

# Masonite Beams Technical Guide for Floor Applications



## About Masonite Beams

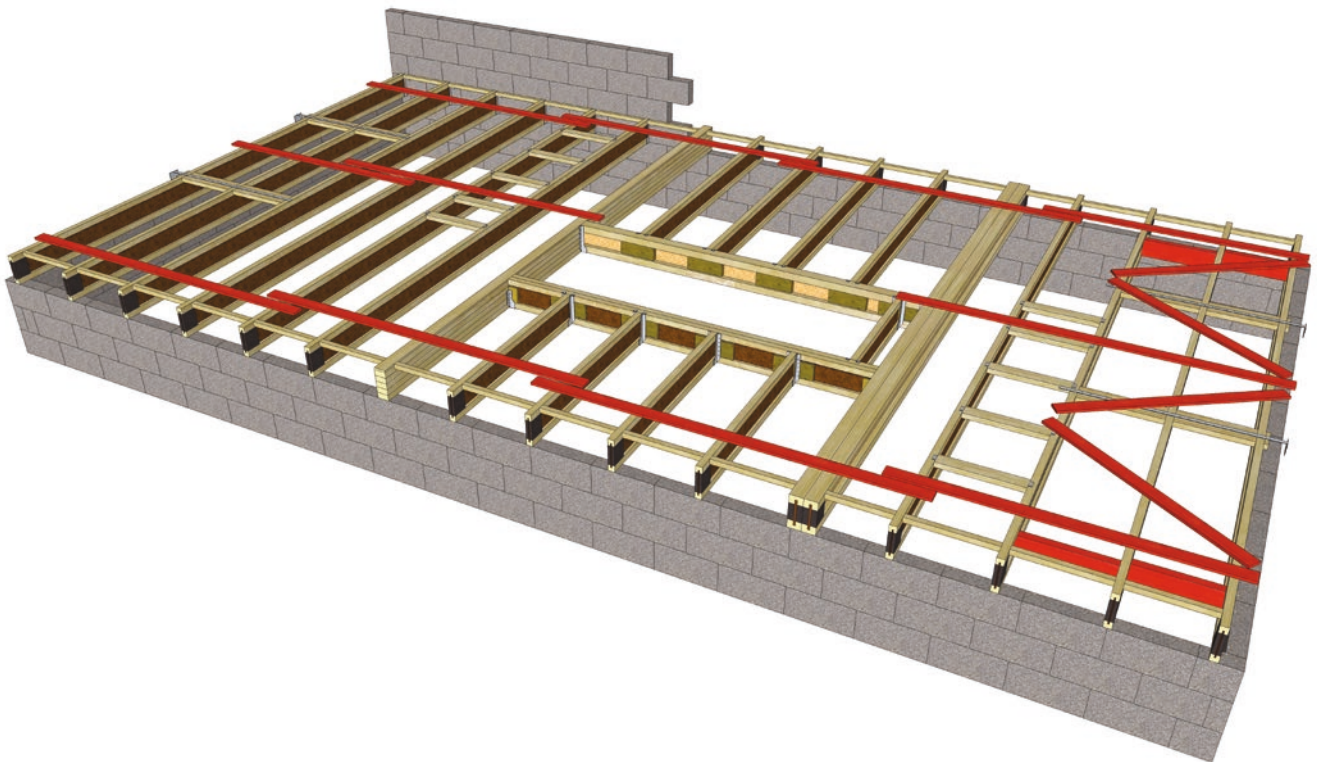
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Masonite Beams AB has been a pioneer of European based I-Joist manufacturing since 1974 and operates from its original location in Rundvik, Sweden.

In 2006 the company was bought by the Byggma Group, a Norwegian building products manufacturing group as part of a strategic move to strengthen its structural products portfolio. The group is comprised of 6 brands.

Its commitment to manufacturing was further underlined in 2008. After 4 years of research and development and an investment programme of £8m, the company opened a new 'state-of-the-art' I-Joist manufacturing plant with a production capacity of 24 million linear metres per year.





## Environmental Credentials

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In today's construction industry, the issue of sustainability and minimising the impact on the environment are becoming increasingly important. Masonite operates a comprehensive environmental policy, which covers both the manufacture of its products and the sourcing of the raw materials used.

Manufactured in accordance with the environmental management system ISO 14001, Masonite I-Joists utilise wood fibre certified under PEFC with full chain of custody processes. The high efficiency of the 'wood to I-Joist' conversion process means that for a specific volume of Masonite I-Joists, far fewer trees are harvested than those required to produce an equivalent volume of solid sawn timber joists.



# Masonite I-Joists

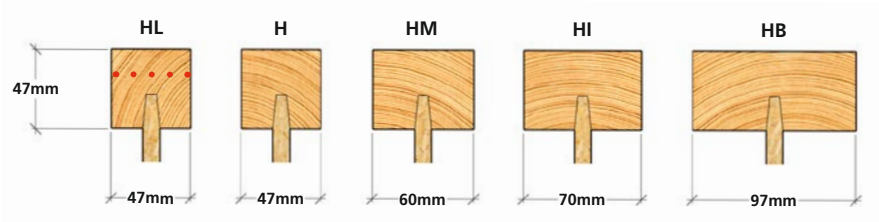
I-Joists are used as structural components in engineered timber floor, wall and roof systems. The majority of Masonite I-Joists are used as part of the Masonite Floor System.

The manufacturing facility in Sweden is supported by Södra in the UK with a first class, dedicated, experienced team handling sales, engineering and design, together with a comprehensive software package covering layout, engineering and cut optimisation.

Masonite I-Joists are a lightweight alternative to conventional timber members, offering time-saving and cost-saving solutions for floor, roof and wall construction to a wide range of private and public sector applications. Unlike traditional timber, which can warp, twist and shrink, Masonite I-Joists have a superior dimensional stability resulting in fewer costly site call-backs.

Masonite engineered timber I-Joists are comprised of slow-grown, high grade white wood flanges combined with OSB for the web. Masonite I-Joists carry the ETA certification and CE marking, together with PEFC chain of custody certification. Masonite I-Joists are manufactured in accordance with the requirements of ISO 9001 and the environmental standard ISO 14001. Masonite I-Joists are manufactured to a wide range of lengths to meet all structural requirements and are available in the following depths: 220mm, 240mm, 300mm, 350mm and 400mm.

