

SPINTA - 0210

DIREZIONE  $\sigma$ : \_\_\_\_\_

VERSO: \_\_\_\_\_  $\rightarrow$

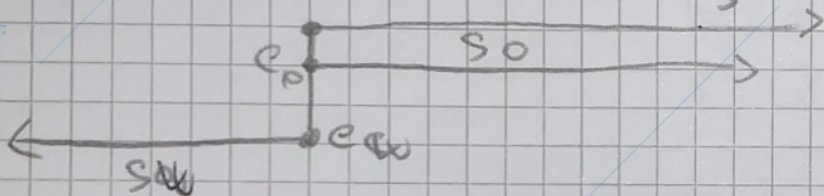
$$F' = P_a \cdot \Sigma$$

$$P_a = P_A + \gamma \cdot \frac{AB}{2} = \frac{23575}{m^2 \cdot 10^2} \cdot \frac{6m}{2} = 22072,5 \Rightarrow 22 \text{ kPa}$$

$$\Sigma_1 = 6m \cdot 1m = 6m^2$$

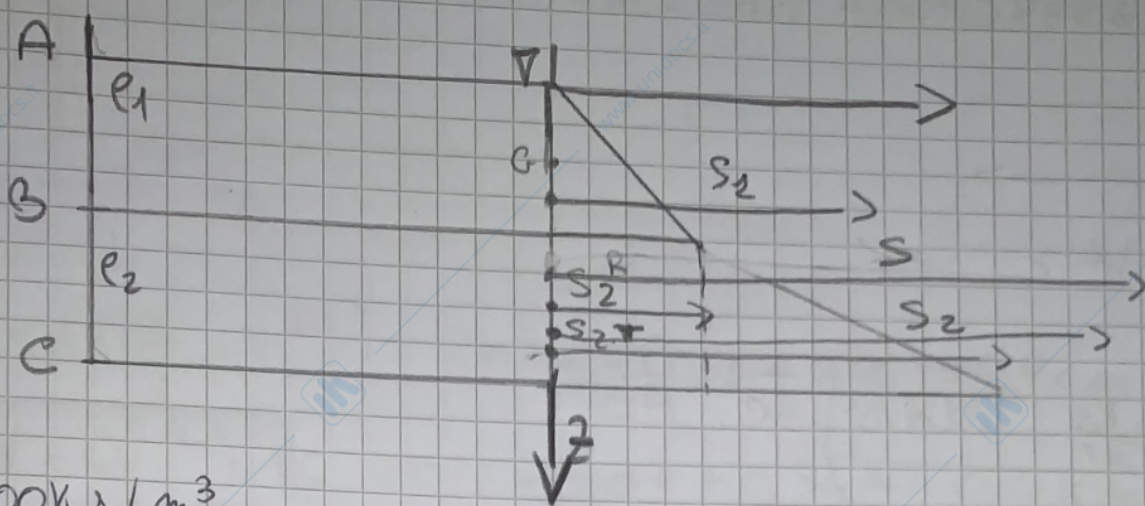
$$S = 22 \text{ kPa} \cdot 6m^2 = 132 \text{ kN}$$

CENTRO D'APPLICAZIONE  $\sigma$



$$d = 3 - 1,5 = 1,5m$$

$$cc0 = \frac{S_w}{S_0 - S_w} \cdot d = \frac{44kN}{132kN - 44kN} \cdot 1,5m = 0,75m$$



$$\rho_1 = 700 \text{ kg/m}^3$$

$$\rho_2 = 1000 \text{ kg/m}^3$$

$$\overline{AC} = \overline{AB} + \overline{BC} = 1 \text{ m} + 1,06 = 2,06 \text{ m}$$

$$P_c = 17,2 \text{ kPa}$$

$$\overline{AB} = 1 \text{ m}$$

$$P_B = P_A + \gamma \cdot \overline{AB}$$

$$P_B = 0 + \frac{700 \text{ kg}}{\text{m}^3} \cdot 9,81 \text{ m/s}^2 \cdot 1 \text{ m} = 6867 \text{ KPa} \rightarrow 6,8 \text{ kPa}$$

$$P_c = P_B + \gamma \cdot \overline{BC}$$

$$\overline{BC} = \frac{P_c - P_B}{\gamma} = \frac{17,2 \text{ kPa} - 6,8 \text{ kPa}}{\frac{1000 \text{ kg}}{\text{m}^3} \cdot 9,81 \text{ m/s}^2} = \frac{10,4 \text{ kPa}}{\frac{9810 \text{ kg}}{\text{m}^2 \cdot \text{s}^2}} = 1,06 \text{ m}$$

