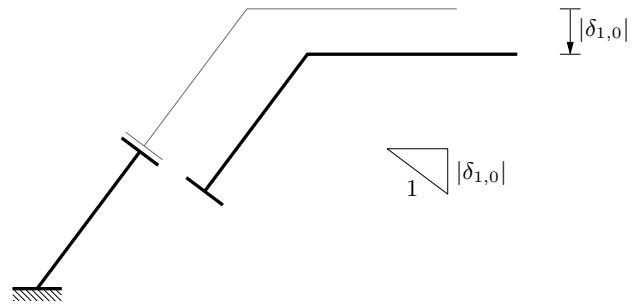
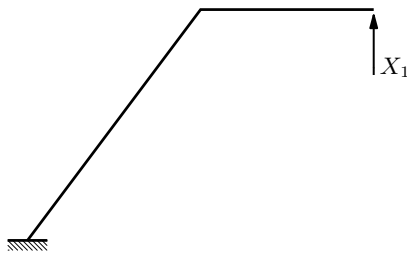


$$\eta_{Tt}$$

$$(EI)_{\{1,2\}} = (EI)_{\{2,3\}} = EI$$



$$\frac{|\delta_{1,0}|}{1} = \frac{3}{5} \Rightarrow \delta_{1,0} = -\frac{3}{5}$$

$$\delta_{1,1} X_1 + \delta_{1,0} = 0$$

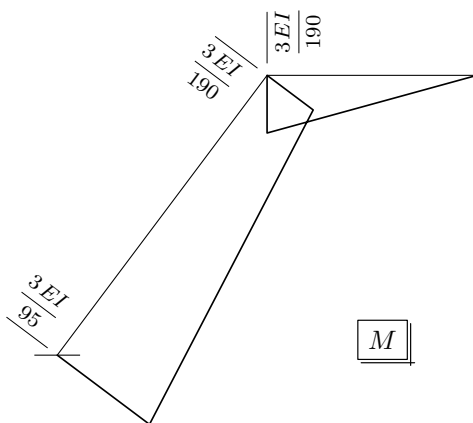
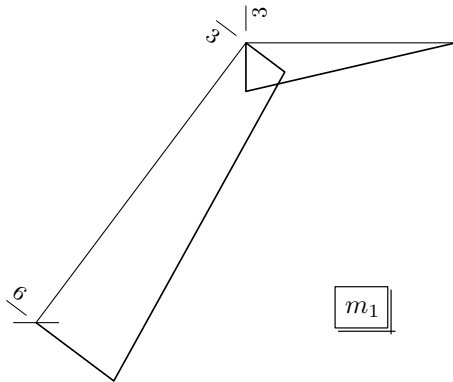
$$\delta_{1,1} X_1 = -\delta_{1,0}$$

$$\begin{aligned} \delta_{1,1} &= \frac{1}{EI} \left[\left(\frac{1}{2} \cdot 3 \cdot 3 \right) \left(\frac{2}{3} \cdot 3 \right) \right. \\ &\quad + \left(\frac{1}{2} \cdot 3 \cdot 5 \right) \left(\frac{2}{3} \cdot 3 + \frac{1}{3} \cdot 6 \right) \\ &\quad \left. + \left(\frac{1}{2} \cdot 6 \cdot 5 \right) \left(\frac{2}{3} \cdot 6 + \frac{1}{3} \cdot 3 \right) \right] \\ &= \frac{114}{EI} \end{aligned}$$

