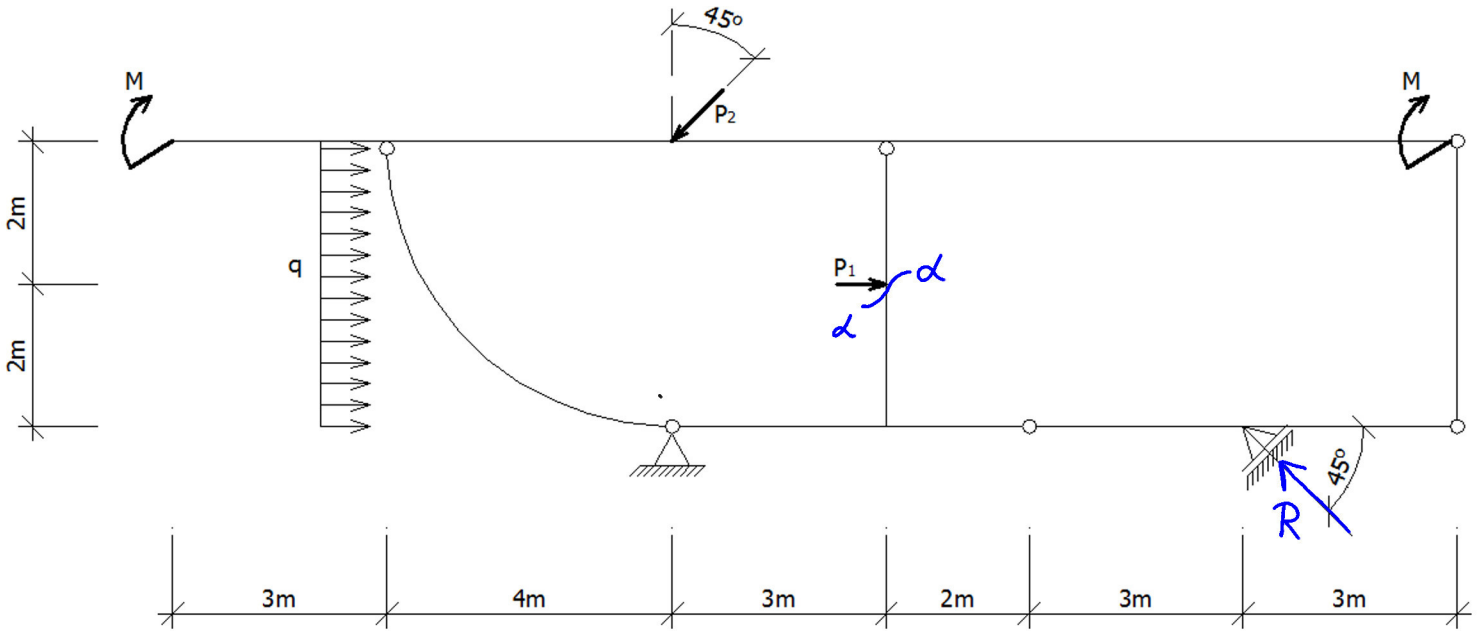
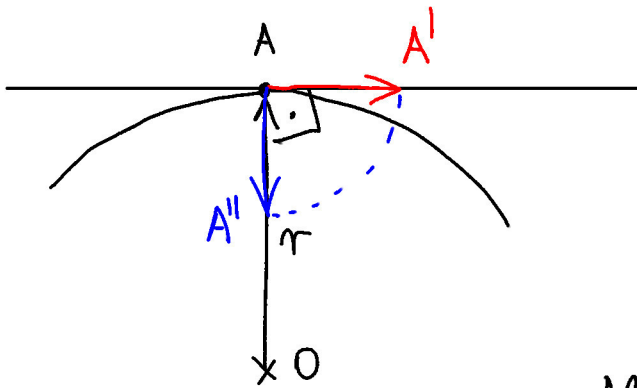


