = Ea7Hi * ((H3 / 3) + (H4 + H5)) \\
& Ma8Hi = Ea8Hi * ((H4 / 2) + H5) \\
& Ma9Hi = Ea9Hi * ((H4 / 3) + H5) \\
& Ma10Hi = Ea10Hi * (H5 / 2) \\
& Ma11Hi = Ea11Hi * (H5 / 3) \\
& Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1)) \\
& Ma2Vi = Ea2Vi * (B + C + (DM2a / 2)) \\
& Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM2a)) \\
& Ma4Vi = Ea4Vi * (B + C + (DM2 / 2)) \\
& Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * DM2)) \\
& Ma6Vi = Ea6Vi * (B + C + (DM3 / 2)) \\
& Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * DM3)) \\
& Ma8Vi = Ea8Vi * (B + C + (DM4 / 2)) \\
& Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * DM4)) \\
& Ma10Vi = Ea10Vi * (B + C + (D / 2)) \\
& Ma11Vi = Ea11Vi * (B + C + ((1 / 3) * D))
\end{aligned}$$

'Beban Air'
 $\text{Pairi} = 0.5 * (\text{Lw2} + \text{L3} + \text{L4} + \text{L5})^2 * \text{Gw}$
 $\text{PairHi} = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * \text{Pairi}$
 $\text{PairVi} = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * \text{Pairi}$
 $\text{MairHi} = \text{PairHi} * (\text{Hwt} / 3)$
 $\text{MairVi} = \text{PairVi} * (\text{B} + \text{C} + ((1 / 3) * \text{D}))$

'Cohesi'
 $\text{C1i} = \text{L1} * 2 * \text{Ch1} * ((\text{Ka1})^{0.5})$
 $\text{C2i} = \text{L2} * 2 * \text{Ch2} * ((\text{Ka2})^{0.5})$
 $\text{C3i} = \text{L3} * 2 * \text{Ch3} * ((\text{Ka3})^{0.5})$
 $\text{C4i} = \text{L4} * 2 * \text{Ch4} * ((\text{Ka4})^{0.5})$
 $\text{C5i} = \text{L5} * 2 * \text{Ch5} * ((\text{Ka5})^{0.5})$
 $\text{C1Hi} = (\text{Cos}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * \text{C1i}$
 $\text{C2Hi} = (\text{Cos}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * \text{C2i}$
 $\text{C3Hi} = (\text{Cos}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * \text{C3i}$
 $\text{C4Hi} = (\text{Cos}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * \text{C4i}$
 $\text{C5Hi} = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * \text{C5i}$
 $\text{C1Vi} = (\text{Sin}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * \text{C1i}$
 $\text{C2Vi} = (\text{Sin}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * \text{C2i}$
 $\text{C3Vi} = (\text{Sin}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * \text{C3i}$
 $\text{C4Vi} = (\text{Sin}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * \text{C4i}$
 $\text{C5Vi} = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * \text{C5i}$
 $\text{Mc1Hi} = \text{C1Hi} * ((\text{H1} / 2) + (\text{H2} + \text{H3} + \text{H4} + \text{H5}))$
 $\text{Mc2Hi} = \text{C2Hi} * ((\text{H2} / 2) + \text{H3} + \text{H4} + \text{H5})$
 $\text{Mc3Hi} = \text{C3Hi} * ((\text{H3} / 2) + \text{H4} + \text{H5})$
 $\text{Mc4Hi} = \text{C4Hi} * ((\text{H4} / 2) + \text{H5})$
 $\text{Mc5Hi} = \text{C5Hi} * (\text{H5} / 2)$
 $\text{Mc1Vi} = \text{C1Vi} * (\text{B} + \text{C} + (\text{DM1} / 2))$
 $\text{Mc2Vi} = \text{C2Vi} * (\text{B} + \text{C} + (\text{DM2} / 2))$
 $\text{Mc3Vi} = \text{C3Vi} * (\text{B} + \text{C} + (\text{DM3} / 2))$
 $\text{Mc4Vi} = \text{C4Vi} * (\text{B} + \text{C} + (\text{DM4} / 2))$
 $\text{Mc5Vi} = \text{C5Vi} * (\text{B} + \text{C} + (\text{D} / 2))$
 $\text{JEqHi} = \text{Eq1Hi} + \text{Eq2Hi} + \text{Eq3Hi} + \text{Eq4Hi} + \text{Eq5Hi} + \text{Eq6Hi}$
 $\text{JEqVi} = \text{Eq1Vi} + \text{Eq2Vi} + \text{Eq3Vi} + \text{Eq4Vi} + \text{Eq5Vi} + \text{Eq6Vi}$
 $\text{JMqHi} = \text{Mq1Hi} + \text{Mq2Hi} + \text{Mq3Hi} + \text{Mq4Hi} + \text{Mq5Hi} + \text{Mq6Hi}$
 $\text{JMqVi} = \text{Mq1Vi} + \text{Mq2Vi} + \text{Mq3Vi} + \text{Mq4Vi} + \text{Mq5Vi} + \text{Mq6Vi}$
 $\text{JEaVi} = \text{Ea1Vi} + \text{Ea2Vi} + \text{Ea3Vi} + \text{Ea4Vi} + \text{Ea5Vi} + \text{Ea6Vi} + \text{Ea7Vi} + \text{Ea8Vi} + \text{Ea9Vi} + \text{Ea10Vi} + \text{Ea11Vi}$
 $\text{JEaHi} = \text{Ea1Hi} + \text{Ea2Hi} + \text{Ea3Hi} + \text{Ea4Hi} + \text{Ea5Hi} + \text{Ea6Hi} + \text{Ea7Hi} + \text{Ea8Hi} + \text{Ea9Hi} + \text{Ea10Hi} + \text{Ea11Hi}$
 $\text{JMaHi} = \text{Ma1Hi} + \text{Ma2Hi} + \text{Ma3Hi} + \text{Ma4Hi} + \text{Ma5Hi} + \text{Ma6Hi} + \text{Ma7Hi} + \text{Ma8Hi} + \text{Ma9Hi} + \text{Ma10Hi} + \text{Ma11Hi}$
 $\text{JMaVi} = \text{Ma1Vi} + \text{Ma2Vi} + \text{Ma3Vi} + \text{Ma4Vi} + \text{Ma5Vi} + \text{Ma6Vi} + \text{Ma7Vi} + \text{Ma8Vi} + \text{Ma9Vi} + \text{Ma10Vi} + \text{Ma11Vi}$
 $\text{JCHi} = \text{C1Hi} + \text{C2Hi} + \text{C3Hi} + \text{C4Hi} + \text{C5Hi}$
 $\text{JCVi} = \text{C1Vi} + \text{C2Vi} + \text{C3Vi} + \text{C4Vi} + \text{C5Vi}$
 $\text{JMCHi} = \text{Mc1Hi} + \text{Mc2Hi} + \text{Mc3Hi} + \text{Mc4Hi} + \text{Mc5Hi}$
 $\text{JMCVi} = \text{Mc1Vi} + \text{Mc2Vi} + \text{Mc3Vi} + \text{Mc4Vi} + \text{Mc5Vi}$

