Remarks: See §4.6, pages 168 till 170

Answer:

$b \geq 240$ mm

Explanation:

$M_{max} = M_{span} = 100$ kNm

$$\sigma_{max} = \frac{M_{max}}{W} \leq \bar{\sigma} = 10 \text{ N/mm}^2$$

$$W = \tfrac{1}{6} b h^2 \geq \frac{M_{max}}{\bar{\sigma}}$$

Choosing h as large as possible, thus $h = 500$ mm

$$b \geq \frac{6 M_{max}}{h^2 \bar{\sigma}} = \frac{6 \times (100 \times 10^6 \text{ Nmm})}{(500 \text{ mm})^2 (10 \text{ N/mm}^2)} = 240 \text{ mm}$$