POS. 31: PLATE IN TENSION OR COMPRESSION

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

plate in tension or compression

Basic component 9

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

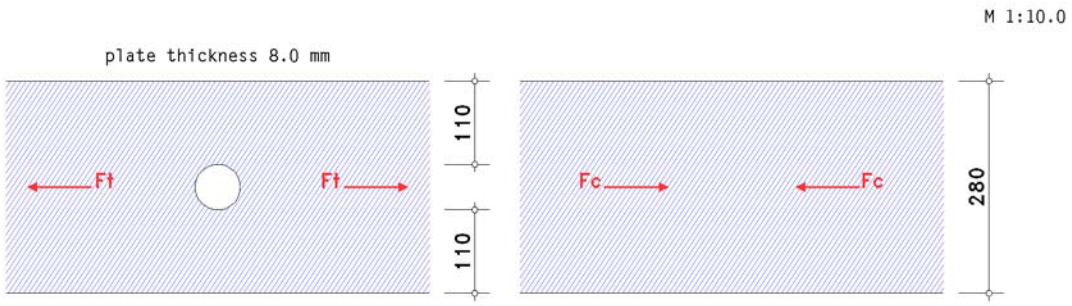

plate thickness t = 8.0 mm, plate width b = 280.0 mm, p. w. with deduction of holes b_{net} = 220.0 mm, steel grade S 275
section class 2 (design plastic moment resistance, limited rotation capacity)
partial safety factors for material: γ_{M0} = 1.00 γ_{M2} = 1.25
stress:
Lk 1 : $F_{t,Ed}$ = 400.0 kN $F_{c,Ed}$ = 600.0 kN

design resistance

design resistance of plate in tension:
$N_{pl,Rd} = (A \cdot f_y) / \gamma_{M0}$ = 616.00 kN
$N_{u,Rd} = (0.9 \cdot A_{net} \cdot f_u) / \gamma_{M2}$ = 544.90 kN
$F_{t,Rd} = \min(N_{pl,Rd}, N_{u,Rd})$ = 544.90 kN
design resistance of plate in compression:
compression stress capacity for section class 2: $F_{c,Rd} = (A \cdot f_y) / \gamma_{M0}$ = 616.00 kN with $A = b \cdot t$ = 22.40 cm²

verification

Lk 1:	tension:	F_{Ed} = 400.0 kN	<	F_{Rd} = 544.9 kN	⇒	utilization = 0.734	<	1 **ok.**
	compr. :	F_{Ed} = 600.0 kN	<	F_{Rd} = 616.0 kN	⇒	utilization = 0.974	<	1 **ok.**