$\text{EaVi} = (\text{JEqVi} + \text{JEaVi}) - \text{JCVi} + \text{PairVi}$
 $\text{Eai} = (\text{JEqHi} + \text{JEaHi}) - \text{JCHi} + \text{PairHi}$
 $\text{MaVi} = (\text{JMqVi} + \text{JMaVi}) - \text{JMCVi} + \text{MairVi}$
 $\text{Mai} = (\text{JMqHi} + \text{JMaHi}) - \text{JMCHi} + \text{MairHi}$

End Sub
Sub Ba5()
'Gaya Eksternal'
'Beban Merata Q'
 $\text{QQ} = \text{Q}$
Do While $\text{QQ} > 0$
 $\text{Eq1} = (\text{Q} * \text{L1}) * \text{Ka1}$
 $\text{Eq2} = (\text{Q} + \text{L1} * \text{Gb1}) * \text{L2} * \text{Ka2}$
 $\text{Eq3} = (\text{Q} + \text{L1} * \text{Gb1} + \text{L2} * \text{Gb2}) * \text{L3} * \text{Ka3}$
 $\text{Eq4} = (\text{Q} + \text{L1} * \text{Gb1} + \text{L2} * \text{Gb2} + \text{L3} * \text{Ga3}) * \text{L4} * \text{Ka4}$
 $\text{Eq5} = (\text{Q} + \text{L1} * \text{Gb1} + \text{L2} * \text{Gb2} + \text{L3} * \text{Ga3} + \text{L4} * \text{Ga4}) * \text{L5} * \text{Ka5}$
 $\text{Eq6} = (\text{Q} + \text{L1} * \text{Gb1} + \text{L2} * \text{Gb2} + \text{L3} * \text{Ga3} + \text{L4} * \text{Ga4} + \text{L5} * \text{Ga5}) * \text{T2} * \text{Ka5}$
 $\text{QQ} = 0$
Loop
 $\text{Eq1H} = (\text{Cos}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq1}$
 $\text{Eq2H} = (\text{Cos}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq2}$
 $\text{Eq3H} = (\text{Cos}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq3}$
 $\text{Eq4H} = (\text{Cos}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq4}$
 $\text{Eq5H} = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * \text{Eq5}$

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22))) * Eq5
Eq6H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Eq6
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Eq1
Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Eq2
Eq3V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Eq3
Eq4V = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Eq4
Eq5V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Eq5
Eq6V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Eq6
Mq1H = Eq1H * ((H1 / 2) + (H2 + H3 + H4
+ H5 + T2))
Mq2H = Eq2H * ((H2 / 2) + (H3 + H4 + H5
+ T2))
Mq3H = Eq3H * ((H3 / 2) + (H4 + H5 +
T2))
Mq4H = Eq4H * ((H4 / 2) + (H5 + T2))
Mq5H = Eq5H * ((H5 / 2) + T2)
Mq6H = Eq6H * (T2 / 2)
Mq1V = Eq1V * (A + B + C + (DM1 / 2))
Mq2V = Eq2V * (A + B + C + (DM2 / 2))
Mq3V = Eq3V * (A + B + C + (DM3 / 2))
Mq4V = Eq4V * (A + B + C + (DM4 / 2))
Mq5V = Eq5V * (A + B + C + (D / 2))
Mq6V = Eq6V * (L)

