Súlytámfal méretezés:

$\gamma_b := 22 \cdot \frac{kN}{m^3}$ $\quad i := 1 .. 17$ $\quad be_i := READ("\mathbf{FOLDNYOM.dat}")$

$c := be_2 \cdot Pa$ $\quad c = \mathbf{10}\,kPa$

$a := \frac{c}{2}$ $\quad a = \mathbf{5}\,kPa$

$\phi := be_3$ $\quad \phi = \mathbf{30}\,deg$

$\delta := be_4$ $\quad \delta = \mathbf{20}\,deg$

$H := be_5 \cdot m$ $\quad H = \mathbf{4.5}\,m$

$E_{aF} := be_6 \cdot \frac{N}{m}$ $\quad E_{aF} = \mathbf{0}\,\frac{kN}{m}$

$E_{aq} := be_7 \cdot \frac{N}{m}$ $\quad E_{aq} = \mathbf{13.379}\,\frac{kN}{m}$

$E_{a\gamma} := be_8 \cdot \frac{N}{m}$ $\quad E_{a\gamma} = \mathbf{54.185}\,\frac{kN}{m}$

$E_a := be_9 \cdot \frac{N}{m}$ $\quad E_a = \mathbf{67.565}\,\frac{kN}{m}$

$h_{aF} := be_{10} \cdot m$ $\quad h_{aF} = \mathbf{2.742}\,m$

$h_{aq} := be_{11} \cdot m$ $\quad h_{aq} = \mathbf{2.25}\,m$

$h_{a\gamma} := be_{12} \cdot m$ $\quad h_{a\gamma} = \mathbf{1.5}\,m$

$h_a := be_{17} \cdot m$ $\quad h_a = \mathbf{1.649}\,m$

$k_{aF} := be_{13} \cdot m$ $\quad k_{aF} = \mathbf{2.577}\,m$

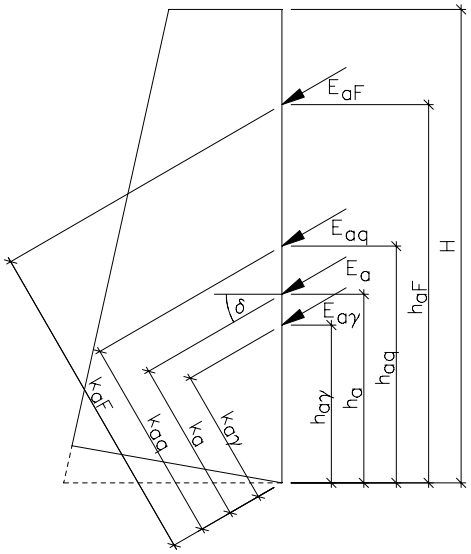
$k_{aq} := be_{14} \cdot m$ $\quad k_{aq} = \mathbf{2.114}\,m$

$k_{a\gamma} := be_{15} \cdot m$ $\quad k_{a\gamma} = \mathbf{1.41}\,m$

$k_a := be_{16} \cdot m$ $\quad k_a = \mathbf{1.549}\,m$

$E_{av} := E_a \cdot \sin(\delta)$ $\quad E_{av} = \mathbf{23.108}\,\frac{kN}{m}$

$E_{ah} := E_a \cdot \cos(\delta)$ $\quad E_{ah} = \mathbf{63.49}\,\frac{kN}{m}$



Támfal szélesség meghatározása:

$\mu := 20 \cdot deg$ $\quad \rho(A,B) := \frac{H}{B - A}$

$b(A,B) := \frac{B \cdot \sin(\operatorname{atan}(\rho(A,B)))}{\sin(180 \cdot deg - \operatorname{atan}(\rho(A,B)) - \mu)}$

