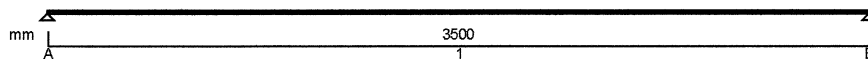


TIMBER JOIST DESIGN (BS5268-2:2002)

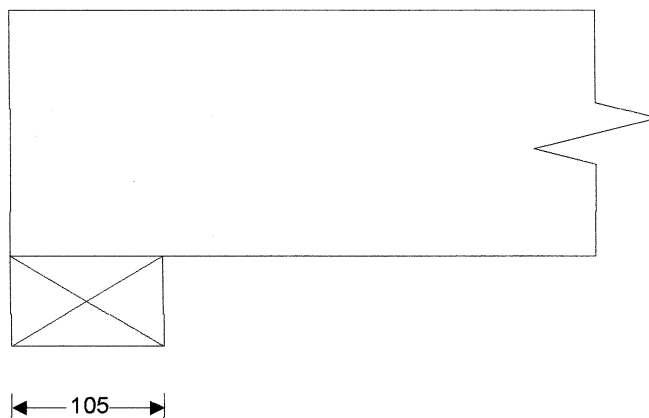
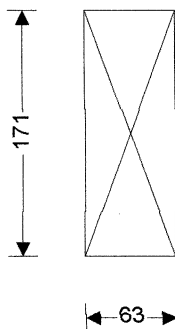
TEDDS calculation version 1.1.02

Joist details

Joist breadth	b = 63 mm
Joist depth	h = 171 mm
Joist spacing	s = 400 mm
Timber strength class	C16
Service class of timber	1


Span details

Number of spans	N_{span} = 1
Length of bearing	L_b = 105 mm
Effective length of span	L_{s1} = 3500 mm


Section properties

Second moment of area	I = b × h³ / 12 = 26157155 mm⁴
Section modulus	Z = b × h² / 6 = 305485 mm³

Loading details

Joist self weight	F_{swt} = b × h × ρ_{char} × g_{acc} = 0.03 kN/m
Dead load	F_{d_udi} = 0.75 kN/m²
Imposed UDL(Medium term)	F_{i_udi} = 2.13 kN/m²

Modification factors

Service class for bending parallel to grain	K_{2m} = 1.00
Service class for compression	K_{2c} = 1.00
Service class for shear parallel to grain	K_{2s} = 1.00

Platt White Partnership Nova House, 94 Boughton CHESTER, CH3 5AQ Tel: 01244 314111 Fax: 01244 314700 e-mail: info@plattwhite.co.uk web: www.plattwhite.co.uk Platt White Partnership	Project 11 College Street			Job no. 1554	
	Calcs for Check on equivalent joist size to carry stud partitions			Start page no./Revision 2	
	Calcs by Kp	Calcs date 20/04/2016	Checked by	Checked date	Approved by Approved date

Service class for modulus of elasticity $K_{2e} = 1.00$

Section depth factor $K_7 = 1.06$

Load sharing factor $K_8 = 1.10$

Consider medium term loads

Load duration factor $K_3 = 1.25$

Maximum bending moment $M = 1.811$ kNm

Maximum shear force $V = 2.069$ kN

Maximum support reaction $R = 2.069$ kN

Maximum deflection $\delta = 10.407$ mm

Check bending stress

Bending stress $\sigma_m = 5.300$ N/mm²

Permissible bending stress $\sigma_{m_adm} = \sigma_m \times K_{2m} \times K_3 \times K_7 \times K_8 = 7.751$ N/mm²

Applied bending stress $\sigma_{m_max} = M / Z = 5.927$ N/mm²

PASS - Applied bending stress within permissible limits

Check shear stress

Shear stress $\tau = 0.670$ N/mm²

Permissible shear stress $\tau_{adm} = \tau \times K_{2s} \times K_3 \times K_8 = 0.921$ N/mm²

Applied shear stress $\tau_{max} = 3 \times V / (2 \times b \times h) = 0.290$ N/mm²

PASS - Applied shear stress within permissible limits

Check bearing stress

Compression perpendicular to grain (no wane) $\sigma_{cp1} = 2.200$ N/mm²

Permissible bearing stress $\sigma_{c_adm} = \sigma_{cp1} \times K_{2c} \times K_3 \times K_8 = 3.025$ N/mm²

Applied bearing stress $\sigma_{c_max} = R / (b \times L_b) = 0.315$ N/mm²

PASS - Applied bearing stress within permissible limits

Check deflection

Permissible deflection $\delta_{adm} = \min(L_{s1} \times 0.003, 14 \text{ mm}) = 10.500$ mm

Bending deflection (based on E_{mean}) $\delta_{bending} = 10.038$ mm

Shear deflection $\delta_{shear} = 0.369$ mm

Total deflection $\delta = \delta_{bending} + \delta_{shear} = 10.407$ mm

PASS - Actual deflection within permissible limits