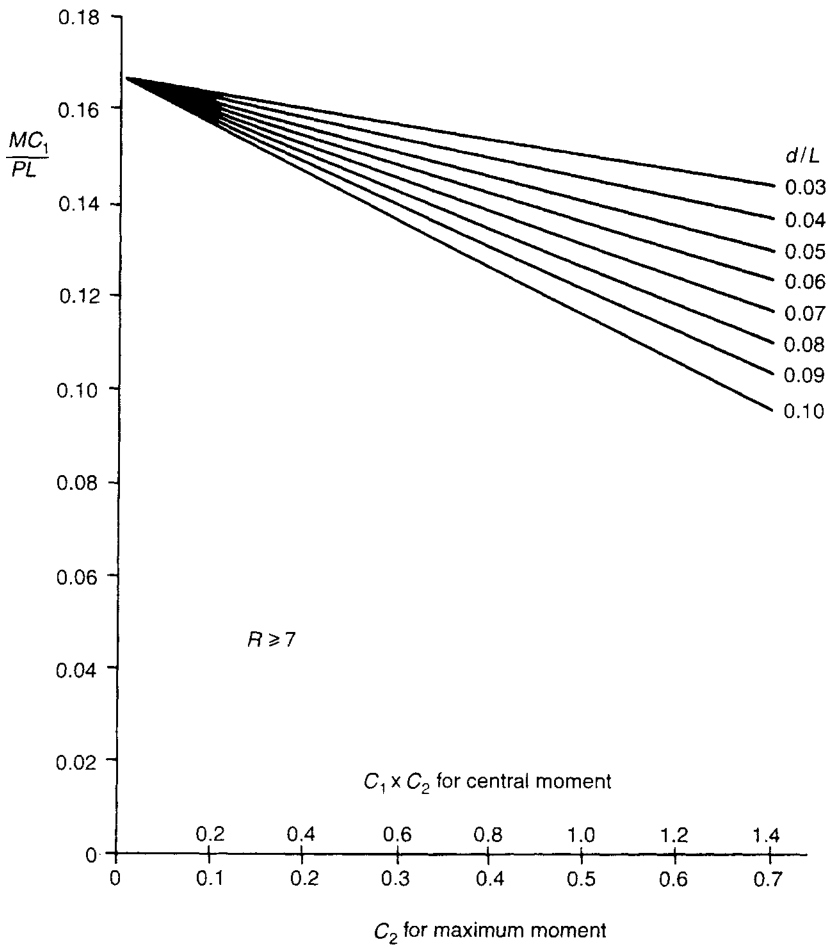

Fig. 8.9 Moments for triangular stress distribution.

- S=0.30 for $R \leqslant 5$
- S=0.33 for R between 5 and 7
- S=0.5 for $R \geqslant 7$

(e) Example

To illustrate the use of the method consider the wall-beam shown in Fig. 8.10. Here

$$E_{bm}/E_w = 30$$

$$I_b = 115 \times 218/12 = 9.93 \times 10^7\,\text{mm}^4$$

$$R = [(1829^3 \times 115 \times 1)/(9.93 \times 10^7 \times 30)]^{1/4} = (236.23)^{1/4} = 3.92$$

$$K_1 = (1829 \times 115)/(30 \times 115 \times 218) = 0.28$$

$$h/L = 1829/2743 = 0.67$$

$$d/L = 218/2743 = 0.079$$

$$\text{total load} = 0.07 \times 2743 \times 115 = 22\,081\,\text{N}$$

Using the graphs, C_1=6.8 and C_2=0.325. Therefore

$$f_m = (22\,081 \times 6.8)/(2743 \times 115) = 0.476\,\text{N/mm}^2 \tag{8.13}$$

$$T = 22\,081 \times 0.325 = 7176.3\,\text{N} \tag{8.14}$$

$$\tau_m = (22\,081 \times 6.8 \times 0.325)/(2743 \times 115) = 0.1547\,\text{N/mm}^2 \tag{8.15}$$

From Fig. 8.7, $M_c\, C_1/PL$=0.115 and $M_m\, C_1/PL$=0.144 where M_c=centre line moment and M_m=maximum moment, or

$$M_c = (0.115 \times 22\,081 \times 2743)/6.8 = 1.02 \times 10^6\,\text{N mm}$$

$$M_m = (0.144 \times 22\,081 \times 2743)/6.8 = 1.28 \times 10^6\,\text{N mm}$$

Location of maximum moment from support

$$22\,081/(2 \times 0.3 \times 0.48 \times 115) = 666.7\,\text{mm}$$

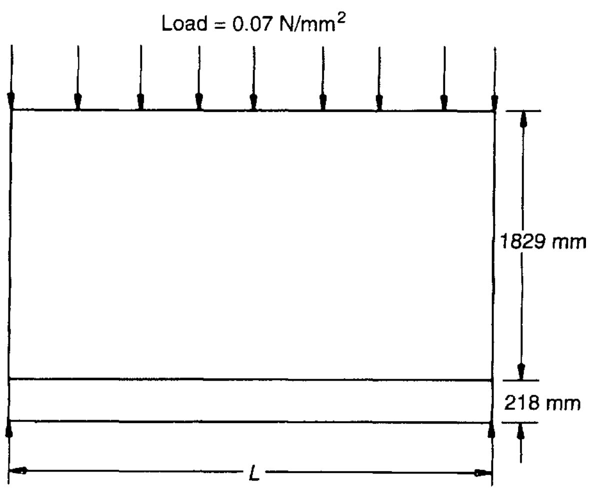

Fig. 8.10 Dimensions for wall beam example. L=2743 mm, b=t=115 mm.