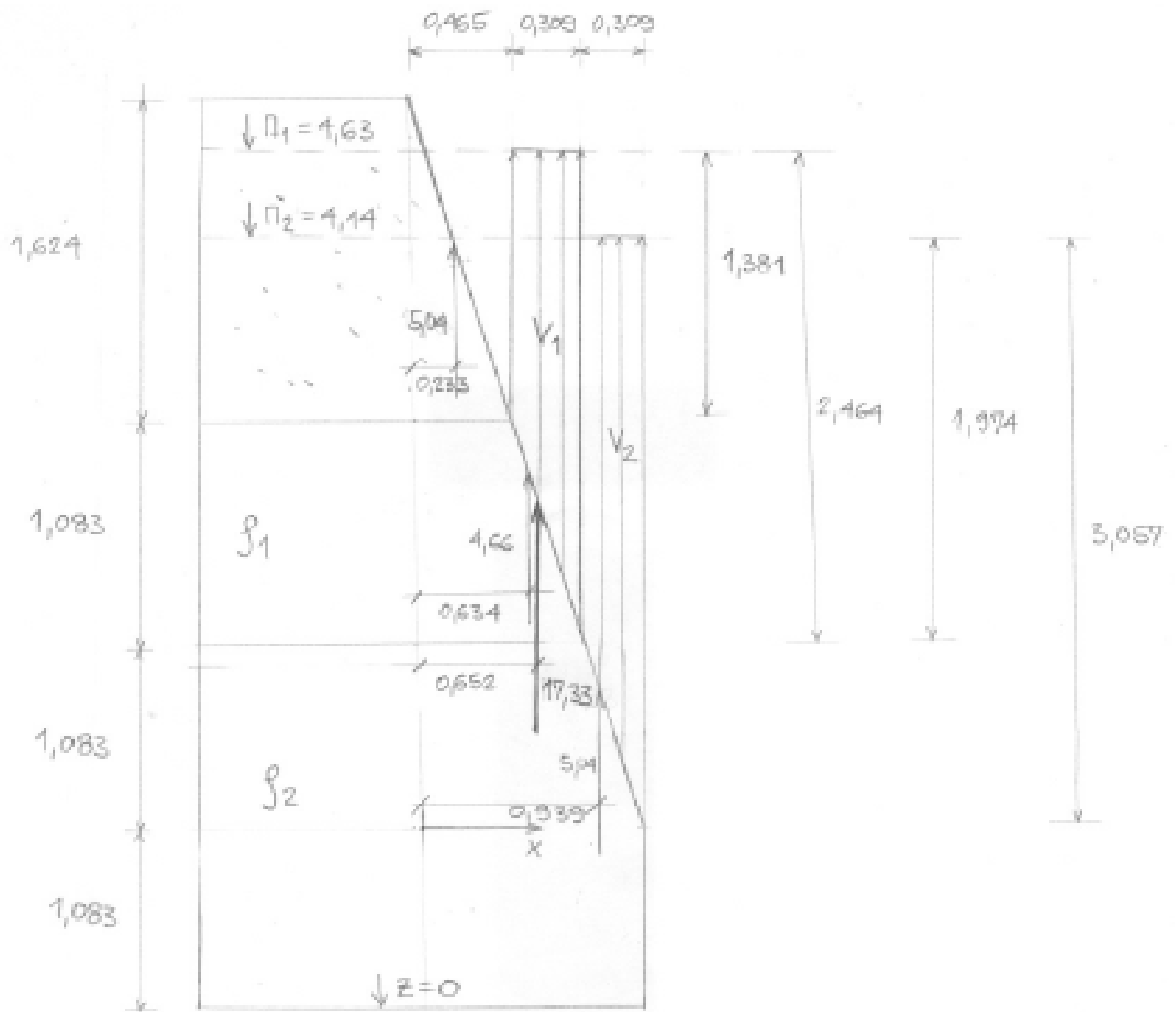


a)



$$V_1 = \frac{1,381 + 2,464}{2} \cdot 0,309 = 0,594 \text{ m}^3$$

$$P_{z1} = \rho_f \cdot g \cdot V_1 = 0,8 \cdot 9,81 \cdot 0,594 = 4,66 \text{ kN}$$

$$x_1 = 0,465 + \frac{0,309}{2} \cdot 0,309 \cdot 1,381 + \frac{2}{3} \cdot 0,309 \cdot \frac{1}{2} \cdot 0,309 \cdot 1,083}{0,594} = 0,634 \text{ m}$$

$$V_2 = \frac{1,974 + 3,057}{2} \cdot 0,309 = 0,799 \text{ m}^3$$

$$P_{z2} = \rho_s \cdot g \cdot V_2 = 1 \cdot 9,81 \cdot 0,799 = 7,63 \text{ kN}$$