**NOTE:**  
The HL Joist is identified by a RED dotted line on the flange.



| STANDARD DEPTHS mm | HL | H | HM | HI | HB |
|--------------------|----|---|----|----|----|
| 220                | ✓  | ✓ | ✓  | ✓  | ✓  |
| 240                | ✓  | ✓ | ✓  | ✓  | ✓  |
| 300                | ✓  | ✓ | ✓  | ✓  | ✓  |
| 350                |    |   | ✓  |    | ✓  |
| 400                |    |   | ✓  |    | ✓  |

## PRODUCT APPROVALS



## Masonite I-Joists

### DOMESTIC FLOORS – LOADSHARING (4 OR MORE JOISTS NO MORE THAN 610mm ON CENTRE) – SERVICE CLASS 1

| JOIST SERIES | DEPTH H mm | JOIST WEIGHT kg/m | FLEXURAL RIGIDITY EI N.mm <sup>2</sup> x10 <sup>9</sup> | SHEAR RIGIDITY GA Nx10 <sup>6</sup> | PERMISSIBLE RESISTANCES <sup>1)</sup> – DOMESTIC FLOORS – LOADSHARING <sup>2)</sup> |                   |                     |                              |
|--------------|------------|-------------------|---|-------------------------------------|---|-------------------|---------------------|------------------------------|
|              |            |                   |   |                                     | BENDING MOMENT <sup>3)</sup> kN.m   | Vertical Shear kN | 45mm END BEARING kN | 89mm INTERMEDIATE BEARING kN |
|              |            |                   |   |                                     |   |                   | NO WEB STIFFENERS   | NO WEB STIFFENERS            |
| HL           | 220        | 2.99              | 303   | 1.253                               | 2.14  | 5.54              | 4.03                | 10.13                        |
| HL           | 240        | 3.14              | 376   | 1.412                               | 2.39  | 6.04              | 4.03                | 10.13                        |
| HL           | 300        | 3.59              | 650   | 1.888                               | 3.13  | 7.53              | 4.03                | 10.13                        |
| H            | 220        | 3.23              | 431   | 1.253                               | 4.16  | 5.54              | 4.26                | 10.66                        |
| H            | 240        | 3.38              | 535   | 1.412                               | 4.64  | 6.04              | 4.26                | 10.66                        |
| H            | 300        | 3.83              | 920   | 1.888                               | 6.04  | 7.53              | 4.26                | 10.66                        |
| H            | 350        | 4.21              | 1327  | 2.286                               | 7.18  | 8.76              | 4.26                | 10.66                        |
| H            | 400        | 4.58              | 1813  | 2.683                               | 8.30  | 9.99              | 4.26                | 10.66                        |
| HM           | 220        | 3.84              | 553   | 1.253                               | 5.35  | 5.54              | 5.36                | 13.06                        |
| HM           | 240        | 3.99              | 686   | 1.412                               | 5.95  | 6.04              | 5.36                | 13.06                        |
| HM           | 300        | 4.44              | 1178  | 1.888                               | 7.72  | 7.53              | 5.36                | 13.06                        |
| HM           | 350        | 4.82              | 1694  | 2.286                               | 9.17  | 8.76              | 5.36                | 13.06                        |
| HM           | 400        | 5.19              | 2311  | 2.683                               | 10.58   | 9.99              | 5.36                | 13.06                        |
| HI           | 220        | 4.31              | 647   | 1.253                               | 6.26  | 5.54              | 6.16                | 13.33                        |
| HI           | 240        | 4.46              | 802   | 1.412                               | 6.96  | 6.04              | 6.16                | 13.33                        |
| HI           | 300        | 4.91              | 1375  | 1.888                               | 9.02  | 7.53              | 6.16                | 13.33                        |
| HI           | 350        | 5.29              | 1977  | 2.286                               | 10.69   | 8.76              | 6.16                | 13.33                        |
| HI           | 400        | 5.66              | 2694  | 2.683                               | 12.34   | 9.99              | 6.16                | 13.33                        |
| HB           | 220        | 5.58              | 900   | 1.253                               | 8.70  | 5.54              | 8.53                | 20.00                        |
| HB           | 240        | 5.73              | 1116  | 1.412                               | 9.67  | 6.04              | 8.53                | 20.00                        |
| HB           | 300        | 6.18              | 1909  | 1.888                               | 12.53   | 7.53              | 8.53                | 20.00                        |
| HB           | 350        | 6.56              | 2740  | 2.286                               | 14.82   | 8.76              | 8.53                | 20.00                        |
| HB           | 400        | 6.93              | 3728  | 2.683                               | 17.08   | 9.99              | 8.53                | 20.00                        |

#### NOTES:

- 1) Permissible resistances are for Long Term duration ( $K_s = 1.00$ ) and can be increased for duration of load using the appropriate  $K_s$  factor as defined in BS 5268-2.
- 2) Permissible resistances *have already been multiplied* by domestic floor adjustment factor  $K_{dom} = 1.12$  and loadsharing factor  $K_g = 1.10$ .
- 3) Permissible moments assume full lateral support of the compression flange. Full support is considered to be a maximum unbraced length of 350mm for HL or H series, 500mm for HM, 600mm for HI and 1000mm for HM series.

## I-Joist Span Chart

| DEPTH<br>mm | SERIES | 400mm ccs | 480mm ccs | 600mm ccs |
|-------------|--------|-----------|-----------|-----------|
| 220         | HL     | 4104      | 3864      | 3514      |
| 220         | H      | 4449      | 4239      | 3954      |
| 220         | HM     | 4711      | 4484      | 4219      |
| 220         | HI     | 4879      | 4639      | 4275      |
| 220         | HB     | 5249      | 4989      | 4689      |
| 240         | HL     | 4332      | 4128      | 3706      |
| 240         | H      | 4698      | 4472      | 4189      |
| 240         | HM     | 4971      | 4732      | 4451      |
| 240         | HI     | 5150      | 4900      | 4609      |
| 240         | HB     | 5542      | 5269      | 4950      |
| 300         | HL     | 4964      | 4713      | 4218      |
| 300         | H      | 5375      | 5102      | 4779      |
| 300         | HM     | 5690      | 5416      | 5078      |
| 300         | HI     | 5891      | 5607      | 5269      |
| 300         | HB     | 6340      | 6028      | 5664      |
| 350         | HM     | 6229      | 5920      | 5548      |
| 350         | HB     | 6939      | 6598      | 6199      |
| 400         | HM     | 6728      | 6387      | 5985      |
| 400         | HB     | 7493      | 7125      | 6694      |

### NOTES:

1. The maximum spans shown above are in metres and indicate the most restrictive single or multiple effective span applications.
2. The deflection restriction has been taken as the lesser of  $0.003 \times \text{Effective span}$  or 12mm in accordance with BS 5268.
3. The above table assumes load sharing i.e. joist are no more than 610mm centres.
4. Maximum spans assume that the joist flanges are adequately restrained laterally and that decking and ceiling are fixed to the joist in accordance with relevant British Standards.
5. Spans are calculated for the uniformly distributed loads indicated only. This figure allows for the dead load of a floor with a 22mm chipboard deck and 15mm plasterboard ceiling, an imposed loading of  $1.5\text{kN/m}^2$  (from BS 6399-1, for domestic floors) and a uniform allowance for lightweight partitions not exceeding  $0.8\text{kN/m}$  run. For other conditions, contact your Södra Wood representative.
6. Minimum 89mm end bearing is assumed.

