



Design instructions

Issue 2



A photograph of a dense forest of tall, thin evergreen trees. Sunlight filters through the canopy, creating dappled light on the forest floor. The ground is covered in green undergrowth and fallen branches. The text "Build more with less" is overlaid in the center.

Build more
with less

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At our factory in Rundvik, we are developing the building systems of the future in accordance with northern Swedish traditions. With Masonite Beams, you are choosing a well-developed building system where the strength comes from within. For people who want to build light, strong and effective.

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Masonite Beams' standard range of lightweight I-joists consists of structurally glued I-joist, studs and sills. Masonite Beams offers pre-cut I-joist that simplify construction, reduce waste and deliver high quality industrial production.

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Quick-mounted floor structures with even results. Easy to cut holes in. No creaking floors. High soundproofing. These are some of the advantages of floor structures built with Masonite Beams' building systems.

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The I-joist's small thermal bridges in the walls reduce heat losses by 57 percent. As a result, the total energy consumption of a building can be reduced by five to nine percent compared to traditional solid studs.

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Heavy snow loads are not a problem with roof I-joist from Masonite Beams. Thanks to the joist height of 500 mm, the joist can cope with large spans. It is also cost-effective for well-insulated structures. This makes the I-joist suitable for low-energy and passive house buildings.

Details, fire & acoustics 43

With Masonite Beams, you can build high-quality acoustic environments while at the same time enjoying good protection from fire. Here you will find all the building details you need to maximise Masonite Beams' capacity and build a high-quality structure.

Masonite Beams' Design Instructions are a climate-compensated and Nordic Ecolabelled publication, printed on FSC-certified paper.



Svanenmärkt trycksak, 3041 0001



member of

BYGGMA
group

Masonite Beams is part of the Byggma Group.
Read more at masonitebeams.se

Strength comes from within

Houses built of wood have been withstanding the elements for hundreds of years. With Masonite Beams' building systems, the strength comes from within. The strength of the building system is its ability to handle long spans, in the sound reduction and easy installation.

In Rundvik in Northern Sweden, we are developing the building systems of the future. With Masonite Beams, you are choosing a well-developed building system where the strength comes from within. For people who want to light, strong and effective.

Thank you for choosing Masonite Beams!





Building in wood is the future!

Many years of research and collaboration with technical consultants and universities have given rise to our high-quality I-joist. Using our building system, you get quiet properties that deliver high performance,

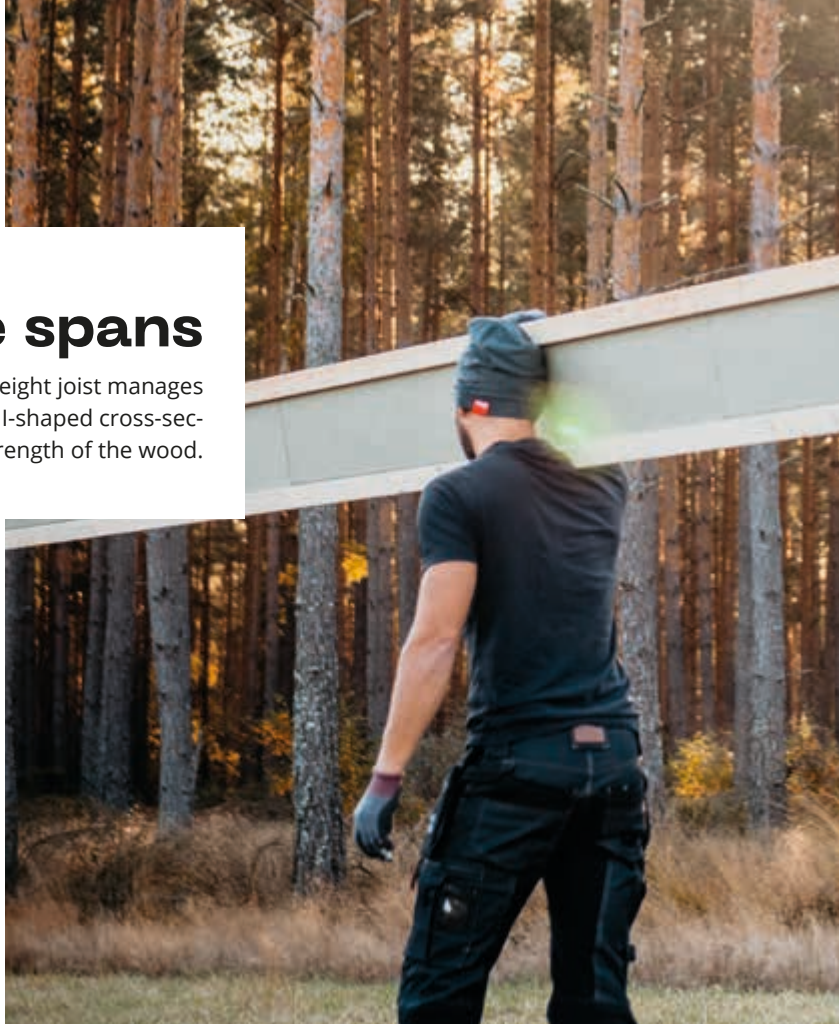


Quiet buildings

Noise and unwanted sound negatively affect people. Therefore, acoustic requirements need to be planned early in the design phase. Masonite Beams' well-engineered building system consists of smart components and structural details designed to attenuate sound. Consequently, the building system is well suited for properties with high demands on acoustics and sound insulation.