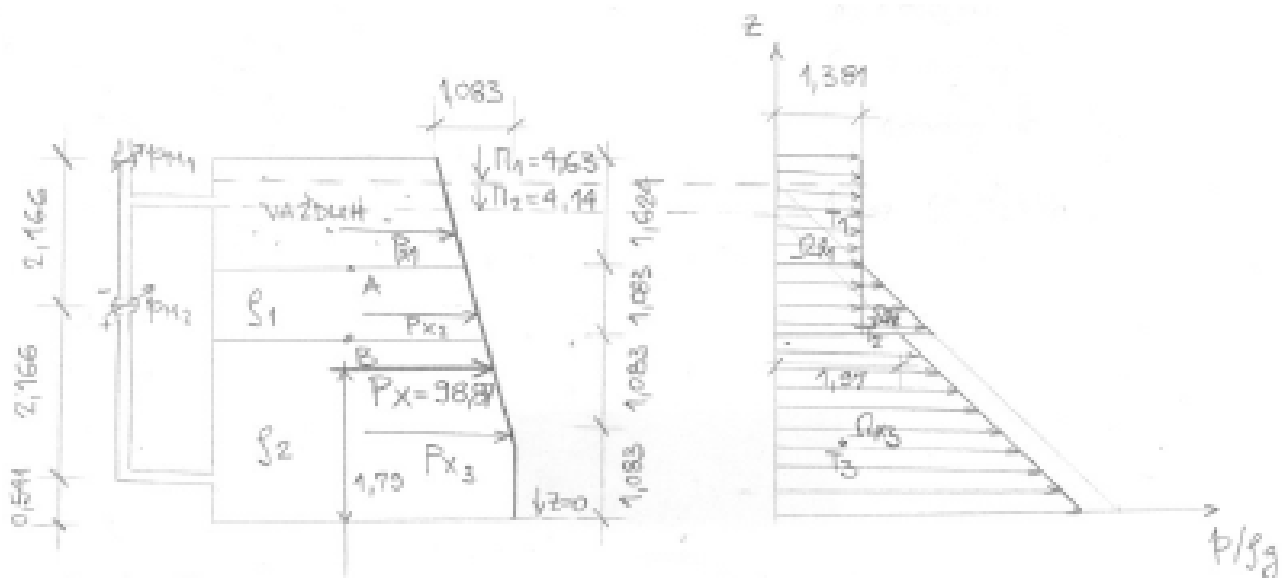
$$x_2 = 0,974 + \frac{\frac{1}{2} \cdot 0,309 \cdot 0,309 \cdot 1,974 + \frac{2}{3} \cdot 0,309 \cdot \frac{1}{2} \cdot 0,309 \cdot 1,083}{0,799} = 0,939 \text{ m}$$

$$P_{z3} = p_{ua2} \cdot A_{ua2} = 10,83 \cdot 0,465 = 5,04 \text{ kN}$$

$$x_3 = 0,233 \text{ m}$$

$$P_z = P_{z1} + P_{z2} + P_{zua2} = 4,66 + 7,63 + 5,04 = 17,33 \text{ kN}$$

$$x = \frac{4,66 \cdot 0,634 + 7,63 \cdot 0,939 + 5,04 \cdot 0,233}{17,33} = 0,652 \text{ m}$$



$$a = 1,083 \text{ m}$$

$$\rho_1 = 0,8 \text{ kg/dm}^3$$

$$\rho_2 = 1 \text{ kg/dm}^3$$

$$p_{\text{vaz}} = 10,83 \text{ kPa}$$

$$\Pi_1 = z_A + \frac{p_A}{\rho_1 g} = 3,248 + \frac{10,83}{0,8 \cdot 9,81} = 4,63 \text{ m}$$

$$p_B = \rho_1 \cdot g \cdot (\Pi_1 - z_B) = 0,8 \cdot 9,81 \cdot (4,63 - 2,166) = 19,34 \text{ kPa}$$

$$\Pi_2 = z_B + \frac{p_B}{\rho_2 g} = 2,166 + \frac{19,34}{1 \cdot 9,81} = 4,14 \text{ m}$$

$$\Omega_{x_1} = 1,381 \cdot 2,709 = 3,74 \text{ m}^2$$

$$P_{x_1} = \rho_1 \cdot g \cdot \Omega_{x_1} \cdot L = 0,8 \cdot 9,81 \cdot 3,74 \cdot 1 = 29,35 \text{ kN}$$

$$z_1 = 2,166 + 1,354 = 3,52 \text{ m}$$

$$\Omega_{x_2} = \frac{1,083^2}{2} = 0,586 \text{ m}^2$$

$$P_{x_2} = \rho_1 \cdot g \cdot \Omega_{x_2} \cdot L = 0,8 \cdot 9,81 \cdot 0,586 = 4,60 \text{ kN}$$

$$z_2 = 2,166 + \frac{1,083}{3} = 2,53 \text{ m}$$

$$\Omega_{x_3} = \frac{1,97 + 4,14}{2} \cdot 2,166 = 6,62 \text{ m}^2$$

$$P_{x_3} = \rho_2 \cdot g \cdot \Omega_{x_3} \cdot L = 1 \cdot 9,81 \cdot 6,62 = 64,92 \text{ kN}$$

$$z_3 = \frac{1,083 \cdot 1,97 \cdot 2,166 + \frac{1}{3} \cdot 2,166 \cdot \frac{1}{2} \cdot 2,166^2}{6,62} = 0,955 \text{ m}$$

$$P_x = 29,35 + 4,60 + 64,92 = 98,87 \text{ kN}$$

$$z = \frac{29,35 \cdot 3,52 + 4,60 \cdot 2,53 + 64,92 \cdot 0,955}{98,87} = 1,79 \text{ m}$$

$$b) p_{\text{vaz}} = p_{M_1} = 10,83 \text{ kPa}$$

$$p_{M_2} = \rho_2 \cdot g \cdot (\Pi_2 - z_{M_2}) = 1 \cdot 9,81 \cdot (4,14 - 2,709) = 14,06 \text{ kPa}$$

$$\Delta p_{M_2} = p_{M_2} - p_{\text{vaz}} = 14,06 - 10,83 = 3,23 \text{ kPa}$$