# Glulam Beams

Glulam Beams are manufactured from 40mm laminations of Nordic Spruce to GL24H standard under EN14080.

Available in 12m lengths, Glulam Beams are the perfect complement to I-Joists as part of the Masonite Floor System.



| DEPTH<br>mm | 38mm | 45mm | 90mm | 140mm |
|-------------|------|------|------|-------|
| 220         | ✓    | ✓    | ✓    |       |
| 240         | ✓    | ✓    | ✓    | ✓     |
| 300         | ✓    | ✓    | ✓    | ✓     |
| 350         |      | ✓    |      |       |
| 400         |      | ✓    |      |       |

## Glulam Beam Material Properties

| BREADTH<br>mm | DEPTH<br>mm | AREA<br>mm <sup>2</sup> X 10 <sup>3</sup> | SECTION<br>MODULUS<br>mm <sup>3</sup> X 10 <sup>6</sup> | MOMENT OF<br>INERTIA<br>mm <sup>4</sup> X 10 <sup>9</sup> | MR<br>kNm | MAX SHEAR<br>kN | EL<br>Nmm <sup>2</sup> X 10 <sup>9</sup> | WEIGHT kg/m |
|---------------|-------------|---|---|---|-----------|-----------------|--|-------------|
| 38            | 220         | 8.36                                      | 0.307   | 0.034   | 3.247     | 9.260           | 389.65                                   | 3.51        |
| 45            | 220         | 9.90                                      | 0.363   | 0.040   | 3.845     | 10.965          | 461.43                                   | 4.16        |
| 90            | 220         | 19.80                                     | 0.726   | 0.080   | 7.690     | 21.930          | 922.86                                   | 8.32        |
| 38            | 240         | 9.12                                      | 0.365   | 0.044   | 3.827     | 10.101          | 505.88                                   | 3.83        |
| 45            | 240         | 10.80                                     | 0.432   | 0.052   | 4.532     | 11.962          | 599.06                                   | 4.54        |
| 90            | 240         | 21.60                                     | 0.864   | 0.104   | 9.065     | 23.924          | 1198.13                                  | 9.07        |
| 140           | 240         | 33.60                                     | 1.344   | 0.161   | 14.101    | 37.215          | 1863.75                                  | 14.11       |
| 38            | 300         | 11.40                                     | 0.570   | 0.086   | 5.985     | 12.627          | 988.04                                   | 4.79        |
| 45            | 300         | 13.50                                     | 0.675   | 0.101   | 7.088     | 14.953          | 1170.05                                  | 5.67        |
| 90            | 300         | 27.00                                     | 1.350   | 0.203   | 14.175    | 29.905          | 2340.09                                  | 11.34       |
| 140           | 300         | 42.00                                     | 2.100   | 0.315   | 22.050    | 46.519          | 3640.14                                  | 17.64       |
| 45            | 350         | 15.75                                     | 0.919   | 0.161   | 9.428     | 17.445          | 1857.99                                  | 6.62        |
| 45            | 400         | 18.00                                     | 1.200   | 0.240   | 12.047    | 19.937          | 2773.44                                  | 7.56        |

### Notes:

1. Properties of horizontally laminated beams are calculated in accordance with BS5268-2, assuming 40mm laminates. Grade stresses are modified for number of laminates and beam depth but not load duration.
2. Design properties are for long term loading without load sharing.
3. Values apply only if lateral support of the compression edge is provided at not more than 600mm centres.
4. These values apply only to dry use conditions - i.e. SC1 and SC2.

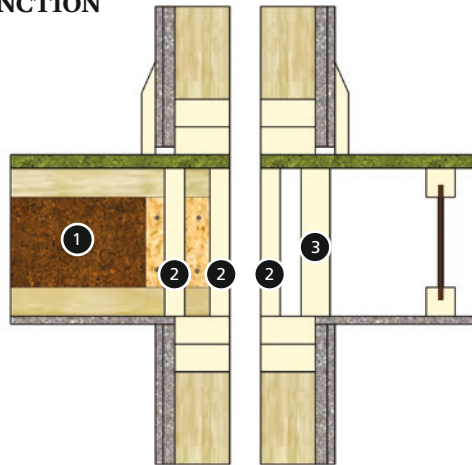


## Intermediate Floors

### TIMBER FRAME PARTY WALL JUNCTION

Floor specifications to provide airborne sound reduction  $R_w \geq 40\text{dB}$  (with deck adhesive system) and fire resistance  $\geq 30$  minutes (EN1365 Part2/3)

- 1 Plywood/OSB web filler blocks cut to fit between flanges, thickness to suit flange size, fitted both sides
- 2 38mm glulam
- 3 45mm glulam to carry plasterboard



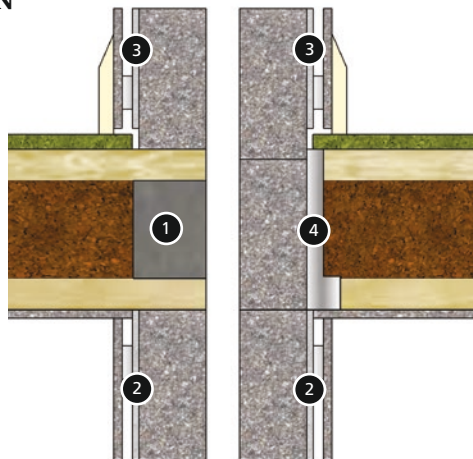
#### Notes:

These details meet the requirements of Robust Details E-WT-1 and E-WT-2, for timber separating walls.

### MASONRY PARTY WALL JUNCTION

Floor specifications to provide airborne sound reduction  $R_w \geq 40\text{dB}$  (with deck adhesive system and fire resistance  $\geq 30$  minutes (EN1365 Part2/3)

- 1 Effectively seal the joist end with web stiffeners and sealant or a proprietary cap
- 2 Continuous horizontal ribbon of adhesive
- 3 Render
- 4 Masonry Hanger



#### Notes:

Junction details meet the requirements of Robust Details E-WM-1 to 8 inclusive, for masonry separating walls.

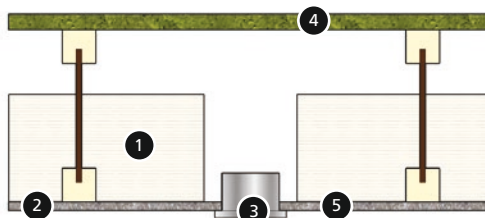
Illustration: concrete blocks, render and gypsum-based boards on dabs (E-WM-3, 4, 6 & 7).

Only use with masonry wall specifications in Part E Robust Details.