# ZASADA PRAC PRZYGOTOWANYCH - RAMY I KRATOWNICE

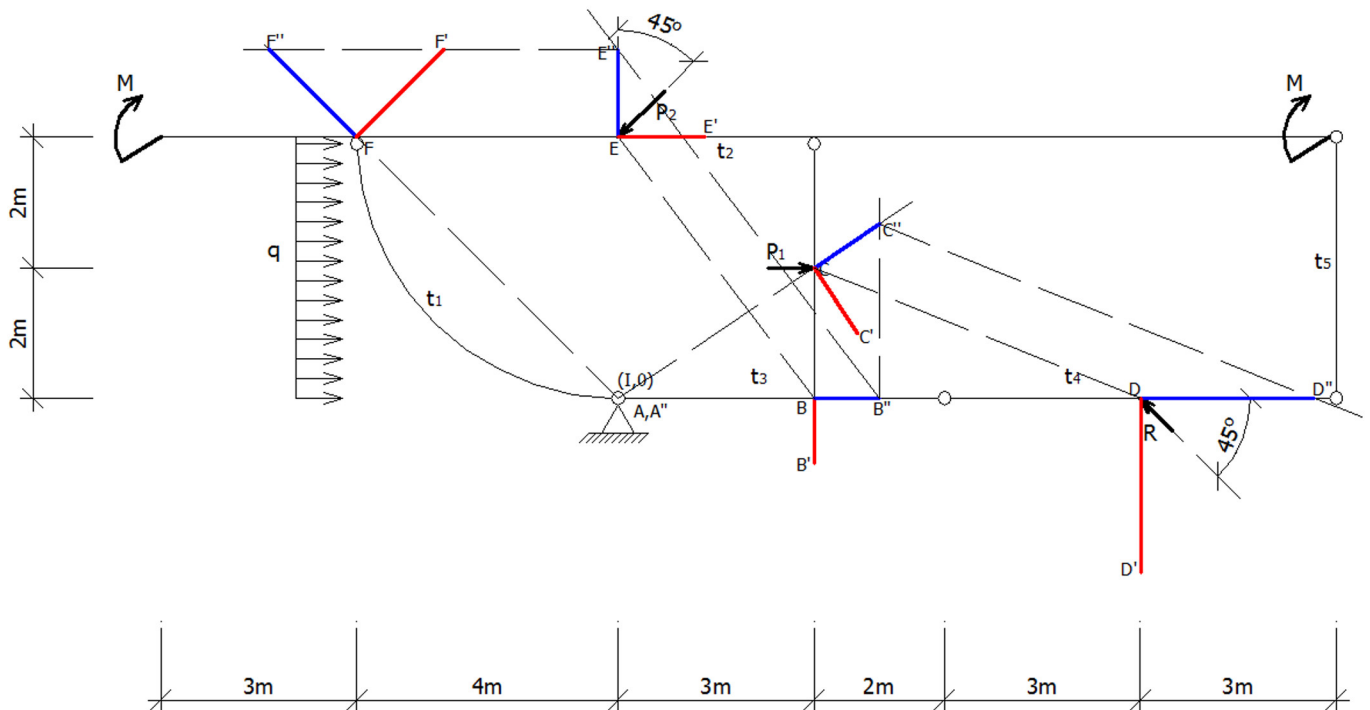


$P_1 = 10 \text{ kN}$  ,  $P_2 = 20 \text{ kN}$  ,  $M = 45 \text{ kNm}$  ,  $q_f = 6 \frac{\text{kN}}{\text{m}}$