'Beban Tanah'
Ea1 = 0.5 * (L1) ^ 2 * Gb1 * Ka1
Ea2 = ((L1 * Gb1) * Ka2) * L2
Ea3 = 0.5 * (L2) ^ 2 * Gb2 * Ka2
Ea4 = ((L1 * Gb1 + L2 * Gb2) * Ka3) * L3
Ea5 = 0.5 * (L3) ^ 2 * Ga3 * Ka3
Ea6 = ((L1 * Gb1 + L2 * Gb2 + L3 * Ga3) *
Ka4) * L4
Ea7 = 0.5 * (L4) ^ 2 * Ga4 * Ka4
Ea8 = ((L1 * Gb1 + L2 * Gb2 + L3 * Ga3 +
L4 * Ga4) * Ka5) * L5
Ea9 = 0.5 * (L5) ^ 2 * Ga5 * Ka5
Ea10 = ((L1 * Gb1 + L2 * Gb2 + L3 * Ga3 +
L4 * Ga4 + L5 * Ga5) * Ka5) * T2
Ea11 = 0.5 * (T2) ^ 2 * Ga5 * Ka5
Ea1H = (Cos((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Ea2H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea2
Ea3H = (Cos((Delta2 + lamda) / (180 * 7 /
22))) * Ea3
Ea4H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea4
Ea5H = (Cos((Delta3 + lamda) / (180 * 7 /
22))) * Ea5
Eq6H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea6
Eq7H = (Cos((Delta4 + lamda) / (180 * 7 /
22))) * Ea7
Eq8H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Ea8
Eq9H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Ea9
Eq10H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Ea10
Eq11H = (Cos((Delta5 + lamda) / (180 * 7 /
22))) * Ea11
Eq1V = (Sin((Delta1 + lamda) / (180 * 7 /
22))) * Ea1
Eq2V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea2
Eq3V = (Sin((Delta2 + lamda) / (180 * 7 /
22))) * Ea3
Eq4V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea4
Eq5V = (Sin((Delta3 + lamda) / (180 * 7 /
22))) * Ea5
Eq6V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Ea6
Eq7V = (Sin((Delta4 + lamda) / (180 * 7 /
22))) * Ea7
Eq8V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Ea8
Eq9V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Ea9
Eq10V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Ea10
Eq11V = (Sin((Delta5 + lamda) / (180 * 7 /
22))) * Ea11
Ma1H = Ea1H * ((H1 / 3) + (H2 + H3 + H4
+ H5 + T2))
Ma2H = Ea2H * ((H2 / 2) + (H3 + H4 + H5
+ T2))
Ma3H = Ea3H * ((H2 / 3) + (H3 + H4 + H5
+ T2))
Ma4H = Ea4H * ((H3 / 2) + (H4 + H5 +
T2))
Ma5H = Ea5H * ((H3 / 3) + (H4 + H5 +
T2))
Ma6H = Ea6H * ((H4 / 2) + (H5 + T2))
Ma7H = Ea7H * ((H4 / 3) + (H5 + T2))
Ma8H = Ea8H * ((H5 / 2) + T2)
Ma9H = Ea9H * ((H5 / 3) + T2)
Ma10H = Ea10H * (T2 / 2)
Ma11H = Ea11H * (T2 / 3)
Ma1V = Ea1V * (A + B + C + ((1 / 3) *
DM1))
Ma2V = Ea2V * (A + B + C + (DM2 / 2))
Ma3V = Ea3V * (A + B + C + ((1 / 3) * +

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DM2))
 $Ma4V = Ea4V * (A + B + C + (DM3 / 2))$
 $Ma5V = Ea5V * (A + B + C + ((1 / 3) * DM3))$
 $Ma6V = Ea6V * (A + B + C + (DM4 / 2))$
 $Ma7V = Ea7V * (A + B + C + ((1 / 3) * DM4))$
 $Ma8V = Ea8V * (A + B + C + (D / 2))$
 $Ma9V = Ea9V * (A + B + C + ((1 / 3) * D))$
 $Ma10V = Ea10V * (L)$
 $Ma11V = Ea11V * (L)$

'Beban Air'
 $Pair = 0.5 * (L3 + L4 + L5 + T2) ^ 2 * Gw$
 $PairH = (\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * Pair$
 $PairV = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * Pair$
 $MairH = PairH * (Hwt / 3)$
 $MairV = PairV * (L)$

