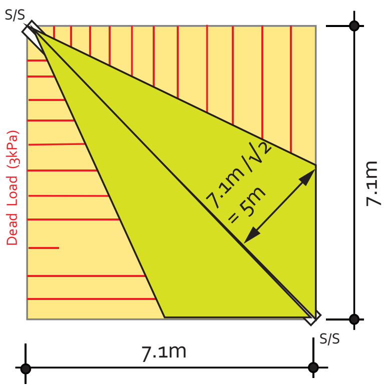
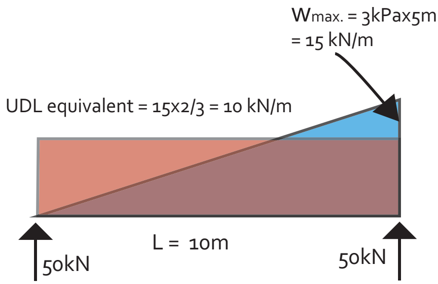
Answers to Question 2

Simply Supported Beam





$M_{max} = w_{(udl)}L^2/8 = 10 \times 10^2/8 = 125$kNm

$\Delta n = 5w_{(udl)}L^4/384EI$
$= 5 \times 10 \times 10000^4 /384/205e3/615e6$
= 10.3mm

Answers

2(a)

10m span (7/cos45°); peak load 15kN/m- See above. Multiply Area load x loaded width.

2(b)

125kNm - This is wl²/8 for a uniformly distributed line load (UDL) of 10kN/m; obtained from the peak triangular load. (15x2/3) with reference to figure 2.2.8. Slightly *under* is to assume UDL 50% peak, but this is not '*conservative*' (slightly under at **94kNm**). Actual triangular loading moment is ***97kNm***.

2(c)

10.3mm - Deflection from figure 2.2.3 [5wl⁴/(384EI)]. UDL from 2(b) above of 10kN/m. Actual triangular load deflection is ***7.8mm*** (***7.7mm*** for UDL 50% peak).

2(d)

50kN for both cases. Maximum shear for the triangular loading is under the support on the right hand side (RHS). Using the equivalent UDL will always give a safe shear/support reaction.