SPINTA DEL LIQUIDO  $\perp$

DIREZIONE:  $\longrightarrow$

VERSO:  $\longrightarrow$

$$F = P_a \cdot S$$

$$P_a = P_{a0} + \gamma \cdot \frac{\overline{AB}}{2} = 3433 \text{ KPa} \Rightarrow 3,43 \text{ kPa}$$

$$S = \overline{AB} \cdot \overline{AC} = 1 \text{ m} \cdot 2,06 \text{ m} = 2,06 \text{ m}^2$$

$$F = 3,43 \text{ kPa} \cdot 2,06 \text{ m}^2 = 7,1 \text{ kN}$$

# SPINTA ESERCITATA DAL LIQUIDO 2

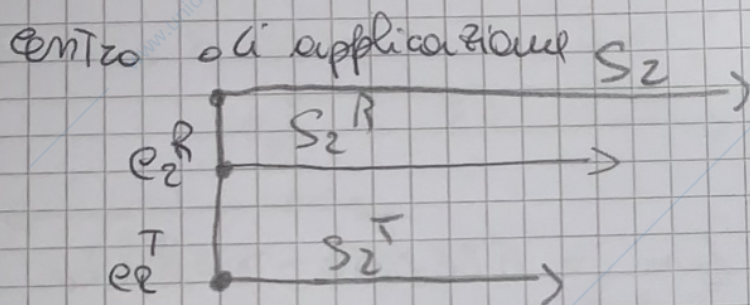
Direzione: \_\_\_\_\_

Verso: \_\_\_\_\_ →

$$S = \frac{\gamma}{2} \cdot h^2 \cdot L$$

$$S = \left( \frac{1000 \frac{\text{kg}}{\text{m}^3} \cdot 9,81 \text{ m/s}^2}{2} \right) \cdot \overline{BC}^2 \cdot \overline{AC}$$

$$S = 11316 \text{ N} \Rightarrow 11,3 \text{ kN}$$



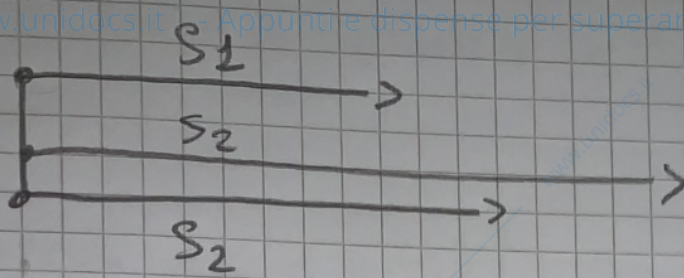
$$S_2^R = \overline{AC} \cdot \overline{BC} \cdot \rho_B = \overline{AC} \cdot \overline{BC} \cdot \gamma \cdot \overline{AB} =$$

$$S_2^R = 14,42 \text{ kN}$$

$$S_2^T = \overline{AC} \cdot \frac{\overline{BC}}{2} \cdot \gamma_2 \overline{BC} = 10,51 \text{ kN}$$

$$e_{C_2}^R = \frac{S_2^T}{S_2^T + S_2^R} \cdot d = \frac{10,51 \text{ kN}}{10,51 \text{ kN} + 14,42 \text{ kN}} \cdot 0,17 \text{ m} = 0,07 \text{ m}$$

$$d = \overline{BC} - \left( \frac{\overline{BC}}{2} + \frac{\overline{BC}}{3} \right) = 0,17 \text{ m}$$