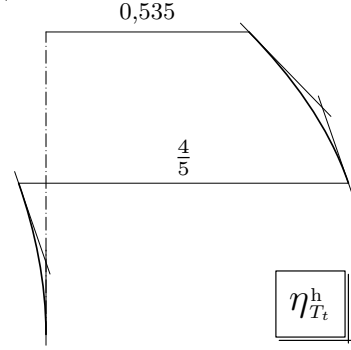
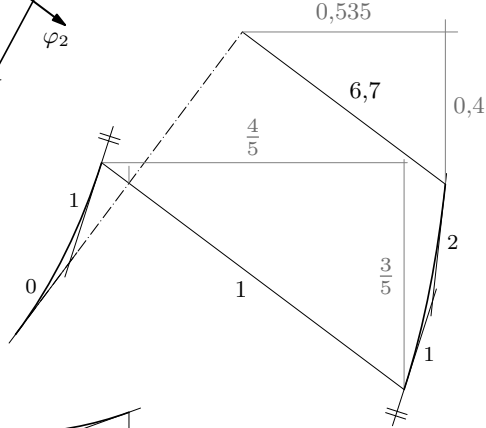
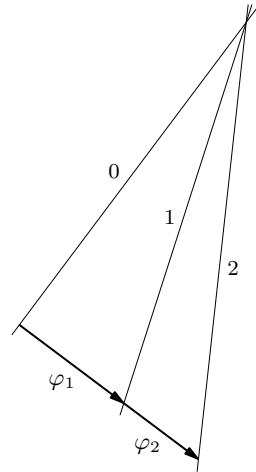
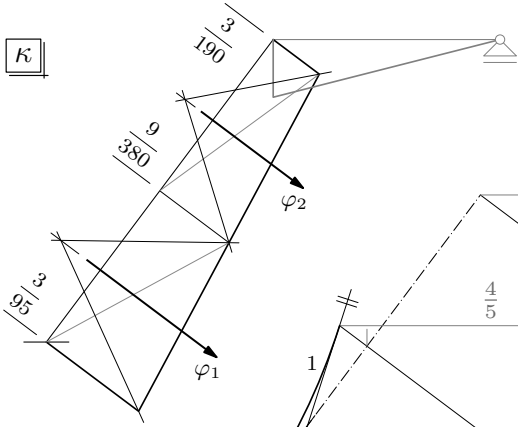
$$\frac{114}{EI} X_1 = -\left(-\frac{3}{5}\right)$$

$$X_1 = \frac{EI}{190}$$

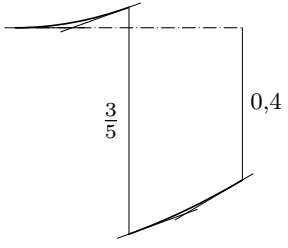
$$M(x) = X_1 m_1(x)$$



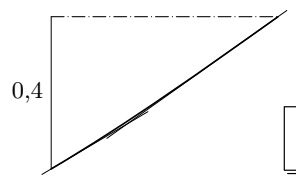
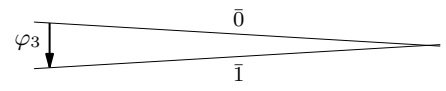
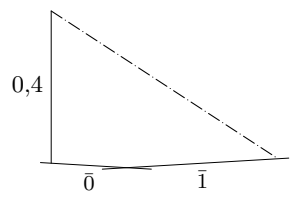
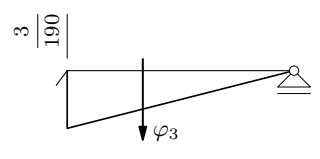
κ



$\eta_{T_t}^h$



$\eta_{T_t}^{v,s}$



$\eta_{T_t}^{v,g}$

mjerilo duljina: 1 cm :: 1 m

$$\varphi_1 = \frac{1}{2} \cdot \frac{3}{95} \cdot \frac{5}{2} + \frac{1}{2} \cdot \frac{9}{380} \cdot \frac{5}{2} = 0,0690789 \quad \tilde{\varphi}_1 = 17 + 1/4 \text{ mm}$$

$$\varphi_2 = \frac{1}{2} \cdot \frac{9}{380} \cdot \frac{5}{2} + \frac{1}{2} \cdot \frac{3}{190} \cdot \frac{5}{2} = 0,0493421 \quad \tilde{\varphi}_2 = 12 + 1/3 \text{ mm}$$