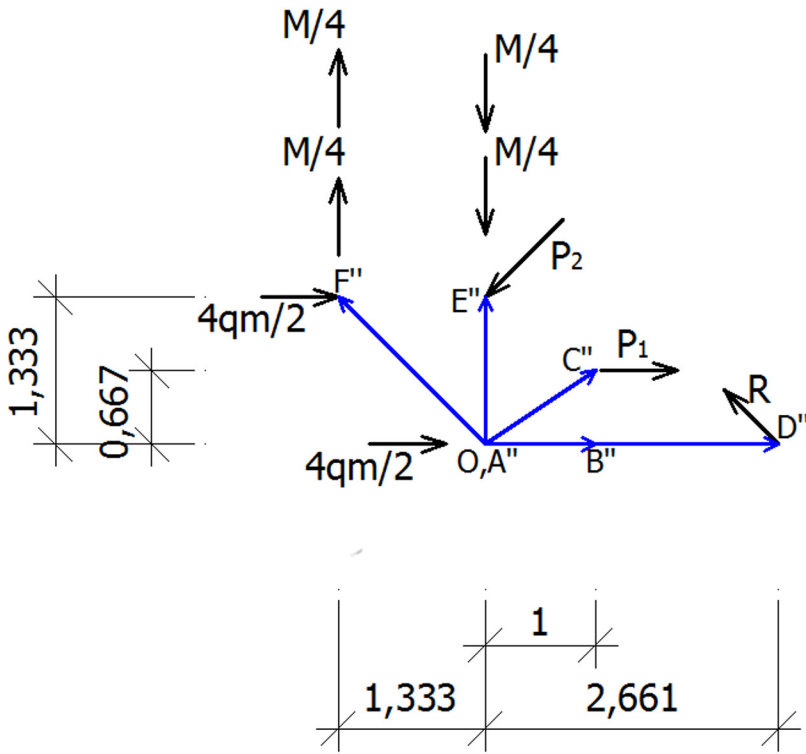


MECHANIZM "R"

PPO



# BPPO



Rotacione prec

$$\sum M_o = 0$$

$$-\frac{\sqrt{2}}{2}R \cdot 2,661 + 10 \cdot 0,667 +$$

$$-\frac{\sqrt{2}}{2} \cdot 20 \cdot 1,333 + \frac{45}{4} \cdot 1,333 +$$

$$+ \frac{45}{4} \cdot 1,333 + \frac{4 \cdot 6}{2} \cdot 1,333 = 0$$

$$R = 17,967 \text{ kN}$$

## 2. MECHANIZM "M<sub>d</sub>"

$$\begin{matrix} 3 \\ 2 \\ 1 \end{matrix} \begin{matrix} 4 \\ 4 \\ 4 \end{matrix} \rightarrow (2,4)$$

