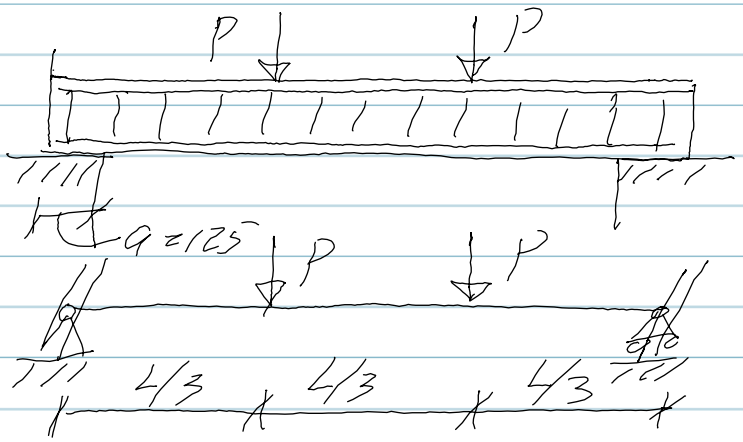
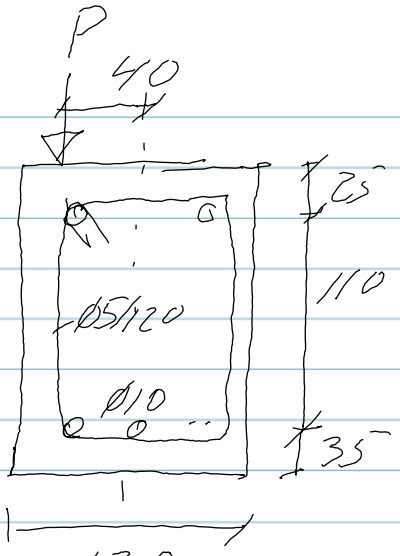
DTU. Betonkonstruktioner





$f_{cd} = 20/1{,}45 = 13{,}8\ MPa$ $\quad f_{yd} = 550/1{,}2 = 458\ MPa$

$\cot\theta = 1{,}75$

$T_{Ed} = P \cdot 40\ mm$

$T_{Rd} = \min(T_{Rd,w};\ T_{Rd,l};\ T_{Rd,c})$

$T_{Rd,w} = 2A_k \cdot \frac{A_{sw}}{s} \cdot f_{yd} \cdot \cot\theta$

$t_{ef} = \max\begin{cases} A/u = 120\cdot170/(2\cdot120+2\cdot170) = 35{,}2\ mm \\ 2(c+\phi_L+\phi/2) = 2(20+5+10/2) = \underline{\underline{60\ mm}} \end{cases}$

$T_{Rd,w} = 2(120-60)(170-60)\cdot\frac{\pi\left(\frac{5}{2}\right)^2}{120}\cdot 458\cdot 1{,}75 = \underline{\underline{1{,}7\ kNm}}$

$T_{Rd,c} = 2A_k \nu_E f_{cd} t_{ef} \cdot \frac{\cot\theta}{1+\cot^2\theta}$

$= 2\cdot(120-60)(170-60)\cdot 0{,}42\cdot 13{,}8\cdot 60\cdot \frac{1{,}75}{1+1{,}75^2} = \underline{\underline{2\ kN}}$

$\nu_E = 0{,}7(0{,}7 - f_{ck}/200) = 0{,}42$

$T_{Rd,l} = A_{sl} \cdot \sigma_{s,max} \cdot \frac{2A_k}{u_k \cdot \cot\theta}$

$= 5\pi\left(\frac{10}{2}\right)^2 \cdot 102 \cdot \frac{2(120-60)(170-60)}{(2(120-60)+2(170-60))\cdot 1{,}75}$

$= \underline{\underline{0{,}9\ kNm}} \Rightarrow T_{Rd} = 0{,}9\ kNm$