Large spans

Despite its light weight, our lightweight joist manages long spans. This is thanks to the I-shaped cross-section, which efficiently utilizes the strength of the wood.



Lightweight choice

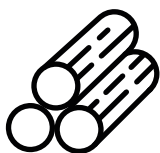
The Masonite Beams construction concept is developed for efficient material use. According to our calculations, our beams use 47 percent* less raw material than equivalent solid timber beams. Pre-cut beams are delivered in flat packs, which can contribute to reduced waste during installation and more efficient transport.

*Read more at masonitebeams.com



Building solutions for homes to thrive in

We actively work to develop our products and processes. In our operations, we focus on areas such as material usage, resource efficiency, and energy efficiency. We create solutions for homes where people thrive. See more at masonitebeams.com.



Raw material

Masonite Beams is certified in accordance with FSC® Chain of Custody and PEFC Chain of Custody. Certified products can be supplied upon request and are labeled according to applicable certification requirements.

The majority of the raw material for our I-joists comes from sawmills in northern Sweden that supply timber according to our specified quality requirements. Particleboard web materials originate from Scandinavia and OSB from northern Europe.



Production

As one of Europe's leading producers of I-joists, we have placed a strong focus on creating a highly energy-efficient manufacturing process. We continuously work to reduce production waste, while the residual products generated are used to produce bioenergy.

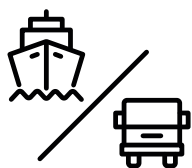
Our ISO 14001-certified environmental management system supports systematic environmental work and continuous operational improvements.



Housing

Through our I-joist profile, we use approximately 47%* less wood raw material is used compared to a traditional structural timber beam. A frame built with our I-joists provides up to a 57%* reduction in thermal bridges, a 14% lower U-value, and a 5–9%* reduction in total energy consumption compared to a traditional timber stud frame.

See sources at masonitebeams.com



Logistics

Our goal is to utilize efficient transport and optimize our packaging. By packaging efficiently, we deliver higher volume at a lower weight compared to solid alternatives.



Construction

Environmental data for our products is declared in a third-party verified Environmental Product Declaration (EPD). Furthermore, the low weight of the I-joist reduces the need for large cranes on the construction site, while our building system enables a fast and cost-effective construction process.



Owning and managing

We consider the whole picture, for example regarding energy and dimensional stability. This results in a building that is economical to own and manage, while increasing the value of the property. Advantages of using I-joists in the structural frame from a property management perspective include:

- **Energy saving:** smaller thermal bridges and well insulated
- **Dimensional stability:** no cracks, creaking floors or finishing work
- **Good acoustics**



Tradition from Rundvik in northern Sweden

Masonite Beams' factory in Rundvik benefits from solid traditions and extensive knowledge of creating strong, lightweight and durable building systems with I-joists. We are proud of this.

Together, we have developed a building system for single family houses, schools, extensions and multi family houses. The I-joists can be used in floor structures, roofs and walls.

In our lab, we conduct a number of tests in order to remain at the forefront in terms of quality.

The I-joist is one of the products that satisfy the high energy requirements that customers demand.

In order to save time and money at the workplace, Masonite Beams delivers customised I-joist directly from the factory.





You can build the following using Masonite Beams Building Concept:

BUILDING CONCEPT BUILDING SYSTEM					
	Single family houses	Multi family houses	Extensions	Schools	Commercial buildings
 On site					
 Plan elements					
 Volume or modular					

