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11 GROVE ROAD, WREXHAM

STEEL BEAM DESIGN TO BS 5950

Summary of Design Data

Notes All dimensions are in mm and all forces are per metre run
Steel grade S275 to BSEN 10025

Loading Factors

Imposed Load : 1.6 {Table 2}
Dead Load : 1.4 {Table 2}

Beam Over Kitchen/Dining Opening

Clear span 2900 mm.

Supporting wall over height 3.0m , floor load width $3.0/2 = 1.5$ m and roof load width $3.0/2 = 1.5$ m.

Dead load wall	= 7.2×3.0	= 21.6×1.4	= 30.2 kN/m (fact)
Dead load floor	= 0.5×1.5	= 0.75×1.4	= 1.1 kN/m (fact)
Dead load roof	= 1.3×1.5	= 2.0×1.4	= 2.7 kN/m (fact)

Total dead load = 24.4 kN/m (unf) 34.0 kN/m (fact)

Live load floor	= 1.5×1.5	= 2.3×1.6	= 3.6 kN/m (fact)
Live load roof	= 0.85×1.5	= 1.3×1.6	= 2.0 kN/m (fact)

Total live load = 3.6 kN/m (unf) 3.6 kN/m (fact)

Total load = 28.0 kN/m (unf) 37.6 kN/m (fact)

$$M = 37.6 \times 3.1^2 / 8 = 45.2 \text{ kNm}$$

Use min two number 152x153x23 UC $M_b = 40 \times 2 = 80 \text{ kNm}$ Satis.

$$\delta = \frac{5 \times 28.0 \times 3100^4}{384 \times 205 \times 10^3 \times 1250 \times 10^4 \times 2} = 6.6 \text{ mm} \text{ Satis.}$$

Check single inner beam $M = 24.5 \times 3.1^2 / 8 = 29.4 \text{ kNm}$ 152x153x23 UC Satis
Beams do not require bolting together.

$$R = 28.0 \times 3.1/2 = 43.4 \text{ kN. (unf)}$$

Use 225 x 100 x 215 dp C20 concrete padstones under each beam bearing.

Beam to be minimum two number 152x152x23 UC's each on 225 x 100 x 215 dp C20 concrete padstone bearings at each end. Beams do not require bolting together.