### STANDARD INTERMEDIATE FLOOR

Floor specifications to provide airborne sound reduction  $R_w \geq 40\text{dB}$  (with deck adhesive system) and fire resistance  $\geq 30$  minutes (EN1365 Part2/3)

- 1 Optional fitment of insulation
- 2 Fix ceiling lining in accordance with the plasterboard manufacturer's instructions
- 3 Optional fitment of recessed light fittings. (These must have been assessed for 60 minutes fire resistance)
- 4 22mm flooring-grade chipboard
- 5 15mm standard wallboard



#### Notes:

Perimeter noggins may not be required for 15mm plasterboard ceilings, refer to manufacturer

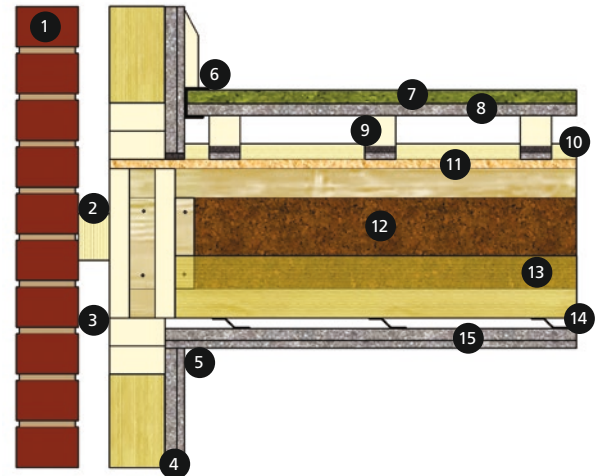
Insulation (density 10–33 Kg/m<sup>3</sup>) may be required for sound insulation where alternative deck and ceiling constructions are used.

Insulation may be added to improve sound resistance.

# Separating Floors

## TIMBER FRAME EXTERNAL WALL JUNCTION

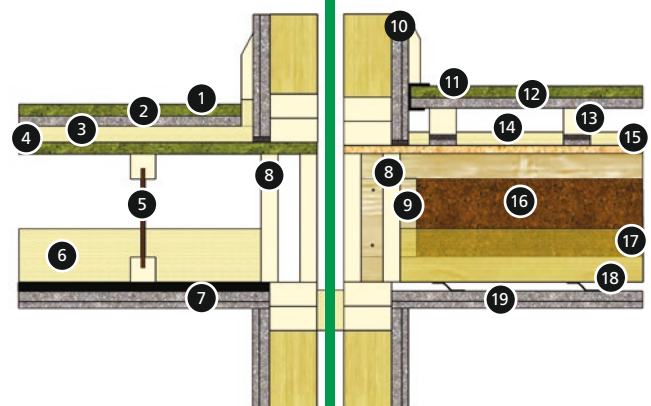
- |   |  |
|---|--|
| 1 Masonry outer leaf  | 9 Resilient batten   |
| 2 Cavity stop   | 10 Mineral wool laid between battens   |
| 3 Min. 50mm external wall cavity  | 11 15mm OSB subdeck  |
| 4 2 layers of gypsum-based board, nominal weight of 8 kg/m <sup>2</sup> per layer | 12 Min. 240mm Masonite I-Joist   |
| 5 Seal with tape or caulk with sealant  | 13 Min. 100mm mineral fibre cased quilt (10-33 kg/m <sup>3</sup> )                               |
| 6 Min. 5mm foamed polyethylene resilient flanking strip                           | 14 Resilient bar   |
| 7 Min. 18mm T&G flooring board  | 15 2 layers of gypsum-based board, combined weight of 23kg/m <sup>2</sup> , all joints staggered |
| 8 Gypsum based board (13.5kg/m <sup>2</sup> )                                     |  |



## TIMBER SEPARATING WALL JUNCTION

This is NOT a Robust Detail and therefore will be subject to Pre-Completion Testing (PCT) in England and Wales.

- |  |  |
|--|--|
| 1 22mm Chipboard flooring  | 10 2 layers of gypsum-based board, total nominal weight of 22 kg/m <sup>2</sup> both sides       |
| 2 Gypsum based board (13.5kg/m <sup>2</sup> )  | 11 Min. 18mm T&G flooring board  |
| 3 0mm thick mineral fibre (140 kg/m <sup>3</sup> )   | 12 Gypsum based board (13.5kg/m <sup>2</sup> )   |
| 4 22mm Chipboard flooring  | 13 Resilient batten  |
| 5 Min. 240mm Masonite I-Joist  | 14 Mineral wool laid between battens   |
| 6 Min. 100mm mineral fibre cased quilt (10-33 kg/m <sup>3</sup> )  | 15 15mm OSB subdeck  |
| 7 Resilient bar  | 16 Min. 240mm Masonite I-Joist   |
| 8 Requirements for intermediate floors, rim board, perimeter joists and blocking apply                       | 17 Min. 100mm mineral fibre cased quilt (10-33 kg/m <sup>3</sup> )                               |
| 9 Plywood/OSB web filler blocks cut to fit between flanges, thickness to suit flange size, fitted both sides | 18 2 layers of gypsum-based board, combined weight of 23kg/m <sup>2</sup> , all joints staggered |

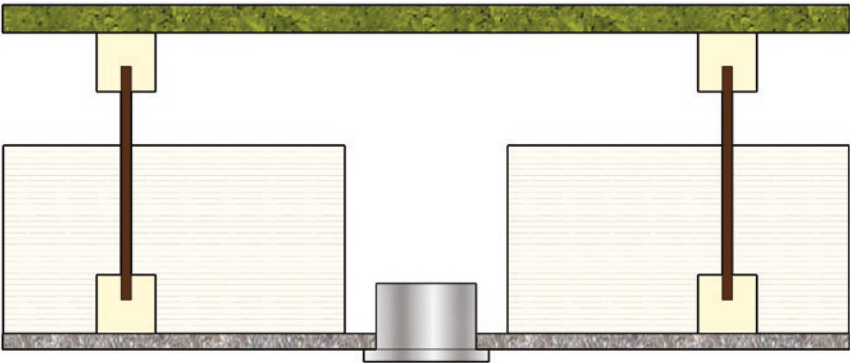


Part E Robust Details E-FT-1 (timber I-Joists) and E-WT1 (twin timber frames without sheathing board). Refer to Robust Details Part E handbook for detailed specifications.

