$$\sigma_{h,Ed} = 0{,}591 \sqrt{\frac{E\ F_{Ed,ser}\ (d_0 - d)}{d^2\ t}} \qquad \text{... (3.15)}$$

$$f_{h,Ed} = 2{,}5\, f_y / \gamma_{M6,ser} \qquad \text{... (3.16)}$$

where:

d is the diameter of the pin;

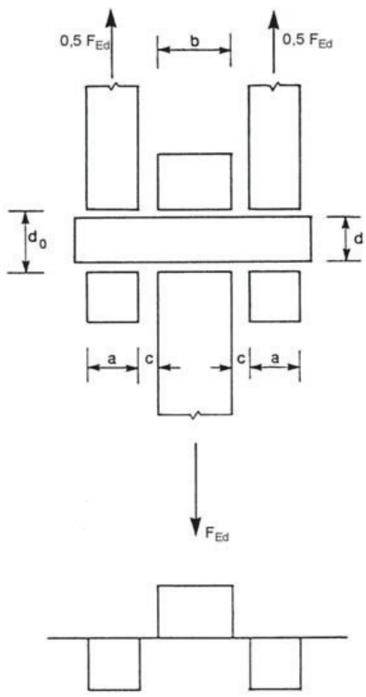
d_0 is the diameter of the pin hole;

$F_{Ed,ser}$ is the design value of the force to be transferred in bearing, under the characteristic load combination for serviceability limit states.

Table 3.10: Design criteria for pin connections

Failure mode	Design requirements
Shear resistance of the pin	$F_{v,Rd} = 0{,}6\, A\, f_{up} / \gamma_{M2} \geq F_{v,Ed}$
Bearing resistance of the plate and the pin If the pin is intended to be replaceable this requirement should also be satisfied.	$F_{b,Rd} = 1{,}5\, t\, d\, f_y / \gamma_{M0} \geq F_{b,Ed}$ $F_{b,Rd,ser} = 0{,}6\, t\, d\, f_y / \gamma_{M6,ser} \geq F_{b,Ed,ser}$
Bending resistance of the pin If the pin is intended to be replaceable this requirement should also be satisfied.	$M_{Rd} = 1{,}5\, W_{e\ell}\, f_{yp} / \gamma_{M0} \geq M_{Ed}$ $M_{Rd,ser} = 0{,}8\, W_{e\ell}\, f_{yp} / \gamma_{M6,ser} \geq M_{Ed,ser}$
Combined shear and bending resistance of the pin	$\left[\frac{M_{Ed}}{M_{Rd}}\right]^2 + \left[\frac{F_{v,Ed}}{F_{v,Rd}}\right]^2 \leq 1$

d is the diameter of the pin;
f_y is the lower of the design strengths of the pin and the connected part;
f_{up} is the ultimate tensile strength of the pin;
f_{yp} is the yield strength of the pin;
t is the thickness of the connected part;
A is the cross-sectional area of a pin.



$$M_{Ed} = \frac{F_{Ed}}{8}(b + 4c + 2a)$$

Figure 3.11: Bending moment in a pin