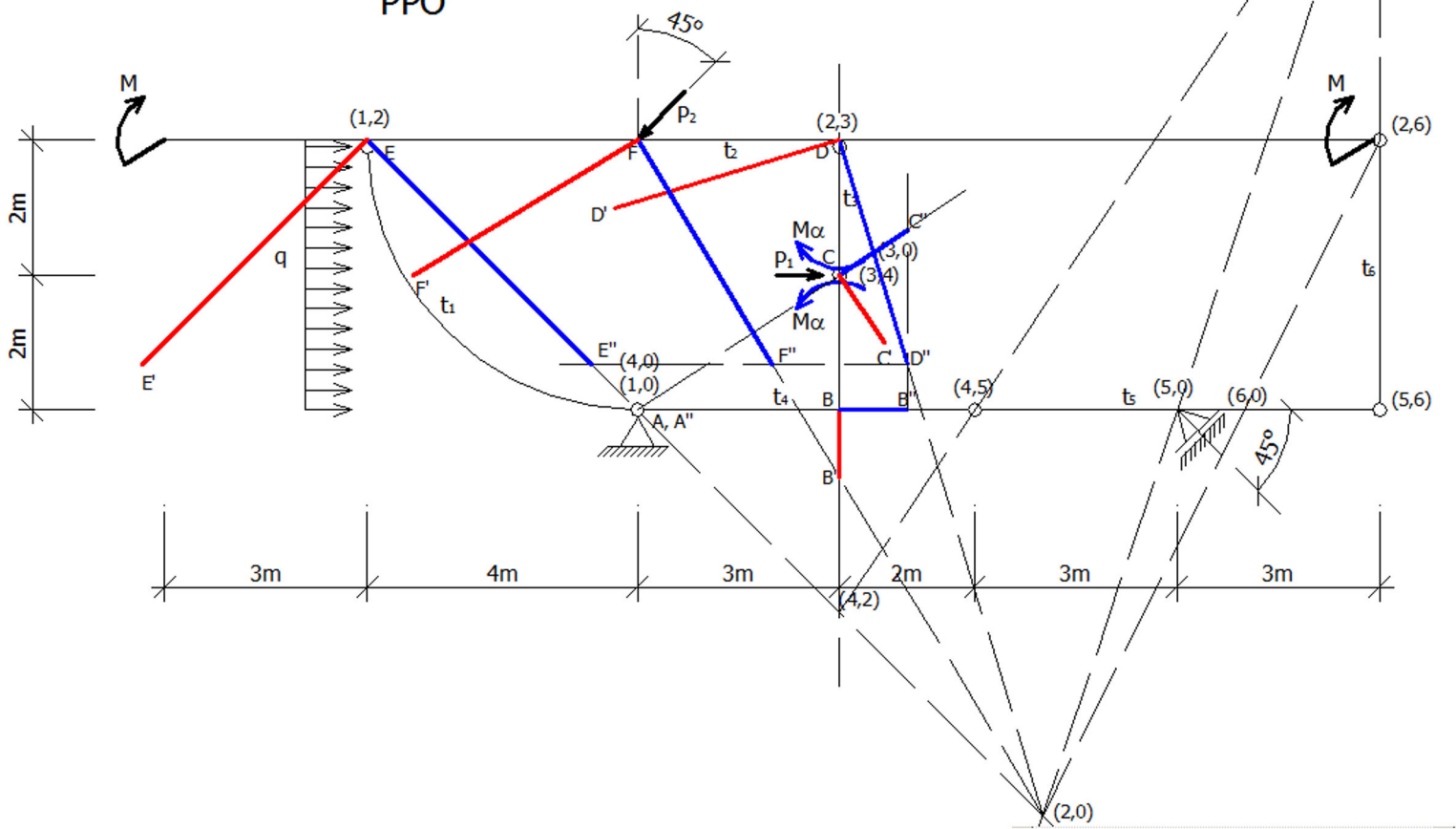
$$\begin{matrix} 4 \\ 2 \\ 6 \end{matrix} \begin{matrix} 5 \\ 5 \\ 5 \end{matrix} \rightarrow (2,5)$$

$$\begin{matrix} 5 \\ 2 \\ 1 \end{matrix} \begin{matrix} 0 \\ 0 \\ 0 \end{matrix} \rightarrow (2,0)$$

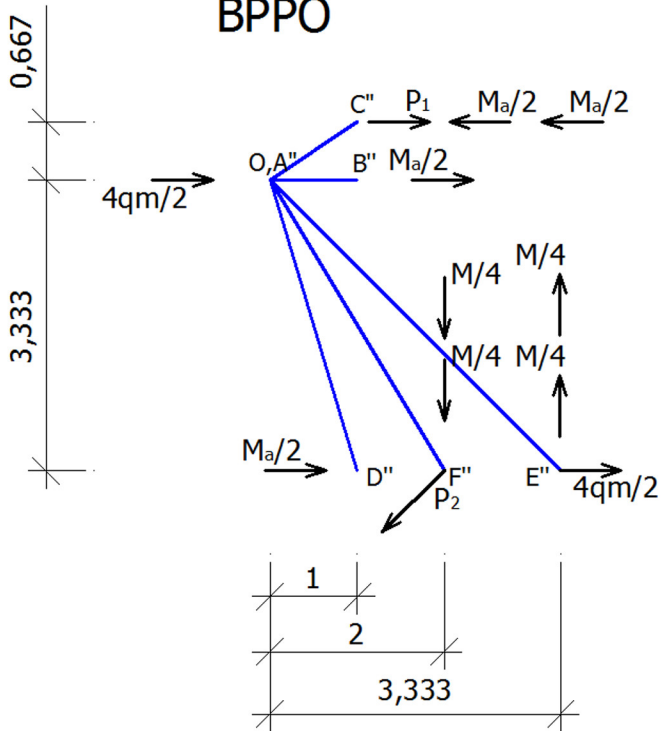
$$\begin{matrix} 5 \\ 4 \\ 4 \end{matrix} \begin{matrix} 0 \\ 0 \\ 0 \end{matrix} \rightarrow (5,0)$$