# Other Floor Information

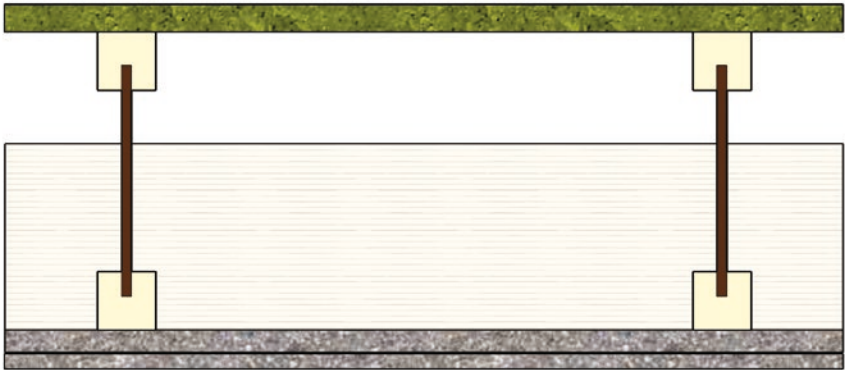
## FIRE RESISTANCE

### Full 30 minutes



| DECKING        | JOIST CENTRES      | INSULATION                               | PLASTERBOARD                                    |
|----------------|--------------------|--|---|
| 22mm Chipboard | 400, 480 and 600mm | Optional max density 35kg/m <sup>3</sup> | 15mm standard wallboard of Gyproc or equivalent |

### Full 60 minutes



| DECKING        | JOIST CENTRES      | INSULATION                               | PLASTERBOARD  |
|----------------|--------------------|--|---|
| 22mm Chipboard | 400, 480 and 600mm | Optional max density 35kg/m <sup>3</sup> | 15mm fire resistant board with 12.5mm standard wallboard over of Gyproc or equivalent |

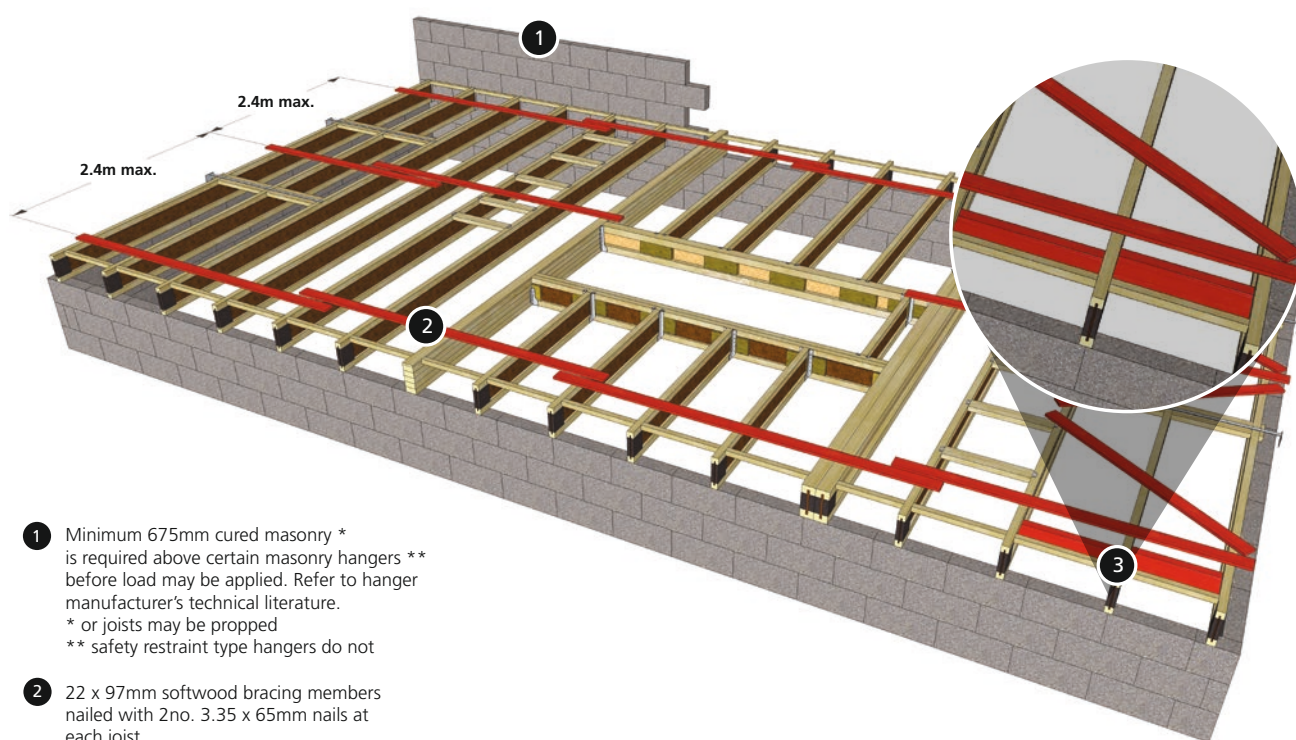
The char rate of glulam beams is as per table 3.1 of EN 1995-1-2 (Eurocode 5.Part 1.2) at 0.65mm/min

## Safety Bracing Details

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### UNBRACED JOISTS ARE UNSTABLE!

- Do not walk on or apply any materials to the joist area until the floor system is properly braced.
- The bracing should be removed in sequence as the decking is installed.
- The following represents a generic method of bracing a floor. Each system will be slightly different and the installer must ensure that all sections of the floor are accounted for.



- 1 Minimum 675mm cured masonry \* is required above certain masonry hangers \*\* before load may be applied. Refer to hanger manufacturer's technical literature.  
\* or joists may be propped  
\*\* safety restraint type hangers do not
- 2 22 x 97mm softwood bracing members nailed with 2no. 3.35 x 65mm nails at each joist.
- 3 38 x 125mm timber stability blocks to be fixed between at least 3 joists, covering at least 1.2m in length. Nail with at least 2no. 3.35 x 65mm nails each end.

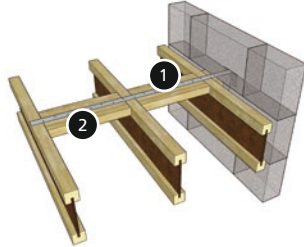
### Notes:

- Full depth I-joist blocking panels may be used instead of solid timber stability blocks.
- All blocks to be cut accurately and squarely to maintain spacing of joists.
- Additional blocks and bracings are required for any areas of joists running in opposite directions and for cantilevered joists (unless permanent closure piece is installed at this stage). Install further sets of blocks and diagonals at a maximum of 12m centres in long runs of joists.



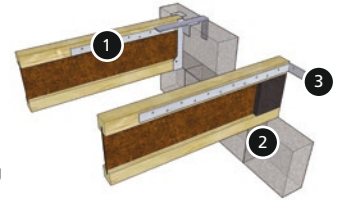
## A1 MASONRY WALL RESTRAINT – PERPENDICULAR TO JOIST

- 1 Thin metal restraint strap installed in accordance with the manufacturer's instructions
- 2 Min. 38 x 97mm nogging fixed to joists by skew nails



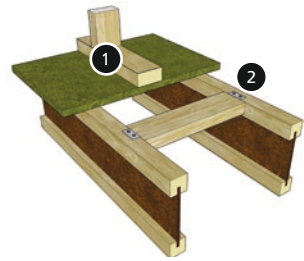
## A2 MASONRY WALL RESTRAINT – PARALLEL TO JOIST

- 1 Restraint strap fitted to joist on non-restraint type masonry hanger
- 2 Parallel restraint straps may only be omitted if the joist has at least 90mm of direct bearing on the wall, provided that the height of the wall does not exceed 2 storeys
- 3 Restraint strap on built-in joist



