

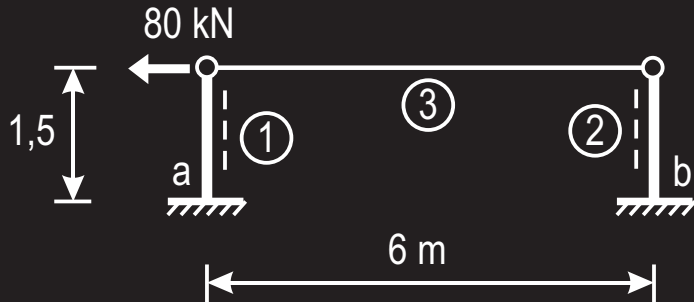
Diethard Thieme

Übungen

zur

Baustatik

BS 08



Reduzierte Stablängen

$$L'_1 = L'_2 = 1,5 \frac{1}{1} \frac{1}{1} = 1,5 \text{ m}$$

$$L''_3 = L_3 \frac{E_0 J_0}{E_3 A_3} = 6 \frac{1}{10} \frac{0,0072}{0,0004} = 10,8 \text{ m}^3$$

$$L'''_1 = L_1 \frac{E_0 J_0}{G_1 A_1} \kappa_1 = 1,5 \frac{2,1}{0,9} \frac{0,0072}{0,24} 1,2$$

$$L'''_1 = L'''_2 = 0,126 \text{ m}^3$$

Kennwerte

$$J_1 = J_2 = 720\,000 \text{ cm}^4$$

$$E_1 = E_2 = 2,1 \cdot 10^7 \text{ kN/m}^2$$

$$A_1 = A_2 = 2400 \text{ cm}^2$$

(Rechteckquerschnitt 40/60 cm)

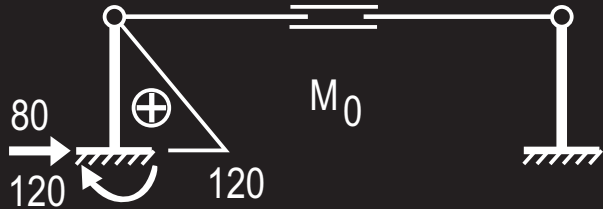
$$G_1 = G_2 = 0,9 \cdot 10^7 \text{ kN/m}^2$$

$$\kappa_1 = \kappa_2 = 1,2 \quad (\text{Rechteck})$$

$$A_3 = 4 \text{ cm}^2$$

$$E_3 = 2,1 \cdot 10^8 \text{ kN/m}^2$$

$$\text{Gewählt: } J_0 = J_1 ; E_0 = E_1$$



$$L'_1 = L'_2 = 1,5 ; L''_3 = 10,8 ; L'''_1 = L'''_2 = 0,126$$

$$a_{10} = 1,5 \frac{1}{3} 120 (-1,5) + 0,126 (-80) 1$$

$$a_{10} = -100,1 \quad \text{aus V in Stab 1}$$



$$a_{11} = 1,5 \frac{1}{3} (-1,5)^2 + 1,5 \frac{1}{3} (-1,5)^2 +$$

$$+ 10,8 \cdot 1 \cdot 1 +$$

aus N in Stab 3

$$+ 0,126 \cdot 1 \cdot 1 + 0,126 (-1)(-1) = 13,3$$

aus V in Stab 1 aus V in Stab 2

$$a_{11} X_1 = -a_{10} \quad \text{daraus } X_1 = 7,53$$

Superposition

$$M_a = 120 + 7,53 (-1,5) = 108,7 \text{ kNm}$$

$$M_b = 0 + 7,53 (-1,5) = -11,3 \text{ kNm}$$