'Cohesi Tanah'
 $C1 = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2 = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3 = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4 = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5 = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C6 = T2 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1H = (\cos((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2H = (\cos((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3H = (\cos((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4H = (\cos((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5H = (\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6H = (\cos((\Delta5 + \lambda) / (180 * 7 / 22))) * C6$
 $C1V = (\sin((\Delta1 + \lambda) / (180 * 7 / 22))) * C1$
 $C2V = (\sin((\Delta2 + \lambda) / (180 * 7 / 22))) * C2$
 $C3V = (\sin((\Delta3 + \lambda) / (180 * 7 / 22))) * C3$
 $C4V = (\sin((\Delta4 + \lambda) / (180 * 7 / 22))) * C4$
 $C5V = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * C5$
 $C6V = (\sin((\Delta5 + \lambda) / (180 * 7 / 22))) * C6$
 $Mc1H = C1H * ((H1 / 2) + (H2 + H3 + H4 + H5 + T2))$
 $Mc2H = C2H * ((H2 / 2) + (H3 + H4 + H5 + T2))$
 $Mc3H = C3H * ((H3 / 2) + (H4 + H5 + T2))$
 $Mc4H = C4H * ((H4 / 2) + (H5) + T2)$
 $Mc5H = C5H * ((H5 / 2) + T2)$
 $Mc6H = C6H * (T2 / 2)$
 $Mc1V = C1V * (A + B + C + (DM1 / 2))$
 $Mc2V = C2V * (A + B + C + (DM2 / 2))$
 $Mc3V = C3V * (A + B + C + (DM3 / 2))$
 $Mc4V = C4V * (A + B + C + (DM4 / 2))$
 $Mc5V = C5V * (A + B + C + (D / 2))$
 $Mc6V = C6V * (L)$
 $JEqH = Eq1H + Eq2H + Eq3H + Eq4H + Eq5H + Eq6H$
 $JEqV = Eq1V + Eq2V + Eq3V + Eq4V + Eq5V + Eq6V$
 $JMqH = Mq1H + Mq2H + Mq3H + Mq4H + Mq5H + Mq6H$
 $JMqV = Mq1V + Mq2V + Mq3V + Mq4V + Mq5V + Mq6V$
 $JEaV = Ea1V + Ea2V + Ea3V + Ea4V + Ea5V + Ea6V + Ea7V + Ea8V + Ea9V + Ea10V + Ea11V$
 $JEaH = Ea1H + Ea2H + Ea3H + Ea4H + Ea5H + Ea6H + Ea7H + Ea8H + Ea9H + Ea10H + Ea11H$
 $JMaH = Ma1H + Ma2H + Ma3H + Ma4H + Ma5H + Ma6H + Ma7H + Ma8H + Ma9H + Ma10H + Ma11H$
 $JMaV = Ma1V + Ma2V + Ma3V + Ma4V + Ma5V + Ma6V + Ma7V + Ma8V + Ma9V + Ma10V + Ma11V$
 $JCH = C1H + C2H + C3H + C4H + C5H + C6H$
 $JCV = C1V + C2V + C3V + C4V + C5V + C6V$
 $JMCH = Mc1H + Mc2H + Mc3H + Mc4H + Mc5H + Mc6H$
 $JMCV = Mc1V + Mc2V + Mc3V + Mc4V + Mc5V + Mc6V$

$EaV = (JEqV + JEaV) - JCV + PairV$
 $Ea = (JEqH + JEaH) - JCH + PairH$
 $MaV = (JMqV + JMaV) - JMCV + MairV$
 $Ma = (JMqH + JMaH) - JMCH + MairH$

'Gaya Internal'
'Beban Merata Q'
 $QQ = Q$
Do While $QQ < 0$
 $Eq1i = (Q * L1) * Ka1$
 $Eq2i = (Q + L1 * Gb1) * L2 * Ka2$
 $Eq3i = (Q + L1 * Gb1 + L2 * Gb2) * L3 * Ka3$
 $Eq4i = (Q + L1 * Gb1 + L2 * Gb2 + L3 * Ka4) * L4 * Ka4$

$Ga3) * L4 * Ka4$
 $Eq5i = (Q + L1 * Gb1 + L2 * Gb2 + L3 * Ga3 + L4 * Ga4) * L5 * Ka5$
 $QQ = 0$
 $Loop$
 $Eq1Hi = (\text{Cos}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * Eq1i$
 $Eq2Hi = (\text{Cos}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * Eq2i$
 $Eq3Hi = (\text{Cos}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * Eq3i$
 $Eq4Hi = (\text{Cos}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * Eq4i$
 $Eq5Hi = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Eq5i$
 $Eq1Vi = (\text{Sin}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * Eq1i$
 $Eq2Vi = (\text{Sin}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * Eq2i$
 $Eq3Vi = (\text{Sin}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * Eq3i$
 $Eq4Vi = (\text{Sin}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * Eq4i$
 $Eq5Vi = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Eq5i$
 $Mq1Hi = Eq1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5))$
 $Mq2Hi = Eq2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Mq3Hi = Eq3Hi * ((H3 / 2) + H4 + H5)$
 $Mq4Hi = Eq4Hi * ((H4 / 2) + H5)$
 $Mq5Hi = Eq5Hi * (H5 / 2)$
 $Mq1Vi = Eq1Vi * (B + C + (DM1 / 2))$
 $Mq2Vi = Eq2Vi * (B + C + (DM2 / 2))$
 $Mq3Vi = Eq3Vi * (B + C + (DM3 / 2))$
 $Mq4Vi = Eq4Vi * (B + C + (DM4 / 2))$
 $Mq5Vi = Eq5Vi * (B + C + (D / 2))$

