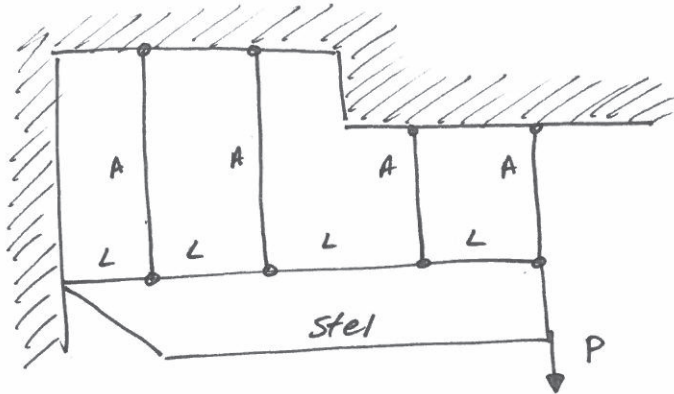


2.2.30 Givet

x Idealplastiskt
- Sträckgräns σ_s

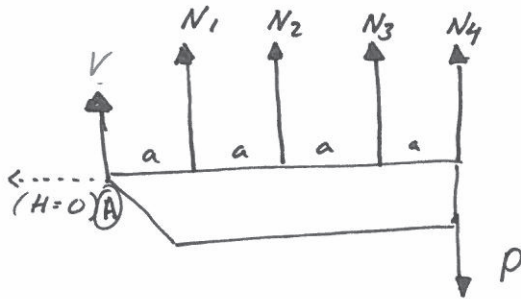


Sökt Kollapslast P_f

Lösning

(1. Frilägg, 2. Jmv)

3. Snitta



4. Jmv.

$$\uparrow: V + N_1 + N_2 + N_3 + N_4 - P = 0$$

$$\Leftrightarrow V + N_1 + N_2 + N_3 + N_4 = P$$

$$\circlearrowleft: a \cdot N_1 + 2a \cdot N_2 + 3a \cdot N_3 + 4a \cdot N_4 - 4a \cdot P = 0$$

$$\Leftrightarrow N_1 + 2N_2 + 3N_3 + 4N_4 = 4P$$

5. Normalspänning

$$\left[\sigma = \frac{N}{A} \right]$$

\Rightarrow säker då fullständigt plastisering, dvs alla stänger
har plastiserats!

$$\therefore \sigma_1 = \sigma_s = \frac{N_1}{A}; \sigma_2 = \sigma_s = \frac{N_2}{A}; \sigma_3 = \sigma_s = \frac{N_3}{A}; \sigma_4 = \sigma_s = \frac{N_4}{A}$$

$$\text{Jmv}_{sb} \Leftrightarrow \left\{ \begin{array}{l} V + \sigma_s \cdot A + \sigma_s \cdot A + \sigma_s \cdot A + \sigma_s \cdot A = P_f \Leftrightarrow V + 4\sigma_s \cdot A = P_f \\ \sigma_s \cdot A + 2 \cdot \sigma_s \cdot A + 3 \cdot \sigma_s \cdot A + 4 \cdot \sigma_s \cdot A = 4P_f \Leftrightarrow 10\sigma_s \cdot A = 4P_f \end{array} \right.$$

$$\Rightarrow \underline{P_f = \frac{10}{4} \sigma_s \cdot A = 2.5 \sigma_s \cdot A}$$