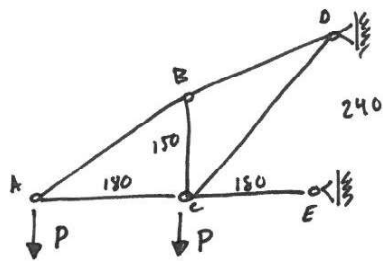


2.2.4 Fachverk * Tvärsnittarea A

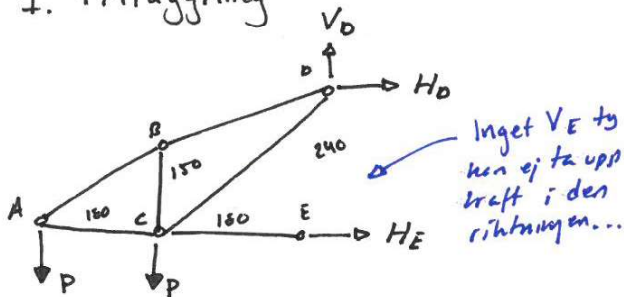
Givet



Sökt Normalspänning i stäng CD (σ_{co})

Lösning

1. Friläggning



2. Jmv

$$\uparrow: V_D - P - P = 0 \Rightarrow V_D = 2P$$

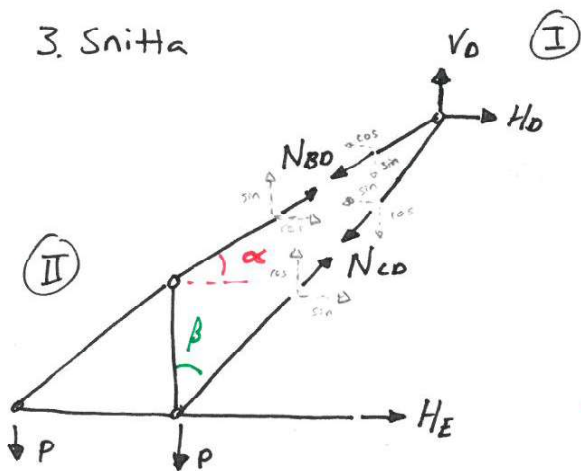
$$\rightarrow: H_D + H_E = 0 \Rightarrow H_D = -H_E$$

$$\curvearrow: 180 \cdot P + 180 \cdot V_D - 240 \cdot H_D = 0$$

$$\Rightarrow H_D = \frac{540}{240} \cdot P = \frac{9}{4} P$$

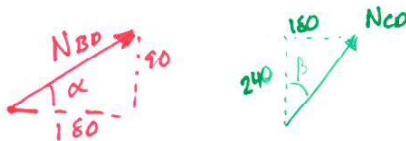
$$\text{och } H_E = -\frac{9}{4} P$$

3. Snitta



$$\cos \alpha = \frac{180}{\sqrt{180^2 + 90^2}} = \frac{2}{\sqrt{5}}; \sin \alpha = \frac{90}{\sqrt{180^2 + 90^2}} = \frac{1}{\sqrt{5}}$$

$$\cos \beta = \frac{240}{\sqrt{240^2 + 180^2}} = \frac{4}{5}; \sin \beta = \frac{180}{\sqrt{240^2 + 180^2}} = \frac{3}{5}$$



4. Jmv

$$\uparrow_I: V_D - \cos \beta \cdot N_{co} - \sin \alpha \cdot N_{BD} = 0 \Rightarrow N_{BD} = \sqrt{5} \left(2P - \frac{4}{5} \cdot N_{co} \right)$$

$$\rightarrow_I: H_D - \cos \alpha \cdot N_{BD} - \sin \beta \cdot N_{co} = 0 \Rightarrow N_{co} = \frac{5}{3} \left(\frac{9}{4} P - \frac{2}{\sqrt{5}} \cdot N_{BD} \right)$$

$$\dots \Leftrightarrow N_{BD} = \frac{3P}{\sqrt{5}} \quad \text{och} \quad N_{co} = \frac{7P}{4}$$

5. Normalspänning

$$\left[\sigma = \frac{N}{A} \right] \quad \sigma_{co} = \frac{N_{co}}{A} = \frac{7P}{4A}$$