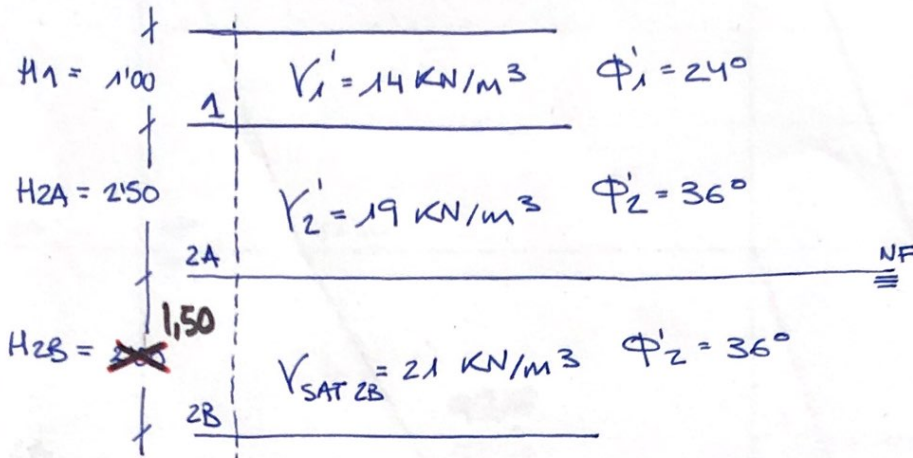


EXAMEN 2

2.1.



① TENSIONES VERTICALES

$$\sigma_{v1} = \gamma_1' \cdot H_1 = 14 \text{ KN/m}^3 \cdot 1'00 \text{ m} = \underline{14 \text{ KN/m}^2}$$

$$\tau_{v1} = \sigma_{v1} = \underline{14 \text{ KN/m}^2}$$

$$\sigma_{v2A} = \sigma_{v1} + \gamma_2' \cdot H_{2A} = 14 \text{ KN/m}^2 + 19 \text{ KN/m}^3 \cdot 2'50 \text{ m}$$

$$\tau_{v2A} = 14 \text{ KN/m}^2 + 47'50 \text{ KN/m}^2 = \underline{61'50 \text{ KN/m}^2}$$

$$\sigma'_{v2A} = \sigma_{v2A} = \underline{61'50 \text{ KN/m}^2}$$

$$\sigma_{v2B} = \sigma_{v2A} + \gamma_{\text{SAT } 2B} \cdot H_{2B} = 61'50 \text{ KN/m}^2 + 21 \text{ KN/m}^3 \cdot \cancel{2'50 \text{ m}}^{1'50 \text{ m}}$$

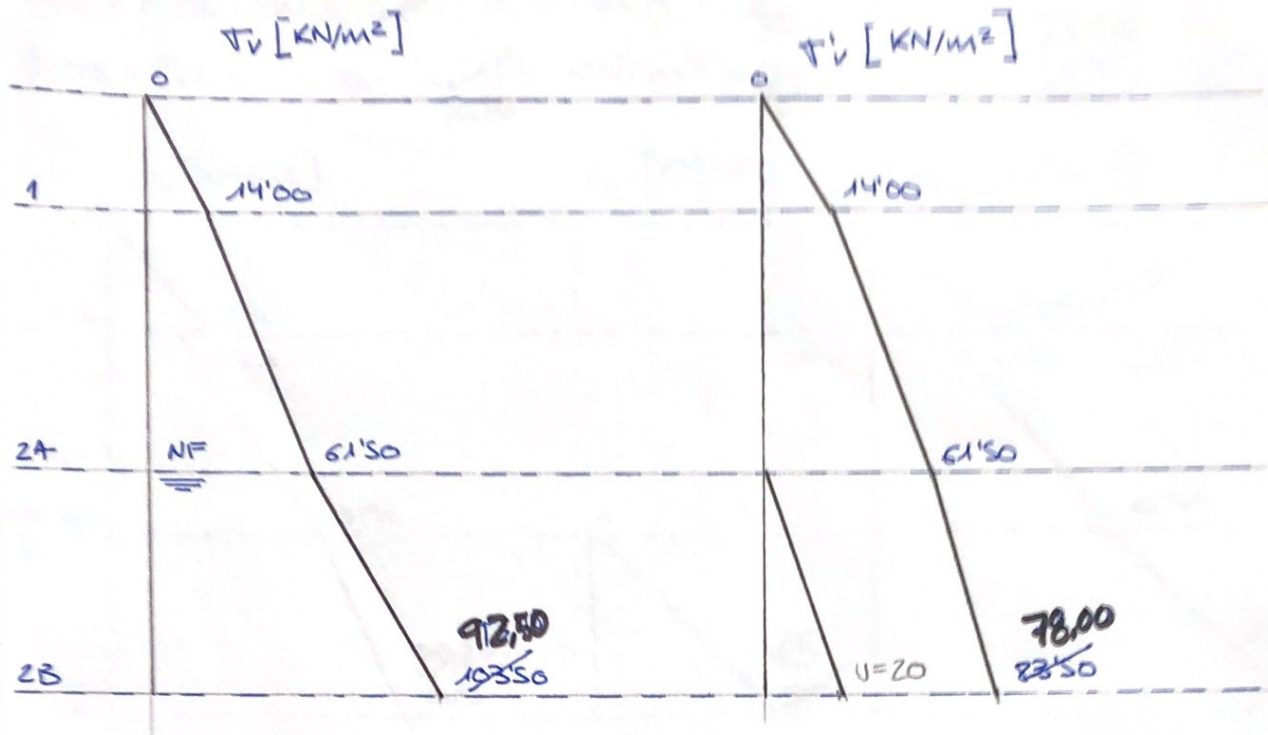
$$\tau_{v2B} = 61 \text{ KN/m}^2 + \cancel{42}^{31'50} \text{ KN/m}^2 = \underline{92'50 \text{ KN/m}^2}$$