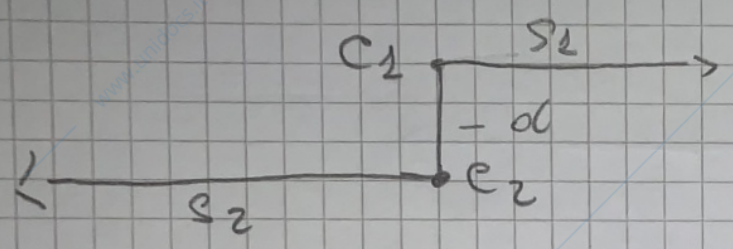


$$d_1 = AC - \left( \frac{2AB}{3} + C_2^{(F)} \right) = 2,02 \text{ m} - (0,66 + 0,44) = 0,92 \text{ m}$$

$$e_2^{R(F)} = (d - C C_2^R) + \frac{BC}{3} = 0,17 \cdot 0,07 + 0,34 \text{ m} = 0,44 \text{ m}$$

$$PC_2 = \frac{S_1}{S_2 + S_1} \cdot d_1 = \frac{7,1 \text{ kN}}{24,93 \text{ kN} + 7,1 \text{ kN}} \cdot 0,92 \text{ m} = 0,20 \text{ m}$$

### CENTRO DI APPLICAZIONE DELLA SPINTA

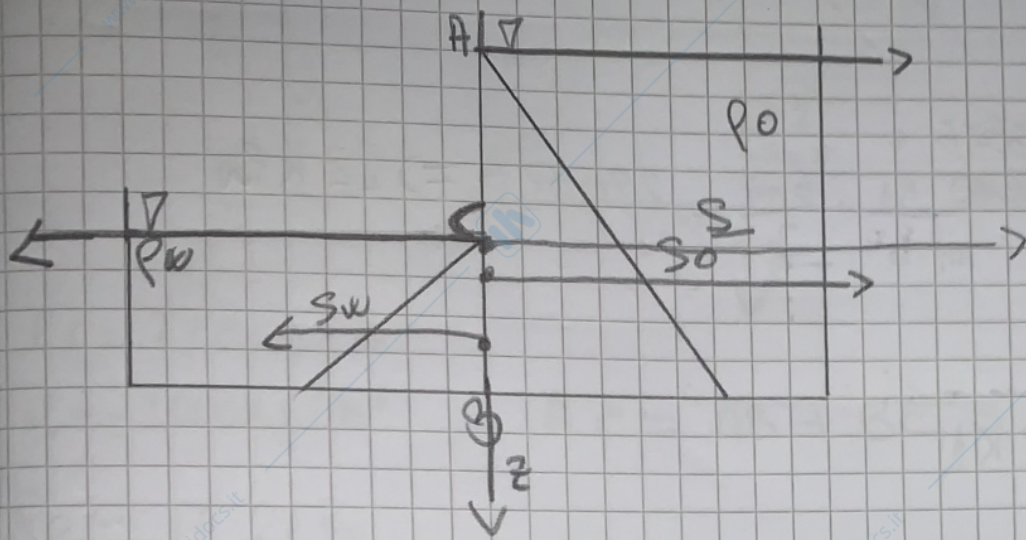


$$e_{C2} = \frac{S1}{S2 - S1} \cdot d = \frac{1200}{1412 - 1200} \cdot \frac{AB}{6} = 11 \text{ m}$$

$$e_F = \frac{AB}{3} + e_{C2} = 4 + 11 = 15 \text{ m}$$

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$L = 6\text{ m}$        $\rho_w = 1000\text{ kg/m}^3$        $S_w = ?$   
 $AB = 6\text{ m}$        $\rho_0 = 7500\text{ kg/m}^3$        $S_0 = ?$   
 $BC = 3\text{ m}$

SPINTA DELLA COLONNA

DIREZIONE :