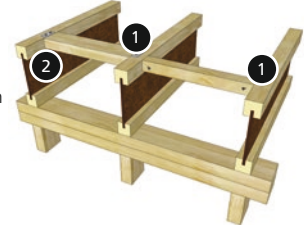
## A3 PARALLEL PARTITION NOGGINGS

- 1 Non-load bearing stud partition fixed to noggings (max. self-weight of partition 0.8kN/m run)
  - 2 38 x 75mm partition noggings supported by metal z-clips, nailed in accordance with the manufacturer's instructions
- i Noggings may also be attached with 2no. 3.35 x 65mm nails skew nailed at each end



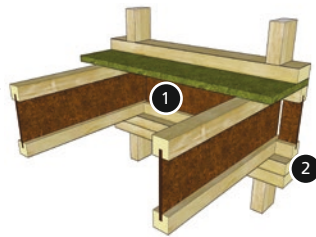
## A4 PERIMETER NOGGINGS

- 1 Noggings may be skew nailed to joists or supported on z-clips
- 2 Timber noggings fitted between joists to support free edges of decking at external or internal walls. Also applicable to masonry walls



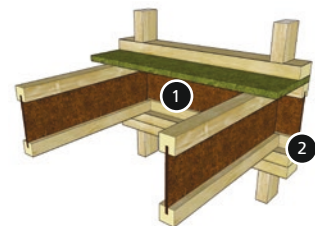
## B1 I-JOIST BLOCKING PANEL

- 1 Masonite I-Joist blocking panel
- 2 Joist has full bearing on timber plate



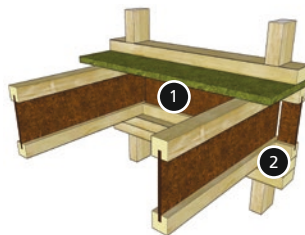
## B2 RIM I-JOIST

- 1 Masonite I-Joist rim board
- 2 Joist requires 45mm minimum bearing



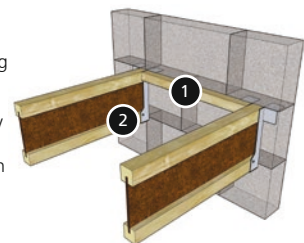
## B3 RIM BOARD

- 1 38mm Glulam
- 2 Joist requires 45mm minimum bearing



## B4 MASONRY HANGER

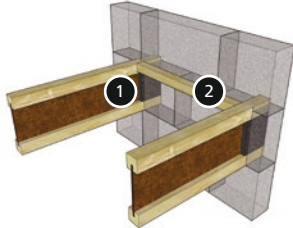
- 1 Perimeter nogging for decking support where required
  - 2 Proprietary approved masonry joist hangers - web stiffeners may be required, see notes on page 16
- i Parallel restraint straps will be required with non-restraining hangers — see A2





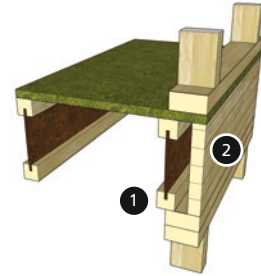
### B5 MASONRY WALL BEARING

- 1 Joist end built into wall. Note some capping devices may require less than a full bearing to prevent fouling the cavity
  - 2 Perimeter noggings
- i** The joist bearing must be sealed to prevent air leakage. This may be achieved by the use of proprietary capping devices or end blocks fitted to the joist webs with sealant around the joist ends



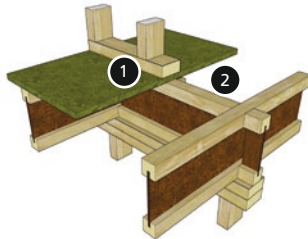
### B6 PARALLEL TIMBER FRAME WALL

- 1 Masonite I-Joist with half bearing into wall
- 2 Rim board to suit wall load



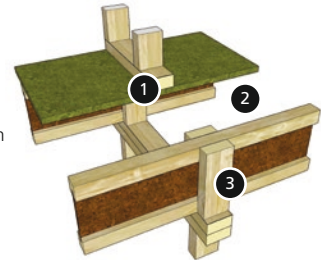
### B7 INTERMEDIATE BEARING – LOAD BEARING WALL ABOVE

- 1 Load bearing wall directly above wall below
- 2 Masonite I-Joist blocking panels between joists



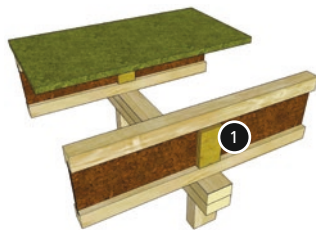
### B8 INTERMEDIATE BEARING – COMPRESSION BLOCKS

- 1 Load bearing wall directly above wall below
- 2 Height of compression blocks = joist depth + 2mm
- 3 38 x 89mm minimum softwood compression blocks



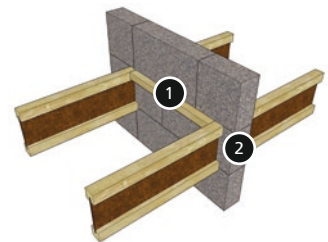
### B9 INTERMEDIATE BEARING – NO LOAD BEARING WALL ABOVE

- 1 Web stiffeners where required



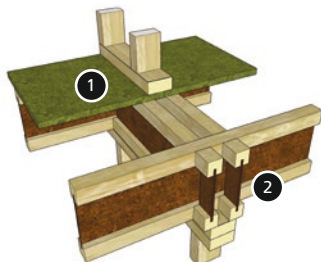
### B10 INTERMEDIATE BEARING – MASONRY WALL

- 1 Perimeter nogging
- 2 Minimum 89mm bearing



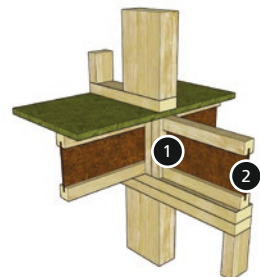
### B11 INTERMEDIATE BEARING – DOUBLE BLOCKING

- 1 Load bearing wall directly above wall below
- 2 Webs of blocking in line with edge of stud wall above and below



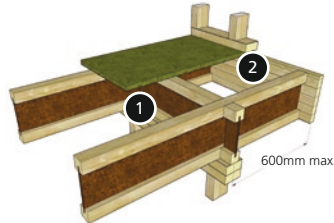
### B12 COLUMN WITH COMPRESSION BLOCKS

- 1 Softwood compression blocks, min. 38 x 89mm, height = joist depth + 2mm
  - 2 I-Joist blocking panels
- i** Number of blocks to suit width of column above



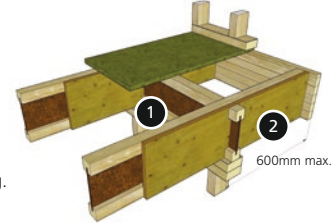
## B13 CANTILEVER SUPPORTING WALL

- 1 I-Joist Blocking
- 2 38mm Glulam
- i Structural cantilever must not exceed 600mm



