Solutions

2.1

- $M_{max} = PL/4 = \mathbf{8.0}$ kN $\cdot$ m; $\sigma = Mc/I = 8000 \times 0.05/(4.167 \times 10^{-6}) = \mathbf{96.0}$ MPa.
- $S = I/c = 4.167 \times 10^{-6}/0.05 = \mathbf{83.3} \times \mathbf{10^{-6}}$ m^3.

2.2

- $V_{max} = P/2 = 4$ kN; $\tau_{max} = 1.5V/A = 1.5 \times 4000/0.005 = \mathbf{1.2}$ MPa.

2.3

- $EI = 200 \times 10^9 \times 4.167 \times 10^{-6} = 8.333 \times 10^5$ N m^2.
- $\delta = PL^3/(48EI) = 512\,000/(4.000 \times 10^7) = \mathbf{12.8}$ mm.

2.4

- $\delta = PL^3/(3EI) = 4050/(2.500 \times 10^6) = \mathbf{1.62}$ mm.
- Increase the section depth: I carries h^3 - double the depth, one eighth the sag.

exercises.lol exercises.com.cn