'Beban Tanah'
 $Ea1i = 0.5 * L1 ^ 2 * Gb1 * Ka1$
 $Ea2i = (L1 * Gb1) * Ka2 * L2$
 $Ea3i = 0.5 * L2 ^ 2 * Gb2 * Ka2$
 $Ea4i = (L1 * Gb1 + L2 * Gb2) * Ka3 * L3$
 $Ea5i = 0.5 * L3 ^ 2 * Ga3 * Ka3$
 $Ea6i = (L1 * Gb1 + L2 * Gb2 + L3 * Ga3) * Ka4 * L4$
 $Ea7i = 0.5 * L4 ^ 2 * Ga4 * Ka4$
 $Ea8i = (L1 * Gb1 + L2 * Gb2 + L3 * Ga3 + L4 * Ga4) * Ka5 * L5$
 $Ea9i = 0.5 * L5 ^ 2 * Ga5 * Ka5$
 $Ea1Hi = (\text{Cos}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * Ea1i$
 $Ea2Hi = (\text{Cos}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * Ea2i$
 $Ea3Hi = (\text{Cos}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * Ea3i$
 $Ea4Hi = (\text{Cos}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * Ea4i$
 $Ea5Hi = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Ea5i$
 $Ea6Hi = (\text{Cos}((\Delta6 + \text{lamda}) / (180 * 7 / 22))) * Ea6i$
 $Ea7Hi = (\text{Cos}((\Delta7 + \text{lamda}) / (180 * 7 / 22))) * Ea7i$
 $Ea8Hi = (\text{Cos}((\Delta8 + \text{lamda}) / (180 * 7 / 22))) * Ea8i$
 $Ea9Hi = (\text{Cos}((\Delta9 + \text{lamda}) / (180 * 7 / 22))) * Ea9i$
 $Ea1Vi = (\text{Sin}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * Ea1i$
 $Ea2Vi = (\text{Sin}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * Ea2i$
 $Ea3Vi = (\text{Sin}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * Ea3i$
 $Ea4Vi = (\text{Sin}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * Ea4i$
 $Ea5Vi = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Ea5i$
 $Ea6Vi = (\text{Sin}((\Delta6 + \text{lamda}) / (180 * 7 / 22))) * Ea6i$
 $Ea7Vi = (\text{Sin}((\Delta7 + \text{lamda}) / (180 * 7 / 22))) * Ea7i$
 $Ea8Vi = (\text{Sin}((\Delta8 + \text{lamda}) / (180 * 7 / 22))) * Ea8i$
 $Ea9Vi = (\text{Sin}((\Delta9 + \text{lamda}) / (180 * 7 / 22))) * Ea9i$
 $Ma1Hi = Ea1Hi * ((H1 / 3) + (H2 + H3 + H4 + H5))$
 $Ma2Hi = Ea2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Ma3Hi = Ea3Hi * ((H2 / 3) + H3 + H4 + H5)$
 $Ma4Hi = Ea4Hi * ((H3 / 2) + H4 + H5)$
 $Ma5Hi = Ea5Hi * ((H3 / 3) + H4 + H5)$
 $Ma6Hi = Ea6Hi * ((H4 / 2) + H5)$
 $Ma7Hi = Ea7Hi * ((H4 / 3) + H5)$
 $Ma8Hi = Ea8Hi * (H5 / 2)$
 $Ma9Hi = Ea9Hi * (H5 / 3)$
 $Ma1Vi = Ea1Vi * (B + C + ((1 / 3) * DM1))$
 $Ma2Vi = Ea2Vi * (B + C + (DM2 / 2))$
 $Ma3Vi = Ea3Vi * (B + C + ((1 / 3) * DM2))$
 $Ma4Vi = Ea4Vi * (B + C + (DM3 / 2))$
 $Ma5Vi = Ea5Vi * (B + C + ((1 / 3) * DM3))$
 $Ma6Vi = Ea6Vi * (B + C + (DM4 / 2))$
 $Ma7Vi = Ea7Vi * (B + C + ((1 / 3) * DM4))$
 $Ma8Vi = Ea8Vi * (B + C + (D / 2))$

$Ma9Vi = Ea9Vi * (B + C + ((1 / 3) * D))$
 'Beban Air'
 $Pairi = 0.5 * (L3 + L4 + L5) ^ 2 * Gw$
 $PairHi = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Pairi$
 $PairVi = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * Pairi$
 $MairHi = PairHi * (Hwt / 3)$
 $MairVi = PairVi * (B + C + ((1 / 3) * D))$