# MECHANIZM "M<sub>α</sub>"

PPO



BPPO



$$\sum M_o = 0$$

$$10 \cdot 0,667 - M_\alpha \cdot 0,667 - \frac{M_\alpha}{2} \cdot 3,333 +$$

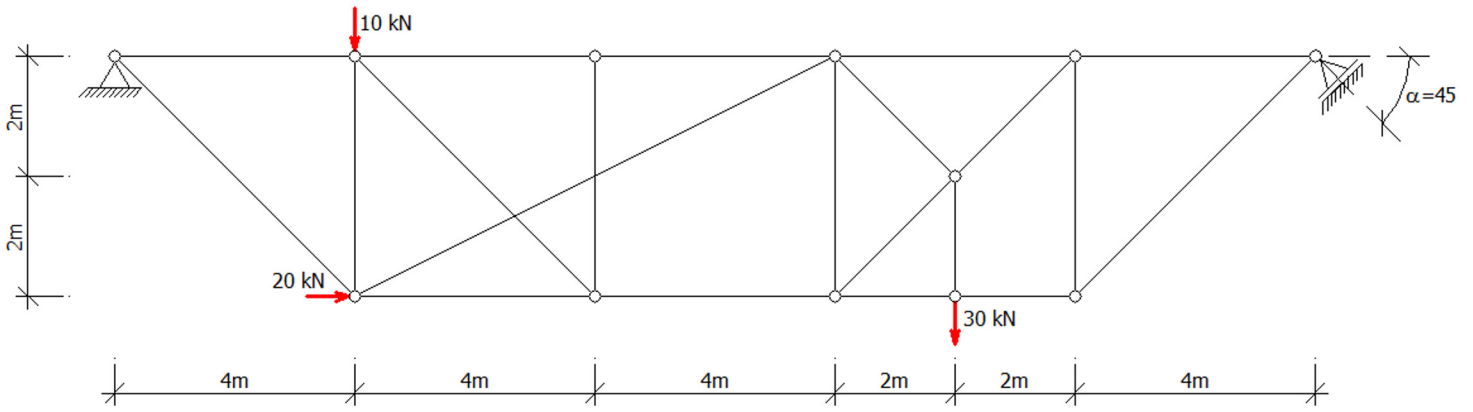
$$+ \frac{45}{4} \cdot 2 + \frac{45}{4} \cdot 2 + \frac{\sqrt{2}}{2} \cdot 20 \cdot 3,333 +$$

$$+ \frac{\sqrt{2}}{2} \cdot 20 \cdot 2 - \frac{45}{4} \cdot 3,333 - \frac{45}{4} \cdot 3,333 +$$

