Remarks: See §5.4.1, pages 310 till 322

Answers:

a. d
b. b

Explanation:

Formula: $\tau = \dfrac{VS^{\mathrm{a}}}{b^{\mathrm{a}} I}$

The normal center is located at the flange-web junction.

$I = 21,6 \times 10^{9}\ \mathrm{mm}^4$

a. The choice is between a and d since the shear force is largest at these points:

$V = (4\ \mathrm{m}) \times q$

In a: $S^{\mathrm{a}} = 32 \times 10^{6}\ \mathrm{mm}^3$ and $b^{\mathrm{a}} = 800\ \mathrm{mm}$

$\tau_{\mathrm{a}} = \dfrac{7,407}{1\ \mathrm{m}} \times q$

In d: $S^{\mathrm{a}} = 35 \times 10^{6}\ \mathrm{mm}^3$ and $b^{\mathrm{a}} = 200\ \mathrm{mm}$

$\tau_{\mathrm{d}} = \dfrac{32,407}{1\ \mathrm{m}} \times q$

b. The choice is between b and c

In b: $V = (2\ \mathrm{m}) \times q$, $S^{\mathrm{a}} = 32 \times 10^{6}\ \mathrm{mm}^3$ and $b^{\mathrm{a}} = 800\ \mathrm{mm}$

$\tau_{\mathrm{b}} = \dfrac{3,704}{1\ \mathrm{m}} \times q$

In c: $V = (1\ \mathrm{m}) \times q$, $S^{\mathrm{a}} = 35 \times 10^{6}\ \mathrm{mm}^3$ and $b^{\mathrm{a}} = 200\ \mathrm{mm}$

$\tau_{\mathrm{c}} = \dfrac{8,102}{1\ \mathrm{m}} \times q$