

Calculation sheet

Site: The Friends Meeting House

Client: Cadotec

Made by PS

Job No.: 2383

Date: Nov 2018

Sheet of

Timber design to BS5268 pt. 2

Member Joist A; first floor as existing

Beam type: joist/rafter=1 lintol=2 1 @ 400 c/c Material Sawn

Span (m) 2.90 Simply supported

Beam loading arrangement

Distributed loads

1	floor	2.90	0.40	2.50	2.9	kN
2					0	kN
3					0	kN
4					0	kN
5					0	kN

Point loads

1					0	kN
2					0	kN
3					0	kN
4					0	kN
5					0	kN

Total load 2.90 kN

Reactions R1 = 1.450 kN Zero shear at a = 1.45 Equiv udl = 2.900 kN
R2 = 1.450 kN Max bending M = 1.051 kNm M mid = 1.05 kNm

Modification factors:-

Load duration (long=1.0 medium=1.25 short=1.5) 1.00 k3
Load sharing 1.1 k8
Section shape 1.101 k7
Trimmers/lintols:- mean MoE 1.000 k9
Glulam laminations N/A k15

Try section:- depth (mm) 125 X width (mm) 47 Sawn timber
Grade C24 Sawn timber only
No. of members (if joists/rafters enter 5) 5

Bending stress $\sigma_m a ||$ = 8.589 N/mm²
 $\sigma_m ||$ = 7.5
 $\sigma_m adm ||$ = 9.084 N/mm² O.K ? Yes

Deflection check δ_{adm} = 8.7 mm
MoE inc K9 = 10800 N/mm²
Load δ_a = 11.147 mm
Shear δ_a = 0.33 mm
Total δ_a = 11.481 mm O.K ? No

Shear check adm = 0.78
O.K. R1 0.37 N/mm²
O.K. R2 0.37 N/mm²

Use 125x47 C24 timbers spaced at 400 centres

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Beam type: joist/rafter=1 lintol=2 1 @ 400 c/c Material Sawn

Span (m) 2.90 Simply supported

Beam loading arrangement

Distributed loads

1	floor	2.90	0.40	2.50	2.9	kN
2					0	kN
3					0	kN
4					0	kN
5					0	kN

Point loads

1					0	kN
2					0	kN
3					0	kN
4					0	kN
5					0	kN

Total load 2.90 kN

Reactions R1 = 1.450 kN Zero shear at a = 1.45 Equiv udl = 2.900 kN
R2 = 1.450 kN Max bending M = 1.051 kNm M mid = 1.05 kNm

Modification factors:-

Load duration (long=1.0 medium=1.25 short=1.5) 1.00 k3
Load sharing 1.1 k8
Section shape 1.101 k7
Trimmers/lintols:- mean MoE 1.000 k9
Glulam laminations N/A k15

Try section:- depth (mm) 125 X width (mm) 94 Sawn timber
Grade C24 Sawn timber only
No. of members (if joists/rafters enter 5) 5

Bending stress $\sigma_m a ||$ = 4.294 N/mm²
 $\sigma_m ||$ = 7.5
 $\sigma_m adm ||$ = 9.084 N/mm² O.K ? Yes

Deflection check δ_{adm} = 8.7 mm
MoE inc K9 = 10800 N/mm²
Load δ_a = 5.574 mm
Shear δ_a = 0.17 mm
Total δ_a = 5.740 mm O.K ? Yes

Shear check adm = 0.78
O.K. R1 0.19 N/mm²
O.K. R2 0.19 N/mm²

Use 125x94 C24 timbers spaced at 400 centres