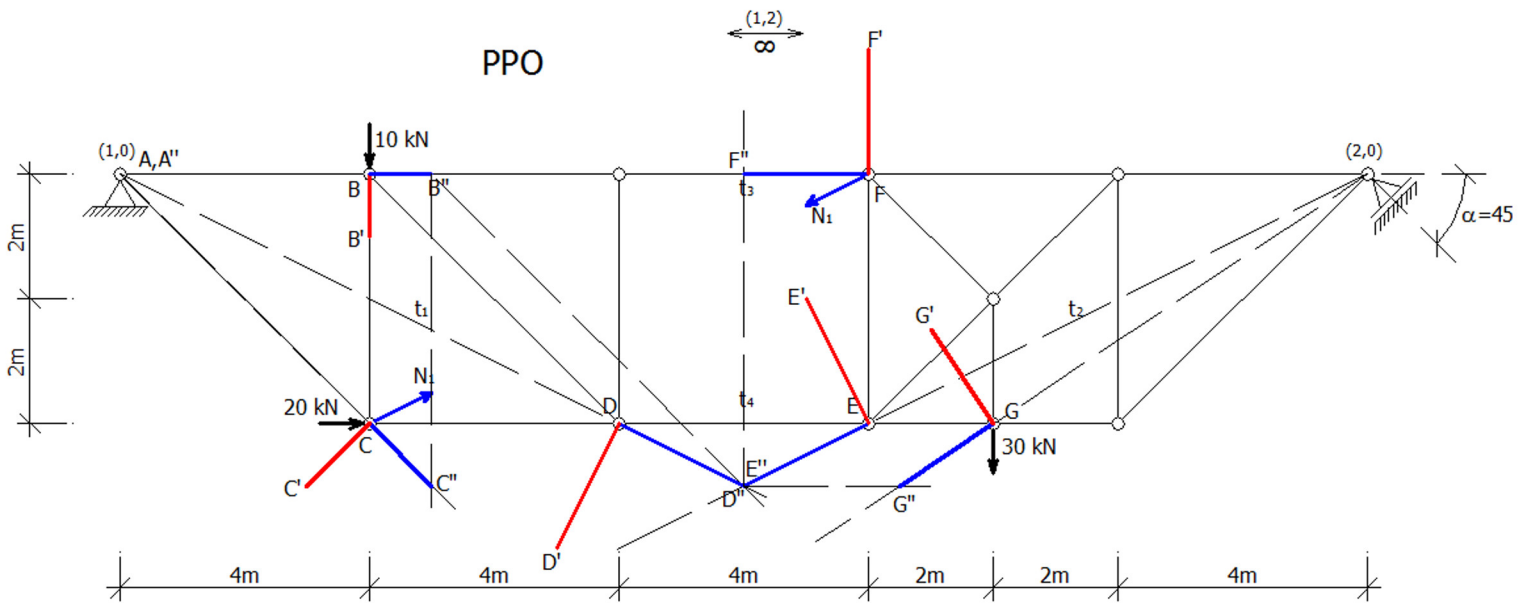
$$- \frac{4 \cdot 6}{2} \cdot 3,333 = 0$$

$$\frac{1}{3} M_\alpha = 12,1015$$

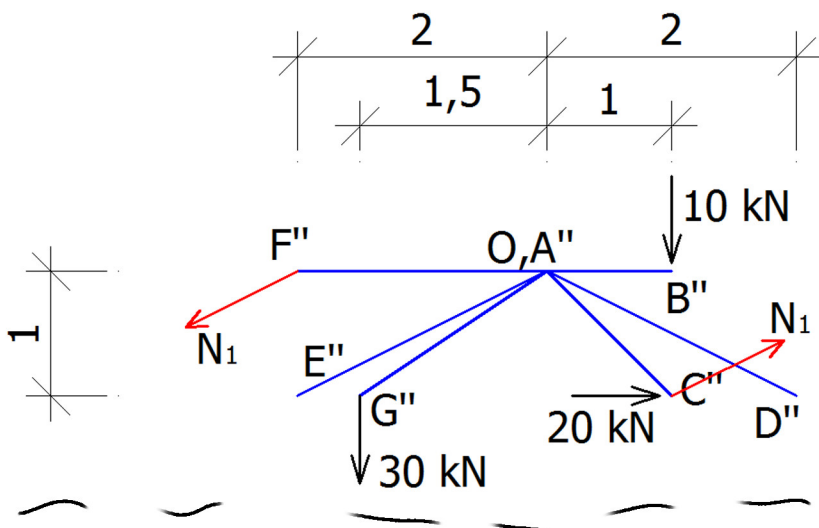
$$M_\alpha = 5,186 \text{ kNm}$$



MECHANIZM  $N_1$



BPPO



$$\sum M_o = 0$$

$$-\frac{1}{\sqrt{5}} N_1 \cdot 2 + 1 \cdot 10 +$$

$$- 20 \cdot 1 - 1,5 \cdot 30 - \frac{1}{\sqrt{5}} N_1 \cdot 1 +$$

$$-\frac{2}{\sqrt{5}} N_1 \cdot 1 = 0$$

$$N_1 = -30,746 \text{ kN}$$