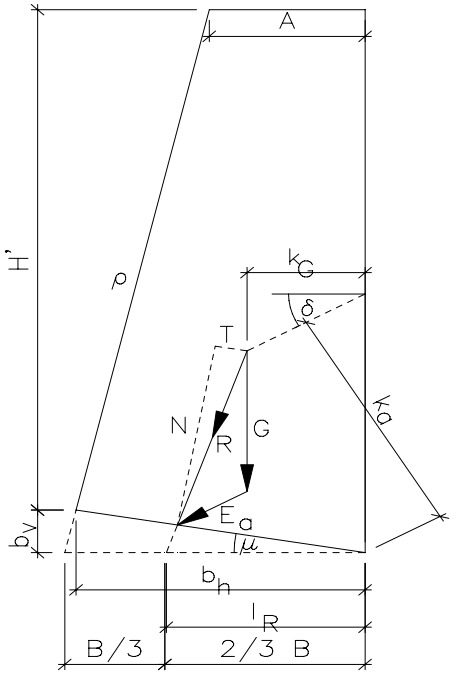
$b_v(A,B) := b(A,B) \cdot \sin(\mu)$

$b_h(A,B) := b(A,B) \cdot \cos(\mu)$

$H'(A,B) := H - b_v(A,B)$

$G(A,B) := \left(\frac{B + A}{2} \cdot H - \frac{B \cdot b(A,B) \cdot \sin(\mu)}{2}\right) \cdot \gamma_b$

$N(A,B) := G(A,B) + E_{av}$



$$k_G(A,B) := \frac{\left[\frac{A^2\cdot H'(A,B)}{2} + \frac{H'(A,B)\cdot(B-A)}{2}\cdot\left(A+\frac{B-A}{3}\right) + \frac{b_h(A,B)^2\cdot b_v(A,B)}{6}\right]\cdot\gamma_b}{G(A,B)}$$

$$l_R(A,B) := \frac{E_a\cdot k_a + G(A,B)\cdot k_G(A,B)}{N(A,B)} \qquad \rho := \frac{3}{1}$$

$$B := \text{root}\left(l_R\left(B-\frac{H}{\rho},B\right) - \frac{2}{3}\cdot B, B\right) \qquad B = 2.105\,\text{m}$$

$$A := B - \frac{H}{\rho} \qquad A = 0.605\,\text{m}$$

$$\frac{B}{3} = 0.702\,\text{m} \quad < \quad l_R(A,B) = 1.403\,\text{m} \quad =< \quad \frac{2}{3}\cdot B = 1.403\,\text{m}$$

Alkalmazott méretek:

$$B := 2.15\cdot\text{m} \qquad B - \frac{H}{\rho} = 0.65\,\text{m} \qquad A := 0.6\cdot\text{m}$$

$$k_G(A,B) = 0.809\,\text{m} \qquad G(A,B) = 119.68\,\frac{\text{kN}}{\text{m}} \qquad N(A,B) = 142.788\,\frac{\text{kN}}{\text{m}}$$

$$\frac{B}{3} = 0.717\,\text{m} \quad < \quad l_R(A,B) = 1.411\,\text{m} \quad =< \quad \frac{2}{3}\cdot B = 1.433\,\text{m}$$

$$\alpha_\gamma := 1.5 \qquad \alpha_q := 1.25 \qquad \alpha_G := 0.9 \qquad \alpha_{súrl} := \frac{2}{3}$$

Elcsúszás vizsgálat:

Esetleges talajcsere miatt: $\mu_{súrl} := \tan(\delta)$ $\mu_{súrl} = 0.364$

$$E_{aFT} := E_{aF}\cdot\cos(\delta+\mu) \qquad E_{aFT} = 0\,\frac{\text{kN}}{\text{m}}$$

$$E_{aqT} := E_{aq}\cdot\cos(\delta+\mu) \qquad E_{aqT} = 10.249\,\frac{\text{kN}}{\text{m}}$$

$$E_{agT} := E_{a\gamma}\cdot\cos(\delta+\mu) \qquad E_{agT} = 41.508\,\frac{\text{kN}}{\text{m}}$$

$$E_{aFN} := E_{aF}\cdot\sin(\delta+\mu) \qquad E_{aFN} = 0\,\frac{\text{kN}}{\text{m}}$$