 'Cohesi'
 $C1i = L1 * 2 * Ch1 * ((Ka1) ^ 0.5)$
 $C2i = L2 * 2 * Ch2 * ((Ka2) ^ 0.5)$
 $C3i = L3 * 2 * Ch3 * ((Ka3) ^ 0.5)$
 $C4i = L4 * 2 * Ch4 * ((Ka4) ^ 0.5)$
 $C5i = L5 * 2 * Ch5 * ((Ka5) ^ 0.5)$
 $C1Hi = (\text{Cos}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * C1i$
 $C2Hi = (\text{Cos}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * C2i$
 $C3Hi = (\text{Cos}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * C3i$
 $C4Hi = (\text{Cos}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * C4i$
 $C5Hi = (\text{Cos}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * C5i$
 $C1Vi = (\text{Sin}((\Delta1 + \text{lamda}) / (180 * 7 / 22))) * C1i$
 $C2Vi = (\text{Sin}((\Delta2 + \text{lamda}) / (180 * 7 / 22))) * C2i$
 $C3Vi = (\text{Sin}((\Delta3 + \text{lamda}) / (180 * 7 / 22))) * C3i$
 $C4Vi = (\text{Sin}((\Delta4 + \text{lamda}) / (180 * 7 / 22))) * C4i$
 $C5Vi = (\text{Sin}((\Delta5 + \text{lamda}) / (180 * 7 / 22))) * C5i$
 $Mc1Hi = C1Hi * ((H1 / 2) + (H2 + H3 + H4 + H5))$
 $Mc2Hi = C2Hi * ((H2 / 2) + H3 + H4 + H5)$
 $Mc3Hi = C3Hi * ((H3 / 2) + H4 + H5)$
 $Mc4Hi = C4Hi * ((H4 / 2) + H5)$
 $Mc5Hi = C5Hi * (H5 / 2)$
 $Mc1Vi = C1Vi * (B + C + (DM1 / 2))$
 $Mc2Vi = C2Vi * (B + C + (DM2 / 2))$
 $Mc3Vi = C3Vi * (B + C + (DM3 / 2))$
 $Mc4Vi = C4Vi * (B + C + (DM4 / 2))$
 $Mc5Vi = C5Vi * (B + C + (D / 2))$
 $JEqHi = Eq1Hi + Eq2Hi + Eq3Hi + Eq4Hi + Eq5Hi$
 $JEqVi = Eq1Vi + Eq2Vi + Eq3Vi + Eq4Vi + Eq5Vi$
 $JMqHi = Mq1Hi + Mq2Hi + Mq3Hi + Mq4Hi + Mq5Hi$
 $JMqVi = Mq1Vi + Mq2Vi + Mq3Vi + Mq4Vi + Mq5Vi$
 $JEaVi = Ea1Vi + Ea2Vi + Ea3Vi + Ea4Vi + Ea5Vi + Ea6Vi + Ea7Vi + Ea8Vi + Ea9Vi$
 $JEaHi = Ea1Hi + Ea2Hi + Ea3Hi + Ea4Hi + Ea5Hi + Ea6Hi + Ea7Hi + Ea8Hi + Ea9Hi$
 $JMaHi = Ma1Hi + Ma2Hi + Ma3Hi + Ma4Hi + Ma5Hi + Ma6Hi + Ma7Hi + Ma8Hi + Ma9Hi$
 $JMaVi = Ma1Vi + Ma2Vi + Ma3Vi + Ma4Vi + Ma5Vi + Ma6Vi + Ma7Vi + Ma8Vi + Ma9Vi$
 $JCHi = C1Hi + C2Hi + C3Hi + C4Hi + C5Hi$
 $JCVi = C1Vi + C2Vi + C3Vi + C4Vi + C5Vi$
 $JMCHi = Mc1Hi + Mc2Hi + Mc3Hi + Mc4Hi + Mc5Hi$
 $JMCVi = Mc1Vi + Mc2Vi + Mc3Vi + Mc4Vi + Mc5Vi$

 $EaVi = (JEqVi + JEaVi) - JCVi + PairVi$
 $Eai = (JEqHi + JEaHi) - JCHi + PairHi$
 $MaVi = (JMqVi + JMaVi) - JMCVi + MairVi$
 $Mai = (JMqHi + JMaHi) - JMCHi + MairHi$
 End Sub
 Sub Gammatnh()
 On Error Resume Next
 Do While xx <> 0
 MDIForm1.StatusBar1.Panels("koko").Text = "Data berat volume tanah"
 $H1 = Text3.Text$
 $H2 = Text7.Text$
 $H3 = Text11.Text$
 $H4 = Text15.Text$
 $H5 = Text19.Text$
 If Option1.Value = True Then GoTo BBasah
 If Option2.Value = True Then GoTo KKering
 BBasah:
 If Ht = Hwt Then
 $\text{pesan1} = \text{"Berat Volume Tanah Terendam Lapis 1="}$
 $\text{pesan2} = \text{"Berat Volume Tanah Terendam Lapis 2="}$
 $\text{pesan3} = \text{"Berat Volume Tanah Terendam Lapis 3="}$
 $\text{pesan4} = \text{"Berat Volume Tanah Terendam Lapis 4="}$
 $\text{pesan5} = \text{"Berat Volume Tanah Terendam Lapis 5="}$
 $G1 = InputBox(\text{pesan1}, \text{"Gamma Aksen"})$

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Ga2 = InputBox(pesan2, "Gamma
Aksen")
Ga3 = InputBox(pesan3, "Gamma
Aksen")
Ga4 = InputBox(pesan4, "Gamma
Aksen")
Ga5 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt > (H2 + H3 + H4 + H5) And (H2 +
H3 + H4 + H5) > Hwt Then
pesan1 = "Berat Volume Tanah Basah
Lapis 1="
pesan2 = "Berat Volume Tanah Basah
Lapis 2="
pesan3 = "Berat Volume Tanah
Terendam Lapis 2="
pesan4 = "Berat Volume Tanah
Terendam Lapis 3="
pesan5 = "Berat Volume Tanah
Terendam Lapis 4="
pesan6 = "Berat Volume Tanah
Terendam Lapis 5="
Gb1 = InputBox(pesan1, "Gamma
Basah")
Gb2 = InputBox(pesan2, "Gamma
Basah")
Gb3 = InputBox(pesan3, "Gamma
Aksen")
Gb4 = InputBox(pesan4, "Gamma
Aksen")
Gb5 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt = (H2 + H3 + H4 + H5) And
Ht > Hwt Then
pesan1 = "Berat Volume Tanah Basah
Lapis 1="
pesan2 = "Berat Volume Tanah
Terendam Lapis 2="
pesan3 = "Berat Volume Tanah
Terendam Lapis 3="
pesan4 = "Berat Volume Tanah
Terendam Lapis 4="
pesan5 = "Berat Volume Tanah
Terendam Lapis 5="
Gb1 = InputBox(pesan1, "Gamma
Basah")
Gb2 = InputBox(pesan2, "Gamma
Basah")
Gb3 = InputBox(pesan3, "Gamma
Aksen")
Gb4 = InputBox(pesan4, "Gamma
Aksen")
Gb5 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt > (H4 + H5) And (H3 + H4 +
H5) > Hwt Then
pesan1 = "Berat Volume Tanah Basah
Lapis 1="
pesan2 = "Berat Volume Tanah Basah
Lapis 2="