$$\varphi_3 = \frac{1}{2} \cdot \frac{3}{190} \cdot 3 = 0,0236842 \quad \tilde{\varphi}_3 = 6 \text{ mm}$$

mjerilo kutova: 1 cm :: 0,04

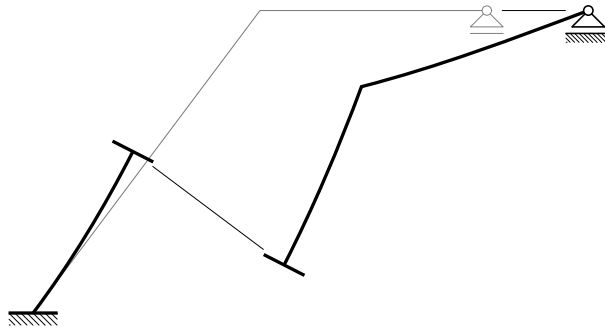
$$\tilde{\chi} = 5 \text{ cm} \Rightarrow \chi = 0,2 \Rightarrow n = 5$$

$$\eta = \frac{m}{n} \tilde{\eta} = \frac{1}{5} \tilde{\eta} \Rightarrow \tilde{\eta} = \frac{n}{m} \eta = 5 \eta \Rightarrow \tilde{l} = 5 \cdot 1 = 5 \text{ cm}$$

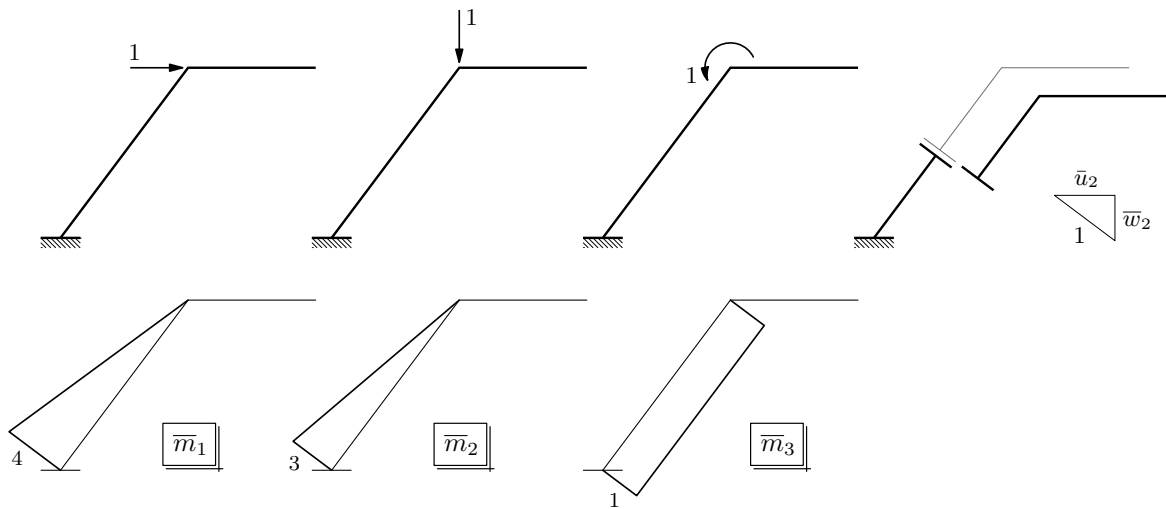
$$\tilde{\eta}_2^h = 26 + 3/4 \text{ mm} \Rightarrow \eta_2^h = 0,535$$

$$\tilde{\eta}_2^v = 20 \text{ mm} \Rightarrow \eta_2^v = 0,4$$

skica progibne linije, zora radi (mjerilo pomakā nije isto kao na slici na prethodnoj stranici):



provjera (duljine komponentata pomaka čvora 2):