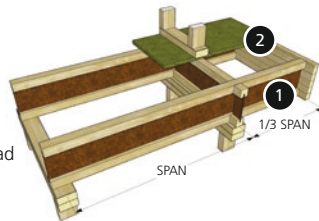
## B14 REINFORCED CANTILEVER SUPPORTING WALL

- 1 I-Joist Blocking
- 2 19mm ply reinforcement one or both sides of cantilevered joists, (determined by loading) nailed at 150mm centres with 3.35mm dia. nails, 65mm long. Stagger nails when fixing ply both sides
- i Structural cantilever must not exceed 600mm



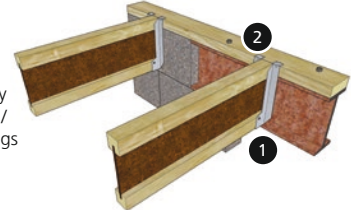
## B15 NON LOAD BEARING CANTILEVER

- 1 I-Joist Blocking
- 2 38mm Glulam
- i Max. cantilever length is 1200mm. No load applied on cantilever



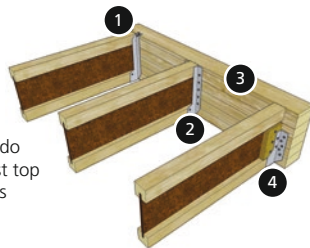
## B16 WALLPLATE CONNECTION

- 1 Top mount hangers
- 2 Timber bearing plate securely fixed to flange of steel beam/masonry wall (design of fixings by Building Designer)



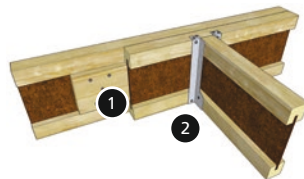
## C1 I-JOIST TO SOLID BEAM CONNECTION

- 1 Top mount hanger
- 2 Face mount hanger
- 3 Glulam beam
- 4 Face mount hangers which do not laterally support the joist top flange require web stiffeners



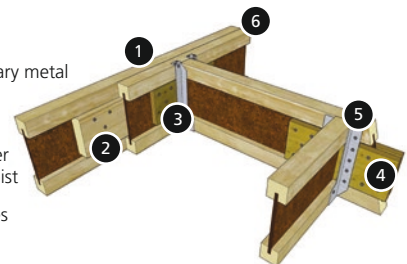
## C3 I-JOIST TO I-JOIST CONNECTION –BACKERLESS

- 1 Filler block or proprietary metal clips must still be installed with multiple joists
- 2 Approved hanger designed for use without backer blocks



## C2 I-JOIST TO I-JOIST CONNECTION

- 1 Top mount hanger
- 2 Filler block or proprietary metal clips must be installed with multiple joists
- 3 Backer block on hanger face only for double joist
- 4 Backer block both sides of single joist
- 5 Face mount hanger
- 6 Double I-Joist
- i Backer blocks nailed with 10no. 3.75mm diameter nails x 75mm long, with ends clinched if possible.



For top mount hangers, backer block tight to top flange of joist.

For face mount hangers, backer block tight to bottom flange.

Filler blocks fitted tight to top flange.

Use 10no. 4.00mm nails x 90mm long, for HB joists.

See table on page 16 for size of backer.

Note that approved hangers which eliminate the need for backer blocks are available. See detail C3.

## Joist Accessories

### FILLER AND BACKER BLOCK SIZES

The length of backer and filler blocks should allow fitment of nails without splitting and are typically 300-600mm long.

| DEPTH<br>mm      | 220      |     |     |     | 240      |     |     |     | 300      |     |     |     | 350 |     | 400 |     |
|------------------|----------|-----|-----|-----|----------|-----|-----|-----|----------|-----|-----|-----|-----|-----|-----|-----|
| SERIES           | HL/<br>H | HM  | HI  | HB  | HL/<br>H | HM  | HI  | HB  | HL/<br>H | HM  | HI  | HB  | HM  | HB  | HM  | HB  |
| Block Height     | 120      | 120 | 120 | 120 | 140      | 140 | 140 | 140 | 200      | 200 | 200 | 200 | 250 | 250 | 300 | 300 |
| Backer Thickness | 18       | 25  | 30  | 44  | 18       | 25  | 30  | 44  | 18       | 25  | 30  | 44  | 25  | 44  | 25  | 44  |
| Filler Thickness | 36       | 50  | 60  | 88  | 36       | 50  | 60  | 88  | 36       | 50  | 60  | 88  | 50  | 88  | 50  | 88  |

### WEB STIFFENER SIZES

| DEPTH<br>mm | 220         |             |             |             | 240         |             |             |             | 300         |             |             |             | 350         |             | 400         |             |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| SERIES      | HL/<br>H    | HM          | HI          | HB          | HL/<br>H    | HM          | HI          | HB          | HL/<br>H    | HM          | HI          | HB          | HM          | HB          | HM          | HB          |
| Height      | 120         | 120         | 120         | 120         | 140         | 140         | 140         | 140         | 200         | 200         | 200         | 200         | 250         | 250         | 300         | 300         |
| Thickness   | 18          | 25          | 30          | 44          | 18          | 25          | 30          | 44          | 18          | 25          | 30          | 44          | 25          | 44          | 25          | 44          |
| Nails       | 3no<br>65mm | 3no<br>65mm | 3no<br>65mm | 3no<br>90mm | 3no<br>65mm | 3no<br>65mm | 3no<br>65mm | 3no<br>90mm | 3no<br>65mm | 3no<br>65mm | 3no<br>65mm | 3no<br>90mm | 3no<br>65mm | 3no<br>90mm | 3no<br>65mm | 3no<br>90mm |



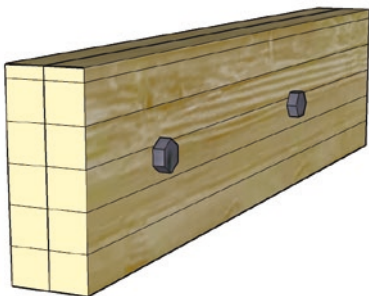
#### WEB STIFFENERS ARE REQUIRED IN THE FOLLOWING CASES:

- When a higher reaction value is needed at an internal support, refer to Engineering Support for more information.
- If the sides of the hanger do not laterally support the I-Joist top flange.
- When a concentrated load is transferred from above, the web stiffeners should be tight to the top flange (gap at bottom flange).

