

- płyta P<sub>12-0</sub>

$$q_d := 16.7 \cdot \frac{\text{kN}}{\text{m}} \quad l_o := 2.0 \cdot \text{m} \quad h := 0.18 \cdot \text{m} \quad d := h - 0.02 \text{m} \quad d = 16 \text{ cm} \quad b := 1 \cdot \text{m}$$

$$M_{sd} := \frac{q_d \cdot l_o^2}{8} \quad M_{sd} = 8.35 \text{ kN} \cdot \text{m} \quad \alpha := 0.85$$

$$s_{bc} := \frac{M_{sd}}{\alpha \cdot b \cdot d^2 \cdot f_{cd}} \quad s_{bc} = 0.023 \quad \xi := \frac{1 - \sqrt{1 - 2 \cdot s_{bc}}}{0.8} \quad \xi = 0.029 \quad x := \xi \cdot d \quad x = 0.465 \text{ cm}$$

$$A_{s1} := \frac{0.8 \cdot x \cdot b \cdot \alpha \cdot f_{cd}}{f_{yd}} \quad A_{s1} = 1.2572 \text{ cm}^2 \quad \text{- przyjęto } \phi 12 \text{ co } 12 \text{ cm - } A_{s,obl}=9,42 \text{ cm}^2$$

-płyta P<sub>13.0</sub>

$$q_d := 16.7 \cdot \frac{\text{kN}}{\text{m}} \quad h := 0.18 \cdot \text{m} \quad d := h - 0.02 \text{m} \quad d = 16 \text{ cm}$$

$$l_{ox} := 6.00 \cdot \text{m} \quad l_{oy} := 7.225 \cdot \text{m} \quad b := 1 \cdot \text{m} \quad d_y := d - 1.20 \cdot \text{cm} \quad d_y = 14.8 \text{ cm}$$

$$\frac{l_{oy}}{l_{ox}} = 1.204 \quad \phi_{1x} := 0.0514 \quad \phi_{1y} := 0.0248 \quad \chi_1 := 0.675 \quad \alpha := 0.85$$

$$M_{sd,x} := q_d \cdot l_{ox}^2 \cdot \phi_{1x} \quad M_{sd,x} = 30.902 \text{ kN} \cdot \text{m} \quad M_{sd,px} := \frac{-\chi_1}{12} \cdot q_d \cdot l_{ox}^2 \quad M_{sd,px} = -33.818 \text{ kN} \cdot \text{m}$$

$$M_{sd,y} := q_d \cdot l_{oy}^2 \cdot \phi_{1y} \quad M_{sd,y} = 21.619 \text{ kN} \cdot \text{m} \quad M_{sd,py} := -\frac{1 - \chi_1}{12} \cdot q_d \cdot l_{ox}^2 \quad M_{sd,py} = -16.282 \text{ kN} \cdot \text{m}$$

$$s_{bcx} := \frac{M_{sd,x}}{\alpha \cdot b \cdot d^2 \cdot f_{cd}} \quad s_{bcx} = 0.085 \quad \xi := \frac{1 - \sqrt{1 - 2 \cdot s_{bcx}}}{0.8} \quad \xi = 0.111 \quad x := \xi \cdot d \quad x = 1.78 \text{ cm}$$

$$A_{s1x} := \frac{0.8 \cdot x \cdot b \cdot \alpha \cdot f_{cd}}{f_{yd}} \quad A_{s1x} = 4.8126 \text{ cm}^2 \quad \text{- przyjęto } \phi 12 \text{ co } 12 \text{ cm - } A_{s,obl}=9,42 \text{ cm}^2$$

$$s_{bcy} := \frac{M_{sd,y}}{\alpha \cdot b \cdot d_y^2 \cdot f_{cd}} \quad s_{bcy} = 0.07 \quad \xi := \frac{1 - \sqrt{1 - 2 \cdot s_{bcy}}}{0.8} \quad \xi = 0.09 \quad x := \xi \cdot d \quad x = 1.443 \text{ cm}$$

$$A_{s1y} := \frac{0.8 \cdot x \cdot b \cdot \alpha \cdot f_{cd}}{f_{yd}} \quad A_{s1y} = 3.9007 \text{ cm}^2 \quad \text{- przyjęto } \phi 12 \text{ co } 12 \text{ cm - } A_{s,obl}=9,42 \text{ cm}^2$$

-płyta P<sub>14.0</sub>

$$q_d := 16.7 \cdot \frac{\text{kN}}{\text{m}} \quad h := 0.18 \cdot \text{m} \quad d := h - 0.02 \text{m} \quad d = 16 \text{ cm}$$

$$l_{ox} := 4.045 \cdot \text{m} \quad l_{oy} := 7.225 \cdot \text{m} \quad b := 1 \cdot \text{m} \quad d_y := d - 1.20 \cdot \text{cm} \quad d_y = 14.8 \text{ cm}$$

$$\frac{l_{oy}}{l_{ox}} = 1.786 \quad \phi_{1x} := 0.0873 \quad \phi_{1y} := 0.0090 \quad \chi_1 := 0.913 \quad \alpha := 0.85$$