Verso : ←

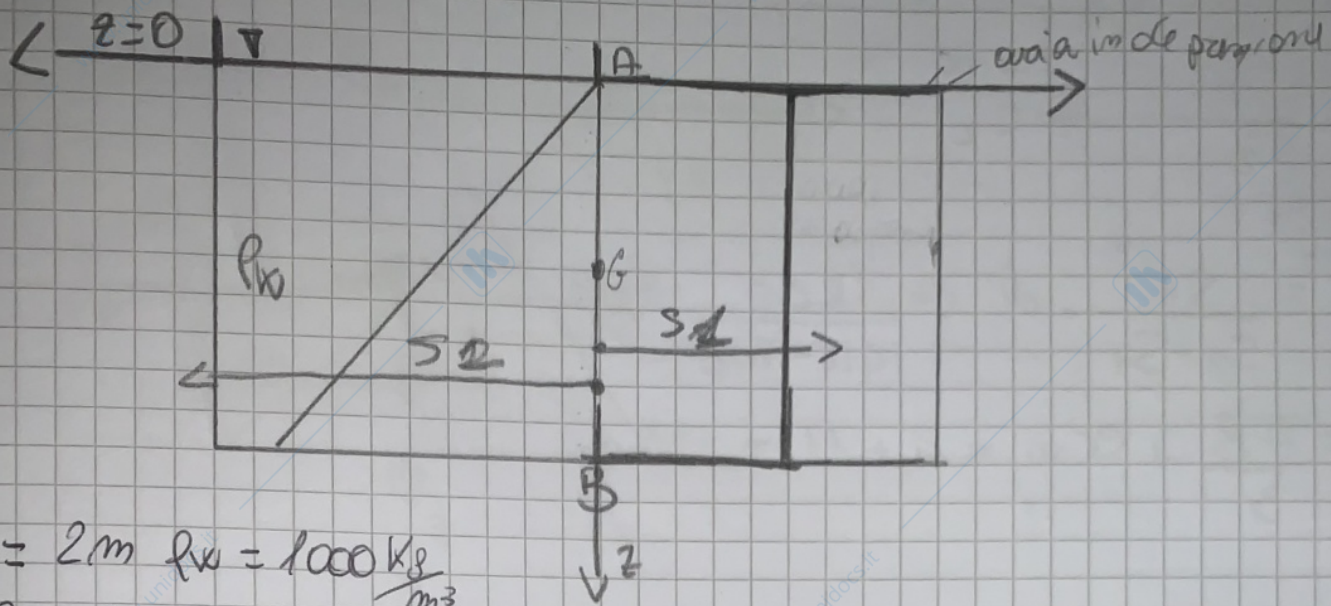
$$F = p_0 \cdot \Sigma$$

$$\begin{aligned}
 p_0 &= p_c + \gamma \cdot \frac{eB}{2} = 0 + \frac{10000\text{ kg}}{\text{m}^3} \cdot 9,81\text{ m/s}^2 \cdot \frac{3\text{ m}}{2} \\
 &= \frac{9810\text{ kg}}{\text{m}^2 \cdot \text{s}^2} \cdot 1,5\text{ m} = 14715 \Rightarrow 14,71\text{ kPa}
 \end{aligned}$$

$$\Sigma = 3\text{ m} \cdot 1\text{ m} = 3\text{ m}^2$$

$$F = 14,71\text{ kPa} \cdot 3\text{ m}^2 = 44\text{ kN}$$

# IDROSTATICA



$$L = 2 \text{ m} \quad \rho_w = 1000 \frac{\text{kg}}{\text{m}^3}$$

$$AB = 12 \text{ m}$$

$$P_{\text{acqua}} = -50 \text{ kPa}$$

SPINTA ESERCITATA DALL'ACQUA

DIREZIONE: \_\_\_\_\_

VERSO:  $\leftarrow$

$$\text{MODULO: } F = P_G \cdot \Sigma$$

$$P_G = P_A + \gamma \frac{AB}{2} = 0 + 1000 \frac{\text{kg}}{\text{m}^3} \cdot \frac{12 \text{ m}}{2} = 58860 \text{ Pa} \Rightarrow 58,86 \text{ kPa}$$

$$\Sigma = 2 \text{ m} \cdot 12 \text{ m} = 24 \text{ m}^2$$

$$F = 58860 \cdot 24 = 1412640 \text{ N} \rightarrow 1412 \text{ kN}$$

SPINTA LATO DELL'ARIA

DIREZIONE: \_\_\_\_\_

VERSO:  $\rightarrow$

$$F = |P_{\text{accia}}| \cdot \Sigma = 50 \text{ kPa} \cdot 24 \text{ m}^2 = 1200 \text{ kN}$$