## MULTIPLE PLY GLULAM MEMBERS - FIXING DETAILS

Allowable uniform load applied to multiple glulam beam kN/m

| FIXINGS  | PLY THICKNESS |       |       |               |       |               |       |
|--|---------------|-------|-------|---------------|-------|---------------|-------|
|  | 2 PLY MEMBERS |       |       | 3 PLY MEMBERS |       | 4 PLY MEMBERS |       |
|  | 38mm          | 45mm  | 90mm  | 38mm          | 45mm  | 38mm          | 45mm  |
| 2 rows 3.00mm x 75mm long nails at 300mm centres | 4.34          | 4.34  | –     | 3.24          | 3.24  | –             | –     |
| 3 rows 3.00mm x 75mm long nails at 300mm centres | 6.51          | 6.51  | –     | 4.86          | 4.86  | –             | –     |
| 2 rows M12 bolts at 600mm centres                | 9.46          | 11.20 | 19.66 | 7.06          | 8.36  | 6.31          | 7.47  |
| 2 rows M12 bolts at 300mm centres                | 18.92         | 22.40 | 39.32 | 14.12         | 16.72 | 12.62         | 14.94 |



### Notes:

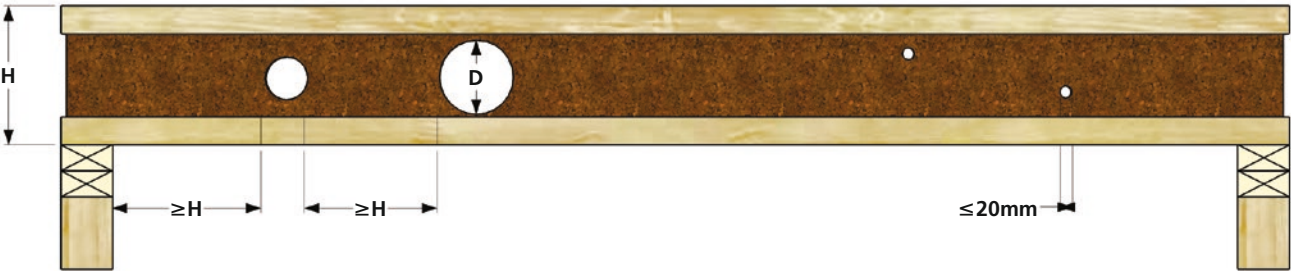
1. Verify adequacy of beam to support applied loads.
2. Beams wider than 180mm require special consideration.
3. For 3 and 4 member assemblies nails should be driven from both sides into the centre piece.
4. Nails to be fixed 50mm from the edges & ends of the beam.
5. Bolts to be installed 75mm from the edge and 50mm from the ends of the beam.
6. All bolts to be fitted with steel washers, minimum 36mm diameter x 3mm thick.
7. All loads are assumed to be applied perpendicular to the grain on one face only.
8. Values apply to beams in service classes 1 and 2 only.

**Table showing the maximum uniform load which can be applied to one face of composite glulam beams.**

# Allowable Holes

## I-JOISTS

Location of holes must be in agreement with the figure below. All large holes must be located on the centre-line of the beam web. Restrictions apply to holes exceeding 20mm in size. Holes up to 20mm in diameter can be located anywhere in the web but with at least 40mm between hole edges and at least H away from a larger hole.

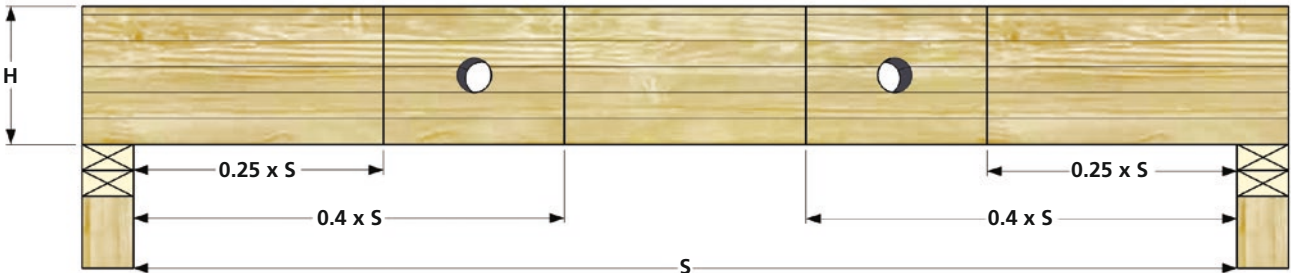


| DEPTH<br>mm                | 220      |     |    |    | 240      |     |    |    | 300      |     |    |    | 350 |     | 400 |     |
|----------------------------|----------|-----|----|----|----------|-----|----|----|----------|-----|----|----|-----|-----|-----|-----|
| SERIES                     | HL/<br>H | HM  | HI | HB | HL/<br>H | HM  | HI | HB | HL/<br>H | HM  | HI | HB | HM  | HB  | HM  | HB  |
| Distance to Hole<br>mm     |          | 220 |    |    |          | 240 |    |    |          | 300 |    |    |     | 350 |     | 400 |
| Max Hole Size<br>mm        |          | 126 |    |    |          | 146 |    |    |          | 206 |    |    |     | 256 |     | 306 |
| Min between<br>Holes<br>mm |          | 220 |    |    |          | 240 |    |    |          | 300 |    |    |     | 350 |     | 400 |

Table applies only to uniformly loaded beams

## GLULAM BEAMS

Holes must be drilled on the neutral axis, with a diameter not exceeding 0.25 x depth of Beam, not less than 3 diameters apart, located between 0.25 and 0.4 of the span from the support. Please contact Engineering Support if you have a specific requirement.





# Product Handling

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## THESE CONDITIONS ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES

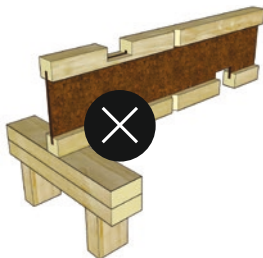
If in doubt, please ask for advice before you cut.

### NO holes close to joist ends

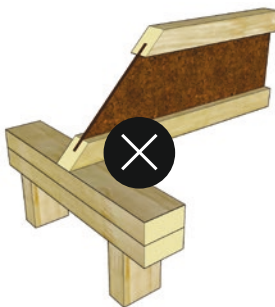
Use hole chart for max. size & min. distance to wall.



### NO notches in flanges of Masonite joists



### NO bevel cuts beyond the inside face of wall



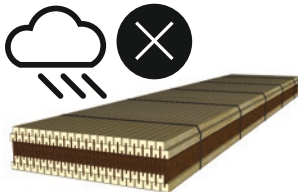
### NO notches or holes in Glulam

Except as advised in hole chart for the product.

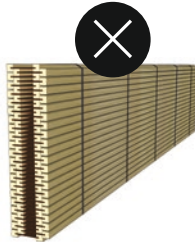


### Storage

Always store joist packs flat, properly covered and above the ground.

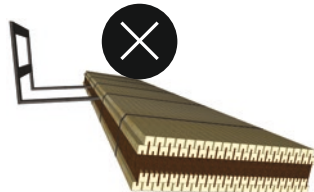


Never store joist packs vertically.



### Handling

Never lift or move the joist packs by the flanges.



Always follow the HSE guidance on manual handling.



BS5268 Version

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