

[Remarks:](#) See §5.2.3, pages 288 till 394

[Answers:](#)

10 ring dowels are needed

[Explanation:](#)

Cross-section properties:

$$I_{zz} = (60,75 \times 10^6 \text{ mm}^3) \times b$$

$$S_z^a = (101,25 \times 10^3 \text{ mm}^2) \times b$$

The shear force per length is:

$$s_x^a = \frac{V \times (101,25 \times 10^3 \text{ mm}^2) \times b}{(60,75 \times 10^6 \text{ mm}^3) \times b} = (1,67 \times 10^{-3} \text{ mm}^{-1}) \times V$$

The total shear force is:

$$\int s_x^a dx = (1,67 \times 10^{-3} \text{ mm}^{-1}) (24 \times 10^3 \text{ N}) (4750 \text{ mm}) = 190380 \text{ N}$$

The number of dowels needed are:

$$n \geq \frac{190380}{20000} = 9,52 \Rightarrow n = 10$$