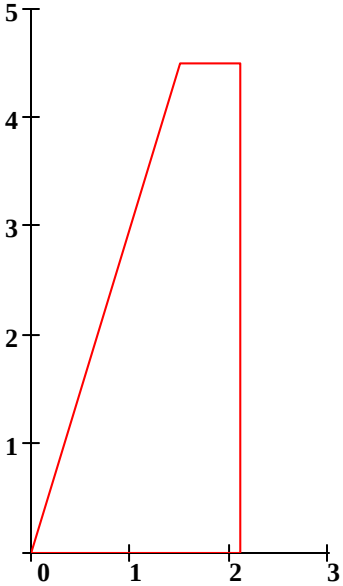
$$E_{aqN} := E_{aq}\cdot\sin(\delta+\mu) \qquad E_{aqN} = 8.6\,\frac{\text{kN}}{\text{m}}$$

$$E_{agN} := E_{a\gamma}\cdot\sin(\delta+\mu) \qquad E_{agN} = 34.83\,\frac{\text{kN}}{\text{m}}$$

$$\frac{\left[\alpha_G\cdot G(A,B)\cdot\cos(\mu) + \left(E_{aFN}+E_{aqN}+E_{agN}\right)\right]\cdot\alpha_{súrl}\cdot\mu_{súrl} \ldots}{\alpha_\gamma\cdot E_{agT} + \alpha_q\cdot\left(E_{aqT}+E_{aFT}\right)} = 1.094$$

$$\ldots + \alpha_G\cdot G(A,B)\cdot\sin(\mu) + a\cdot b(A,B)$$

Táfal keresztmetszet



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Megfelel!!!

Kiborulás vizsgálat: $k_G(A,B) = \mathbf{0.809}\,m$ $0.9\cdot B - k_G(A,B) = \mathbf{1.126}\,m$

$$k := 0.9\cdot B\cdot\left(\sin(\delta) + \frac{\sin(\mu)\cdot\sin(\delta+\mu)}{\sin(180\cdot deg - \mu - \operatorname{atan}(\rho(A,B)))}\right)$$

$k = \mathbf{1.087}\,m$

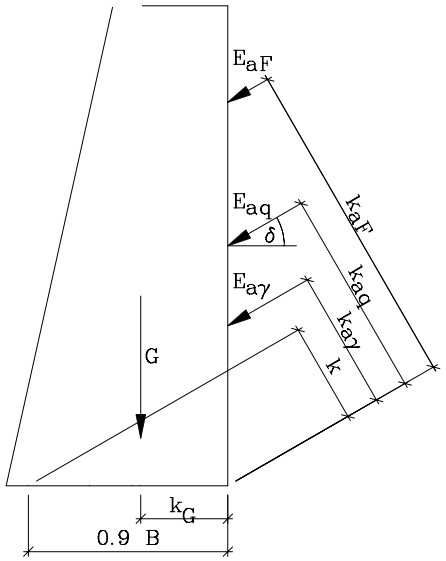
$l_{aF} := k_{aF} - k$ $l_{aF} = \mathbf{1.49}\,m$

$l_{aq} := k_{aq} - k$ $l_{aq} = \mathbf{1.027}\,m$

$l_{a\gamma} := k_{a\gamma} - k$ $l_{a\gamma} = \mathbf{0.322}\,m$

$$\frac{\alpha_G\cdot G(A,B)\cdot\left(0.9\cdot B - k_G(A,B)\right)}{\alpha_\gamma\cdot E_{a\gamma}\cdot l_{a\gamma} + \alpha_q\cdot\left(E_{aq}\cdot l_{aq} + E_{aF}\cdot l_{aF}\right)} = \mathbf{2.797} \quad > \mathbf{1}$$

Megfelel!!!



Talpfeszültségek számítása:

$n(A,B) := E_{aFN} + E_{aqN} + E_{agN} + G(A,B)\cdot\cos(\mu)$

$$e := \frac{E_a\cdot k_a + G(A,B)\cdot k_G(A,B)}{n(A,B)} - \frac{b(A,B)}{2}$$ $e = \mathbf{0.276}\,m$ =< $\frac{B}{6} = \mathbf{0.358}\,m$

$$\sigma_1 := \frac{n(A,B)}{b(A,B)}\cdot\left(1 + \frac{6\cdot e}{b(A,B)}\right)$$ $\sigma_1 = \mathbf{139.097}\,kPa$

$$\sigma_2 := \frac{n(A,B)}{b(A,B)}\cdot\left(1 - \frac{6\cdot e}{b(A,B)}\right)$$ $\sigma_2 = \mathbf{14.257}\,kPa$

Támfal alatti talpsíkra merőleges fesz.