$$\sigma' = \sigma_{v2B} + (\gamma_{\text{SAT } 2B} - \gamma_w) \cdot H_{2B}$$

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② CÁLCULO DE EMPUJES

$$K_{A1} = \frac{1 - \operatorname{sen} \phi'_1}{1 + \operatorname{sen} \phi'_1}$$

$$\operatorname{sen} \phi'_1 = \operatorname{sen} 24^\circ = 0'407$$

$$K_{A1} = \frac{1 - 0'407}{1 + 0'407} = \underline{\underline{0'421}}$$

$$K_{A2} = \frac{1 - \operatorname{sen} \phi'_2}{1 + \operatorname{sen} \phi'_2}$$

$$\operatorname{sen} \phi'_2 = \operatorname{sen} 36^\circ = 0'588$$

$$K_{A2} = \frac{1 - 0'588}{1 + 0'588} = \underline{\underline{0'259}}$$

$$E_1 = 14 \text{ KN/m}^2 \cdot 0'421 = 5'89 \text{ KN/m}^2$$

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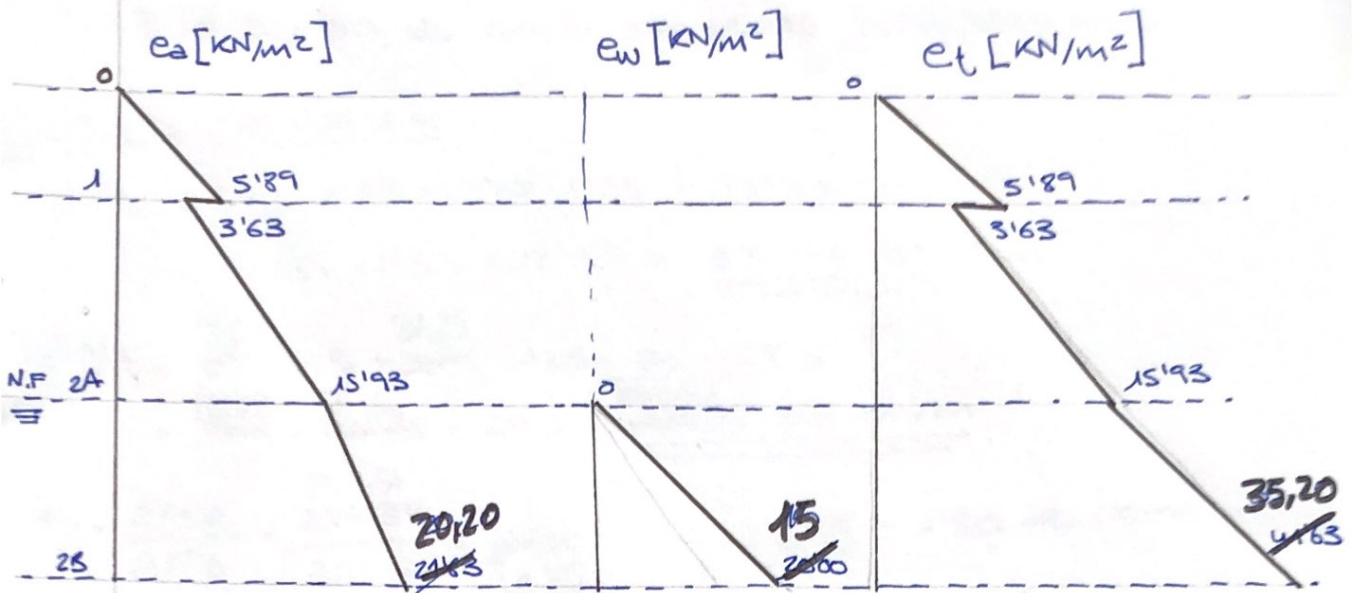
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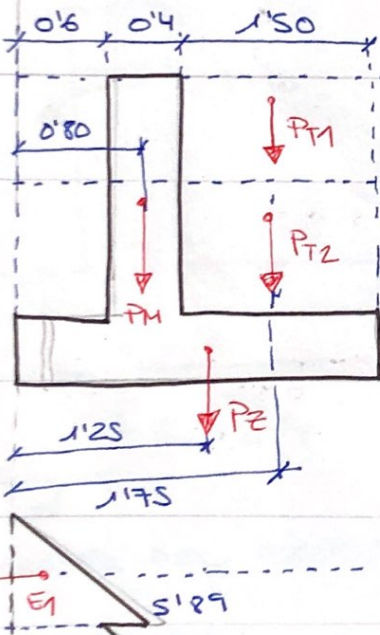
$$U_{ZB} = H_{ZB} \cdot \gamma_w = \frac{1,50}{2,00} \cdot 10 \text{ KN/m}^3 = \frac{20,20}{15} \text{ KN/m}^2$$