$$\begin{aligned}
u_2 &= \int \frac{M \bar{m}_1}{EI} dx + \bar{u}_2 \\
&= \frac{1}{EI} \left[\left(\frac{1}{2} \cdot \frac{3EI}{95} \cdot 5 \right) \left(\frac{2}{3} \cdot 4 \right) (-1) + \left(\frac{1}{2} \cdot \frac{3EI}{190} \cdot 5 \right) \left(\frac{1}{3} \cdot 4 \right) (-1) \right] + \frac{4}{5} \\
&= 0,536842 \simeq 0,535 = \eta_2^h
\end{aligned}$$

$$\begin{aligned}
w_2 &= \int \frac{M \bar{m}_2}{EI} dx + \bar{w}_2 \\
&= \frac{1}{EI} \left[\left(\frac{1}{2} \cdot \frac{3EI}{95} \cdot 5 \right) \left(\frac{2}{3} \cdot 3 \right) (-1) + \left(\frac{1}{2} \cdot \frac{3EI}{190} \cdot 5 \right) \left(\frac{1}{3} \cdot 3 \right) (-1) \right] + \frac{3}{5} \\
&= 0,402632 \simeq 0,4 = \eta_2^v
\end{aligned}$$

$$\varphi_2^* = \int \frac{M \bar{m}_3}{EI} dx = \frac{1}{EI} \left[\left(\frac{1}{2} \cdot \frac{3EI}{95} \cdot 5 \right) \cdot 1 + \left(\frac{1}{2} \cdot \frac{3EI}{190} \cdot 5 \right) \cdot 1 \right] = 0,118421 = \varphi_1 + \varphi_2$$

na sljedećoj je stranici prikazan još jedan način crtanja utjecajnih linija

mjerilo duljina i mjerilo kutova su kao prije

$$\begin{aligned}
\varphi_{1,h} &= \frac{1}{2} \cdot \left(\frac{5}{4} \cdot \frac{3}{95} \right) \cdot 2 + \frac{1}{2} \cdot \left(\frac{5}{4} \cdot \frac{9}{380} \right) \cdot 2 \\
&= \frac{1}{2} \cdot \left(\frac{5}{4} \cdot \frac{3}{95} \right) \cdot \left(\frac{4}{5} \cdot \frac{5}{2} \right) + \frac{1}{2} \cdot \left(\frac{5}{4} \cdot \frac{9}{380} \right) \cdot \left(\frac{4}{5} \cdot \frac{5}{2} \right) = \varphi_1
\end{aligned}$$

$$\varphi_{2,h} = \varphi_2$$

$$\begin{aligned}
\varphi_{1,v} &= \frac{1}{2} \cdot \left(\frac{5}{3} \cdot \frac{3}{95} \right) \cdot 1,5 + \frac{1}{2} \cdot \left(\frac{5}{3} \cdot \frac{9}{380} \right) \cdot 1,5 \\
&= \frac{1}{2} \cdot \left(\frac{5}{3} \cdot \frac{3}{95} \right) \cdot \left(\frac{3}{5} \cdot \frac{5}{2} \right) + \frac{1}{2} \cdot \left(\frac{5}{3} \cdot \frac{9}{380} \right) \cdot \left(\frac{3}{5} \cdot \frac{5}{2} \right) = \varphi_1
\end{aligned}$$

$$\varphi_{2,v} = \varphi_2$$

... pa su i $\tilde{\varphi}_{1,h} = \tilde{\varphi}_{1,v} = \tilde{\varphi}_1$ i $\tilde{\varphi}_{2,h} = \tilde{\varphi}_{2,v} = \tilde{\varphi}_2$

φ_3 i $\tilde{\varphi}_3$ kao prije

$\tilde{\chi}$, χ i n kao prije

$$\left[\frac{4}{5} \right] = 5 \cdot \frac{4}{5} = 4 \text{ cm} \quad \mathcal{E} \quad \left[\frac{3}{5} \right] = 5 \cdot \frac{3}{5} = 3 \text{ cm}$$

