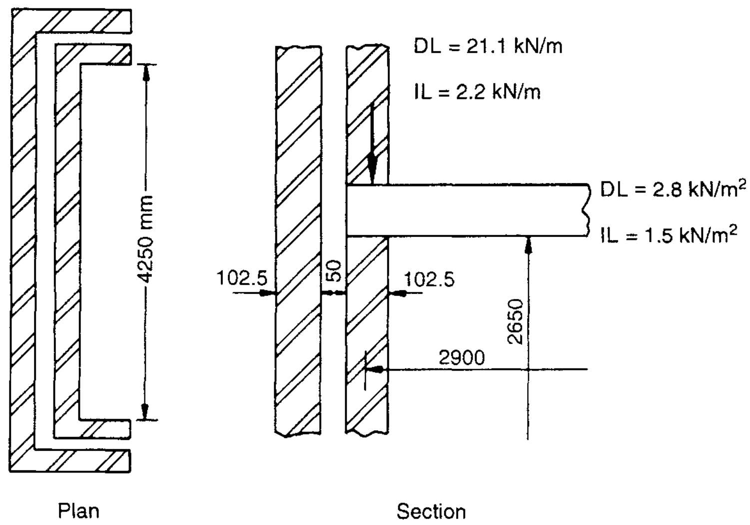

Fig. 5.17 Plan and section details for example 2.

Safety factors

$$\gamma_m = 3.5$$
$$\gamma_f\ (DL) = 1.4$$
$$\gamma_f\ (LL) = 1.6$$

Design vertical loading (Fig. 5.18)

Load from above=1.4×21.1+1.6×2.2=33.1kN/m
Self-weight of wall=1.4×17=23.8kN/m
Total vertical design load W_1=66.1kN/m
Load from slab W_2=1.4×4.1+1.6×2.2=9.2kN/m

Slenderness ratio
Effective height=0.75×2650=1988mm
Effective thickness=2(102.5+102.5)/3=136mm
Slenderness ratio=1988/136=14.6

Eccentricity
See section 5.5.1. Taking moments about centre line

$$(W_1 + W_2)e_x = W_2 t/6$$
$$e_x = (9.2 \times 102.5)/6(66.1 + 9.2)$$
$$= 2.38\,\text{mm}$$

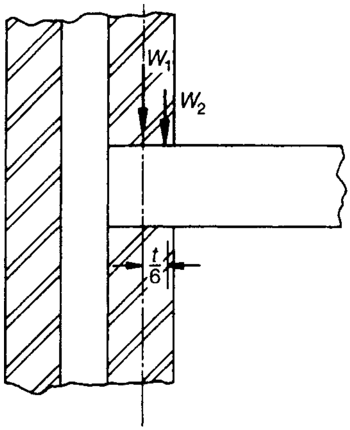

Fig. 5.18 Loading arrangement for eccentricity calculations.

From equation (5.2)

$$e_t = 0.6 \times 2.38 + 102.5\,[(1/2400) \times (14.6)^2 - 0.015]$$

$$= 1.428 + 7.566 = 8.994\,\text{mm}$$

So that, since e_t is greater than e_x, e_m=e_m=0.088t which is greater than 0.05t, with the result that:

$$\beta = 1.1\,[1 - (2 \times 0.088)] = 0.91$$

Design vertical load resistance
Assume t in mm and f_k in N/mm^2.

$$\text{design vertical load resistance} = (\beta t f_k)/\gamma_m = 0.91 \times 102.5 \times f_k/3.5$$

$$= 26.65 f_k \quad (\text{N/mm or kN/m})$$

Determination of f_k
We have

design vertical load=design vertical load resistance

$$(33.1 + 9.2 + 23.8)\,\text{kN/m} = 26.65 f_k\,\text{kN/m}$$

$$f_k = 2.48\,\text{N/mm}^2$$