2.3

$$e_{TZB} = e_{ZB} + U_{ZB} = \frac{2,163}{20,20} \text{ KN/m}^2 + \frac{7,0}{15} \text{ KN/m}^2 = \frac{35,20}{41,63} \text{ KN/m}^2$$



③ CÁLCULO ESTABILIDAD MUROS



$$P_T = P_{T1} + P_{T2}$$

$$P_T = (1,50 \cdot 1,00) \cdot 14 + (1,50 \cdot 2,00) \cdot 19$$

$$P_T = \frac{84}{78} \text{ KN/m}$$

$$P_z = 0,50 \cdot 2,50 \cdot 25 = \frac{31,25}{31,25} \text{ KN/m}$$

$$P_M = 0,40 \times 3,00 \times 25 = \frac{30,00}{30,00} \text{ KN/m}$$

$$\Sigma P_V = P_T + P_M + P_z$$

$$\Sigma P_V = \frac{78}{78} + \frac{31,25}{31,25} + \frac{30,00}{30,00} = \frac{139,25}{139,25} \text{ KN/m}$$

$$E_1 = 5,89 \cdot \frac{1}{2} \cdot 1 = \frac{2,95}{2,95} \text{ KN/m}$$

$$E_{2AR} = 3,63 \cdot 2,50 = \frac{9,08}{9,08} \text{ KN/m}$$

$$E_{2I} = 15,93 \cdot 2,50 = \frac{39,83}{39,83} \text{ KN/m}$$

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$$F_D = \frac{\sum F_v \cdot t_g d'}{\sum E F_H} = \frac{139,25}{27,41} = \boxed{2,26}$$

$F_D = 2,26 \geq 1,50 \Rightarrow$ CUMPLE SEGURIDAD DESLIZAMIENTO

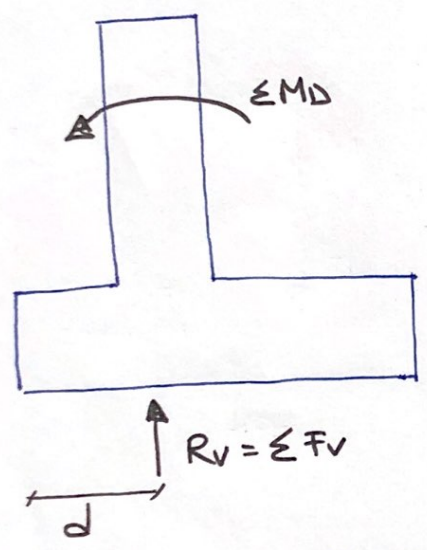
CÁLCULO DE VUELCO

$$\sum M_D = 2,95 \cdot 2,83 + 9,08 \cdot 1,25 + 15,38 \cdot 0,83 = 8,35 + 11,35 + 12,77 = \underline{\underline{32,47 \text{ KN}\cdot\text{M}/\text{m}}}$$

$$\sum M_E = 78 \cdot 1,75 + 31,25 \cdot 1,25 + 30 \cdot 0,8 = 136,50 + 39,06 + 24 = \underline{\underline{199,56 \text{ KN}\cdot\text{M}/\text{m}}}$$

$$F_V = \frac{\sum M_E}{\sum M_D} = \frac{199,56}{32,47} = \boxed{6,15}$$

$$F_V = 6,15 \geq 1,50 \Rightarrow \text{NO HAY VUELCO}$$



$$R_v \cdot d + M_D = M_E$$

$$d = \frac{M_E - M_D}{R_v} = \frac{199,56 - 32,47}{15,50} = \frac{167,09}{15,50} = 1,20 \text{ m}$$

$$d = 1,20 \text{ m} \rightarrow e = 1,20 - 1,223 = \underline{\underline{e = 0,027 \text{ m}}}$$

$$e = 0,05 \text{ m}$$

TENSIONES DEL TERRENO

$$\sigma = \frac{R_v}{B} \left(1 \pm \frac{6e}{B} \right) = \frac{15,50}{1,20} \left(1 \pm \frac{6 \cdot 0,027}{1,20} \right) = 12,92 \left(1 \pm 0,135 \right)$$



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