1: Determinacion del coeficiente de empuje activo K_A

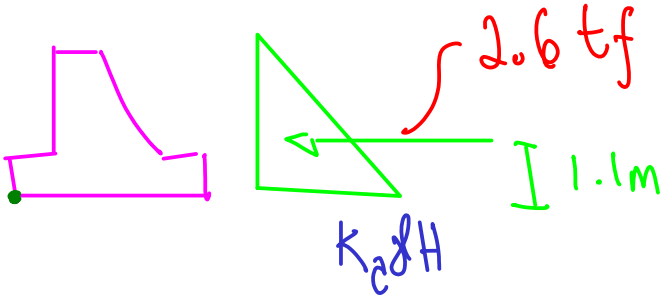
$$K_A = \frac{1-\text{sen}\phi}{1+\text{sen}\phi} = \frac{1-\text{sen}35}{1+\text{sen}35} = 0.271$$

Empuje Activo

$$E_A = \frac{1}{2} K_a \gamma H^2 = \frac{1}{2}(0.271)\left(1.762 \frac{tf}{m^3}\right)(3.3m)^2$$

$$= 2.6 \text{ tonnef}$$

Localizacion de E_A

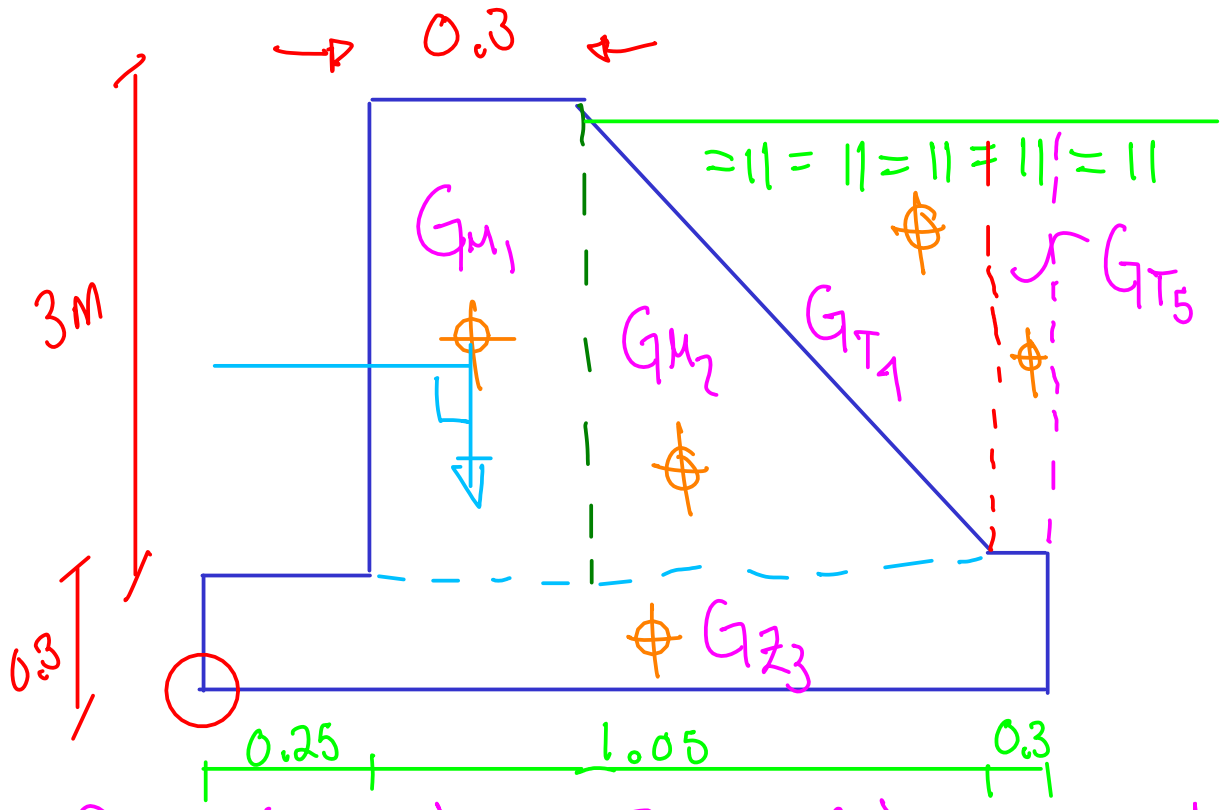


2: Momento de volteo

$$M_e = (2.6)(1.1) = 2.86 \text{ tfm}$$

3: Momento resistente

M_i



	Peso (tonnef)	Brazo (m)	Momento
$G_{M_1} = (3)(0.3)(2.32) = 2.088$		$0.25 + \frac{0.3}{2} = 0.4$	0.8352
$G_{M_2} = \frac{1}{2}(0.75)(3)(2.32) = 2.61$		$0.25 + 0.3 + \frac{1}{3}(0.75) = 0.8$	2.088
$G_{Z_3} = (1.6)(0.3)(2.32) = 1.11$		$1.6/2 = 0.8$	0.89
$G_{T_1} = \frac{1}{2}(0.75)(3)(1.762) = 1.98$		$0.25 + 0.3 + \frac{2}{3}(0.75) = 1.05$	2.08
$G_{T_5} = (0.3)(3)(1.762) = 1.58$		$0.25 + 1.05 + 0.3/2 = 1.45$	2.299
	9.38		8.19

4.- Factor de seguridad contra el volteo

