Skjærkakasptet uten skjærarmering

Betong

$h := 200\ \text{mm}$ $b := 1000\ \text{mm}$

$f_{ck} := 35\ \text{MPa}$ $\gamma_c := 1.5$

$f_{cd} := \frac{0.85 \cdot f_{ck}}{\gamma_c} = 19.8333\ \text{MPa}$

Last

$\sigma_c := 0\ \text{MPa}$ Aksialspenning i betongtverrsnitt, positiv som trykk $N_c := \sigma_c \cdot b \cdot h = 0\ \text{kN}$

$\sigma_{cp} := \min\left(\begin{bmatrix} \sigma_c \\ 0.2 \cdot f_{cd} \end{bmatrix}\right) = 0\ \text{MPa}$

$k_1 := \text{if}\ \ \sigma_{cp} \geq 0\ \text{MPa} = 0.15$
$\quad 0.15$
$\quad \text{else}$
$\quad 0.3$

$\varnothing := 12\ \text{mm}$ $c := 25\ \text{mm}$ $cc := 200\ \text{mm}$

$n := \frac{1000\ \text{mm}}{cc} = 5$ jern per meter

$n := 15 + 8 = 23$

$A_{sl} := \pi \cdot \frac{\varnothing^2}{2} \cdot n = 5202.4774\ \text{mm}^2$ $d := h - c - \frac{\varnothing}{2} = 169\ \text{mm}$

$\gamma_c := 1.5$ $k := 0.15$ $f_{ck} := 30\ \text{MPa}$

$C_{Rd.c} := \frac{k}{\gamma_c} = 0.1$

$k := \min\left(\begin{bmatrix} 1 + \sqrt{\frac{200}{d\ \text{mm}}} \\ 2 \end{bmatrix}\right) = 2$ $\rho_1 := \min\left(\begin{bmatrix} \frac{A_{sl}}{b \cdot d} \\ 0.02 \end{bmatrix}\right) = 0.02$

$V_{Rd.c.0} := \left(C_{Rd.c} \cdot k \cdot \left(100 \cdot \rho_1 \cdot \frac{f_{ck}}{\text{MPa}}\right)^{\frac{1}{3}} + k_1 \cdot \frac{\sigma_{cp}}{\text{MPa}}\right) \cdot b \cdot d\ \text{MPa} = 132.3225\ \text{kN}$

$v_{min} := 0.035 \cdot k^{1.5} \cdot \left(\frac{f_{ck}}{\text{MPa}}\right)^{0.5}\ \text{MPa} \cdot b \cdot d = 91.6348\ \text{kN}$

$V_{Rd.c} := \max\left(\begin{bmatrix} V_{Rd.c.0} \\ v_{min} \end{bmatrix}\right) = 132.3225\ \text{kN}$