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pesan3 = "Berat Volume Tanah Basah
Lapis 3="
pesan4 = "Berat Volume Tanah
Terendam Lapis 3="
pesan5 = "Berat Volume Tanah
Terendam Lapis 4="
pesan6 = "Berat Volume Tanah
Terendam Lapis 5="
Gb1 = InputBox(pesan1, "Gamma
Basah")
Gb2 = InputBox(pesan2, "Gamma
Basah")
Gb3 = InputBox(pesan3, "Gamma
Basah")
Gb4 = InputBox(pesan4, "Gamma
Basah")
Ga4 = InputBox(pesan5, "Gamma
Aksen")
Ga5 = InputBox(pesan6, "Gamma
Aksen")
ElseIf Hwt = (H4 + H5) And (H3 + H4 +
H5) > Hwt Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="
    pesan4 = "Berat Volume Tanah
Terendam Lapis 4="
    pesan5 = "Berat Volume Tanah
Terendam Lapis 5="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")
    Ga4 = InputBox(pesan4, "Gamma
Aksen")
    Ga5 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt > (H5) And (H4 + H5) > Hwt
Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="
    pesan4 = "Berat Volume Tanah Basah
Lapis 4="
    pesan5 = "Berat Volume Tanah
Terendam Lapis 4="
    pesan6 = "Berat Volume Tanah
Terendam Lapis 5="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")
    Ga4 = InputBox(pesan4, "Gamma
Aksen")
    Ga5 = InputBox(pesan5, "Gamma
Aksen")
ElseIf Hwt < (H5) And (H4 + H5) > Hwt
Then
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="
    pesan4 = "Berat Volume Tanah Basah
Lapis 4="
    pesan5 = "Berat Volume Tanah
Terendam Lapis 5="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")

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Gb4 = InputBox(pesan4, "Gamma
Basah")
Gb5 = InputBox(pesan5, "Gamma
Basah")
Ga5 = InputBox(pesan6, "Gamma
Aksen")
End If
    xx = 0
    Exit Sub
KKering:
    pesan1 = "Berat Volume Tanah Basah
Lapis 1="
    pesan2 = "Berat Volume Tanah Basah
Lapis 2="
    pesan3 = "Berat Volume Tanah Basah
Lapis 3="
    pesan4 = "Berat Volume Tanah Basah
Lapis 4="
    pesan5 = "Berat Volume Tanah Basah
Lapis 5="
    Gb1 = InputBox(pesan1, "Gamma
Basah")
    Gb2 = InputBox(pesan2, "Gamma
Basah")
    Gb3 = InputBox(pesan3, "Gamma
Basah")
    Gb4 = InputBox(pesan4, "Gamma
Basah")
    Gb5 = InputBox(pesan5, "Gamma Basah")
    xx = 0
Loop
MDIForm1.StatusBar1.Panels("koko").Text =
"Proses Optimasi ....."
End Sub
Sub Parameter()
On Error Resume Next
    Q = Q.Text
    T1 = T1.Text
    gpas = gpas.Text
    Phi1 = Text1.Text
    Ch1 = Text2.Text
    H1 = Text3.Text
    Delta1 = Text4.Text
    Phi2 = Text5.Text
    Ch2 = Text6.Text
    H2 = Text7.Text
    Delta2 = Text8.Text
    Phi3 = Text9.Text
    Ch3 = Text10.Text
    H3 = Text11.Text
    Delta3 = Text12.Text
    Phi4 = Text13.Text
    Ch4 = Text14.Text
    H4 = Text15.Text
    Delta4 = Text16.Text
    Phi5 = Text17.Text
    Ch5 = Text18.Text
    H5 = Text19.Text
    Delta5 = Text20.Text
    Hwt = Hwt.Text
    alfa = (Atn(T1 / D)) * (180 * (7 / 22))
    lamda = (180 - (90 + alfa))
    L = (A + B + C + D + E)
    Lt = ((T1 ^ 2) + (D ^ 2)) ^ (0.5)
    Ht = T1 + T2
    L1 = (H1 / (Cos(lamda / (180 * 7 / 22))))
    L2 = (H2 / (Cos(lamda / (180 * 7 / 22))))
    L3 = (H3 / (Cos(lamda / (180 * 7 / 22))))
    L4 = (H4 / (Cos(lamda / (180 * 7 / 22))))
    L5 = (H5 / (Cos(lamda / (180 * 7 / 22))))
    DM1 = ((H1 * D) / T1)
    DM2 = (H2 * D) / T1
    DM3 = (H3 * D) / T1
    DM4 = (H4 * D) / T1
    Ka1 = ((Sin((alfa + Phi1) / (180 * 7 / 22))) ^
    ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
    (Sin((alfa - Delta1) / (180 * 7 / 22))) * (1 +
    (((Sin((Phi1 + Delta1) / (180 * 7 / 22))) *
    (Sin(Phi1 / (180 * 7 / 22)))) / ((Sin((alfa -
    Delta1) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
    22)))))) ^ 0.5)) ^ 2)
    Ka2 = ((Sin((alfa + Phi2) / (180 * 7 / 22))) ^
    ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
    (Sin((alfa - Delta2) / (180 * 7 / 22))) * (1 +
    (((Sin((Phi2 + Delta2) / (180 * 7 / 22))) *
    (Sin(Phi2 / (180 * 7 / 22)))) / ((Sin((alfa -
    Delta2) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
    22)))))) ^ 0.5)) ^ 2)
    Ka3 = ((Sin((alfa + Phi3) / (180 * 7 / 22))) ^
    ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
    (Sin((alfa - Delta3) / (180 * 7 / 22))) * (1 +
    (((Sin((Phi3 + Delta3) / (180 * 7 / 22))) *
    (Sin(Phi3 / (180 * 7 / 22)))) / ((Sin((alfa -
    Delta3) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
    22)))))) ^ 0.5)) ^ 2)
    Ka4 = ((Sin((alfa + Phi4) / (180 * 7 / 22))) ^
    ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
    (Sin((alfa - Delta4) / (180 * 7 / 22))) * (1 +
    (((Sin((Phi4 + Delta4) / (180 * 7 / 22))) *
    (Sin(Phi4 / (180 * 7 / 22)))) / ((Sin((alfa -
    Delta4) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
    22)))))) ^ 0.5)) ^ 2)
    Ka5 = ((Sin((alfa + Phi5) / (180 * 7 / 22))) ^
    ^ 2) / (((((Sin(alfa / (180 * 7 / 22))) ^ 2) *
    (Sin((alfa - Delta5) / (180 * 7 / 22))) * (1 +
    (((Sin((Phi5 + Delta5) / (180 * 7 / 22))) *
    (Sin(Phi5 / (180 * 7 / 22)))) / ((Sin((alfa -
    Delta5) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7 /
    22)))))) ^ 0.5)) ^ 2)