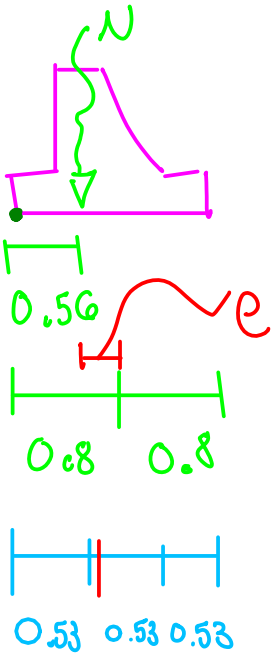
$$\frac{M_i}{M_e} = \frac{8.19}{2.86} = 2.87 > 2 \quad \therefore \text{OK}$$

5.- Factor de seguridad contra el deslizamiento

$$F_{fr} = \mu N = 0.5(9.38) = 4.69 \text{ tonnef}$$

$$\frac{F_{fr}}{E_A} = \frac{4.69}{2.6} = 1.8 > 1.5 \therefore \text{OK}$$

6.- Presiones en el suelo

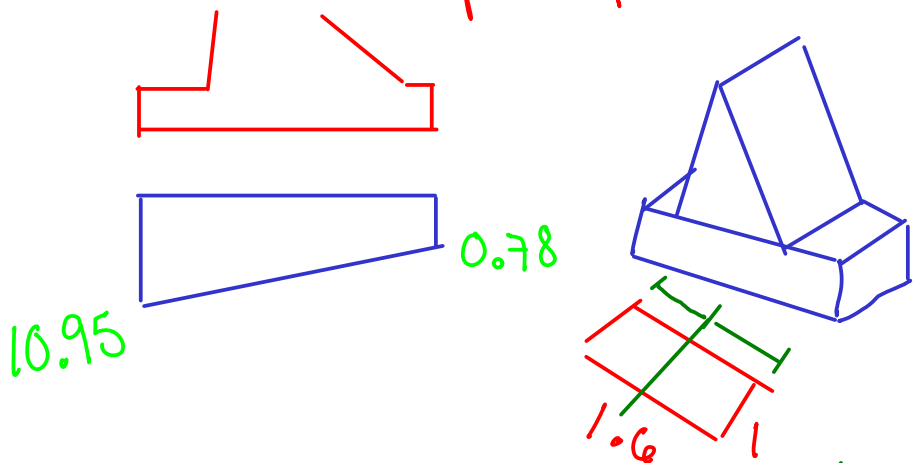


$$x = \frac{M_i - M_e}{N} = \frac{8.19 - 2.86}{9.38} = 0.56$$

$$e = \frac{b}{2} - x = \frac{1.6}{2} - 0.56 = 0.23$$

$$\frac{1.6}{3} = 0.53$$

$\therefore$ La resultante pasa por el tercio medio



$$M = N \cdot e$$

$$\sigma_1 = \frac{P}{A} + \frac{Mc}{I} = \frac{9.38}{(1.6)(1)} + \frac{(9.38)(0.23)(1.6/2)}{\frac{1}{12}(1)(1.6)^3} = 10.95 \text{ tf/m}^2$$

$$\sigma_2 = \frac{P}{A} - \frac{Mc}{I} = 0.78 \ tf/m^2$$

$q = 12.21 > 10.95 \therefore$ El suelo admite la presion.

$$\frac{12.21}{10.95} = 1.11$$ Fact. Seg. Aplastamiento

7.- Revision deflexion en el concreto.