

## POS. 25: COLUMN WEB IN TRANSVERSE TENSION

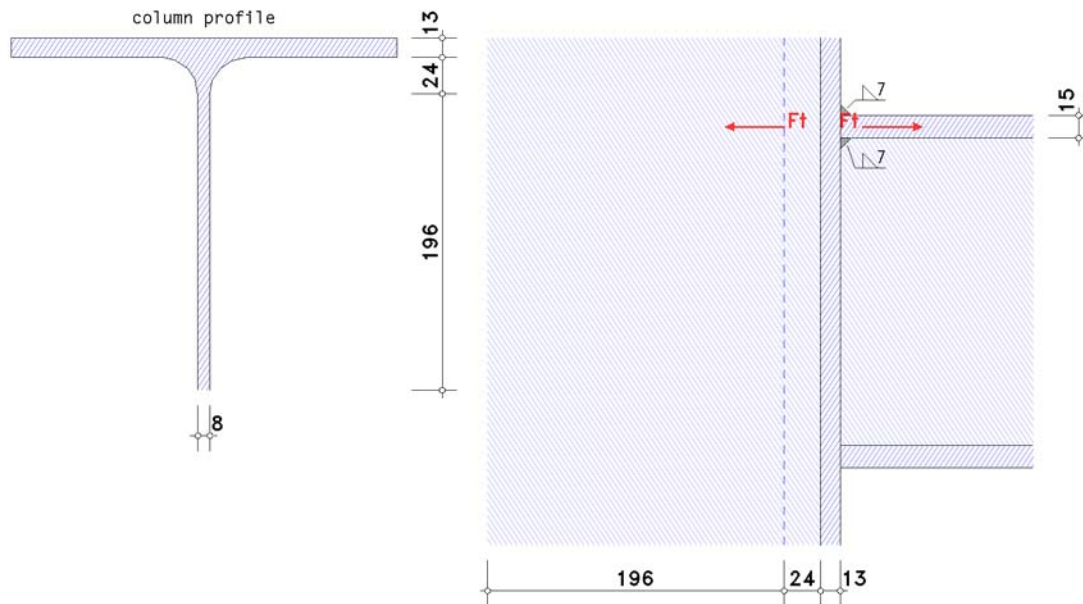
4H-EC3GK version: 1/2012-1k

### column web in transverse tension

#### Basic component 3

EC 3-1-8 (12.10), NA: Germany

M 1:5.0



#### welded connection

column:

- clear depth of the web  $d_c = 196.0$  mm
- web thickness  $t_{wc} = 8.0$  mm
- flange thickness  $t_{fc} = 13.0$  mm
- root resp. leg length of the web weld  $s_c = 24.0$  mm
- steel grade S 275
- shear area  $A_{vc} = 3174.00$  mm<sup>2</sup>

beam:

- flange thickness  $t_{fb} = 15.0$  mm
- weld between tension flange of beam and column flange  $a_b = 7.0$  mm
- transformation parameter due to influence of the column web panel  $\beta = 1.00$
- safety factor:  $\gamma_{M0} = 1.00$

stress:

$$\text{Lk 1 : } F_{t,wc,Ed} = 400.0 \text{ kN}$$

#### design resistance

effective column web width in transverse tension  $b_{eff,t,wc} = t_{fb} + 2 \cdot 2^{1/2} \cdot a_b + 5 \cdot (t_{fc} + s_c) = 219.8$  mm

reduction factor for interaction with shear stress:  $\beta = 1 \Rightarrow \omega = 0.85$

design resistance of an unstiffened column web in transverse tension

$$F_{t,wc,Rd} = \omega \cdot (b_{eff,t,wc} \cdot t_{wc} \cdot f_{y,wc}) / \gamma_{M0} = 408.8 \text{ kN}$$

#### verification

$$\text{Lk 1 : } F_{Ed} = 400.0 \text{ kN} < F_{Rd} = 408.8 \text{ kN} \Rightarrow \text{utilization} = 0.978 < 1 \text{ ok.}$$