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```

Kp = ((Sin((alfa - Phi5) / (180 * 7 / 22))) ^  

2) / (((Sin(alfa / (180 * 7 / 22))) ^ 2) *  

(Sin((alfa + Delta5) / (180 * 7 / 22)))) * (1 -  

(((Sin((Phi5 + Delta5) / (180 * 7 / 22))) *  

(Sin(Phi5 / (180 * 7 / 22))) / ((Sin((alfa +  

Delta5) / (180 * 7 / 22))) * (Sin(alfa / (180 * 7  

/ 22)))))) ^ 0.5)) ^ 2)
End Sub

```

Data diskrit

```

Dim Linna As Integer
Dim Felix As Integer
Public AA(8), BB(8), CC(8), DD(8), EE(8),
TT2(8)
Sub DimensiA()
AA(0) = Poptimasi.Text6.Text
AA(1) = Poptimasi.Text7.Text
AA(2) = Poptimasi.Text8.Text
AA(3) = Poptimasi.Text9.Text
AA(4) = Poptimasi.Text10.Text
AA(5) = Poptimasi.Text11.Text
AA(6) = Poptimasi.Text12.Text
AA(7) = Poptimasi.Text13.Text
End Sub
Sub DimensiB()
BB(0) = Poptimasi.Text14.Text
BB(1) = Poptimasi.Text15.Text
BB(2) = Poptimasi.Text16.Text
BB(3) = Poptimasi.Text17.Text
BB(4) = Poptimasi.Text18.Text
BB(5) = Poptimasi.Text19.Text
BB(6) = Poptimasi.Text20.Text
BB(7) = Poptimasi.Text21.Text
End Sub
Sub DimensiC()
CC(0) = Poptimasi.Text22.Text
CC(1) = Poptimasi.Text23.Text
CC(2) = Poptimasi.Text24.Text
CC(3) = Poptimasi.Text25.Text
CC(4) = Poptimasi.Text26.Text
CC(5) = Poptimasi.Text27.Text
CC(6) = Poptimasi.Text28.Text
CC(7) = Poptimasi.Text29.Text
End Sub
Sub DimensiD()
DD(0) = Poptimasi.Text30.Text
DD(1) = Poptimasi.Text31.Text
DD(2) = Poptimasi.Text32.Text
DD(3) = Poptimasi.Text33.Text
DD(4) = Poptimasi.Text34.Text
DD(5) = Poptimasi.Text35.Text
DD(6) = Poptimasi.Text36.Text
DD(7) = Poptimasi.Text37.Text
End Sub

```

```

Sub DimensiE()
EE(0) = Poptimasi.Text38.Text
EE(1) = Poptimasi.Text39.Text
EE(2) = Poptimasi.Text40.Text
EE(3) = Poptimasi.Text41.Text
EE(4) = Poptimasi.Text42.Text
EE(5) = Poptimasi.Text43.Text
EE(6) = Poptimasi.Text44.Text
EE(7) = Poptimasi.Text45.Text
End Sub
Sub DimensiT2()
TT2(0) = Poptimasi.Text46.Text
TT2(1) = Poptimasi.Text47.Text
TT2(2) = Poptimasi.Text48.Text
TT2(3) = Poptimasi.Text49.Text
TT2(4) = Poptimasi.Text50.Text
TT2(5) = Poptimasi.Text51.Text
TT2(6) = Poptimasi.Text52.Text
TT2(7) = Poptimasi.Text53.Text
End Sub
Sub kontrol()
MDIForm1.Toolbar1.Buttons(1).Enabled =
False
MDIForm1.Toolbar1.Buttons(2).Enabled =
False
MDIForm1.Toolbar1.Buttons(3).Enabled =
False
MDIForm1.Toolbar1.Buttons(4).Enabled =
False
MDIForm1.Toolbar1.Buttons(5).Enabled =
False
End Sub

```