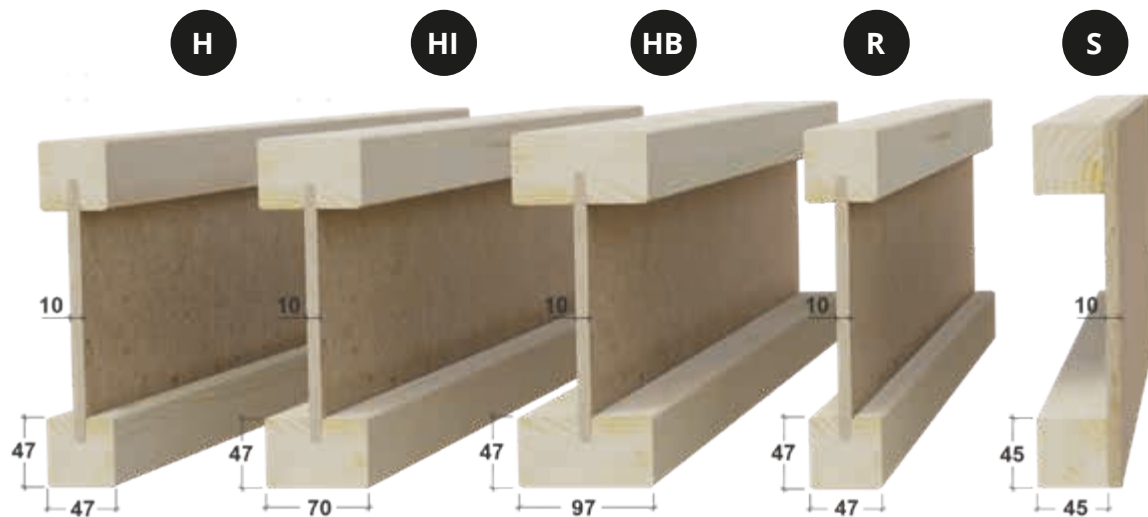


Welcome to our **design** **instruction**



Standard range

Masonite Beams' standard range consists of structurally glued I-joist, studs and sills. The flanges for I-joist and studs consist of machine-sorted construction graded wood, while the web is made of a moisture-resistant 10 mm particle board of P5 quality. Special lengths to achieve length optimisation can be supplied according to customer wishes. Special dimensions can also be manufactured for large projects and long production runs.



Dimensions & weight					
	Type H	Type HI	Type HB	Type R	Type S
A Height (mm)	200–500	200–500	250–500	200–400	200–400
B Width flange (mm)	47	70	97	47	45 or 70
C Thickness flange (mm)	47	47	47	47	45
D Thickness web (mm)	10	10	10	10	10
Lumber quality	C30	C30	C30	C18	C18
Weight (kg/m)	2.9–5.2	3.9–6.2	5.5–7.4	2.6–4.1	3.2–4.4

Product benefits



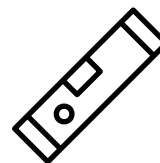
Customised

We customise as much as possible, thereby enabling you to save time at the construction site.



Installation-friendly

Easy execution of installations through fast, flexible hole-cutting in the web.



Straight

Glued components ensure minimal warp and shrinkage despite long lengths and the effects of moisture.



Strong

Carefully selected construction timber and special board materials work together to create the strength for which Masonite Beams is renowned.



Long

Standard lengths of up to 12 metres and the ability to produce up to 18.3 metres.



Lightweight

The low weight of the I-joist produces products that are easy to handle.



Inspection & certificate

Control of strength for finger joints and glued joints is carried out daily in our own operating laboratory. Every week we test the strength and stiffness properties of entire I-joist in our in-house joist testing rig. Self-monitoring are carried out in accordings with RISE's inspection instructions. In addition, RISE performs supervisory inspections twice a year.





The customer's needs in focus

Based on your needs and our knowledge of building technology and costs in the construction process, we adapt and optimise complete solutions with services and products. Our goal is to provide you with the best solution. This means that we often recommend other products to supplement our system.



Design

With our 40 years' experience of various building types and building systems, we possess knowledge and experience in many of the important areas of the construction process, including:

- ✓ Energy
- ✓ Fire safety



Technical support

Masonite Beams' customer centre and designers can help with design and dimensioning. We offer advice on structural engineering and construction, as well as support for machining, hole-cutting and reinforcements. Dimensioning programs, design instructions and other aids are available to support you in your own design activities. Please feel free to ask us about your next project.



Packaging

Transport is optimized by nested-packing the lightweight beams into flat packages. Studies show that this packaging method is between 30 and 100% more efficient compared to not interlocking the beams

Pre-cut centre

Masonite Beams offers pre-cut I-joist that simplify the construction process, reduce waste and deliver high quality industrial production. Machining is performed to an accuracy of 0.2 mm in our CNC machines. We carry out processes such as hole-cutting, precision and mitre cutting, reinforcements, eaves rafters, web insulation and filling according to our customers' wishes. We package pre-cut I-joist and deliver various types of fittings adapted to the joist delivery.



Packed according to specifications

Packed according to the customer's wishes.



Letter markings

Marking according to drawing.



Web filling/end blocks

Web reinforcement with filling/end blocks made of particle board.



Hole-cutting

Studs and I-joist can be supplied with holes of various sizes and shapes. Round, oval or oblong.



Mitre cutting

We can supply mitre-cut and straight studs and I-joist in one or more sections.



Web insulation

Web-insulated I-joist and studs.



Fittings

Various types of fittings adapted to I-joists.



Eaves rafters

Eaves rafters made of solid wood in various shapes and designs.



Glulam

Glulam can be supplied as a supplement to our products.



Things to consider when designing

For optimal and cost-effective design, it is important to carefully consider and think through a number of aspects. Below, Masonite Beams list various aspects that can be useful to consider when designing, in order to achieve a well thought-out and cost-effective end product.

Discuss the conditions for the design with the customer, e.g.:

- ✓ What will the live load and dead load be on each building component?
- ✓ Are there any additional loads, e.g. ventilation units?
- ✓ What safety class and service class will be used?
- ✓ Will there be installations in the structure?
Remember to adjust the I-joist height to be able to cut holes to fit ventilation and sewage pipes.

Design in detail

- ✓ Decide which inner walls are load-bearing and which are not.
- ✓ Generally speaking, it is cheaper to use a joist with a larger flange dimension and a larger c/c dimension.
- ✓ Decide how connections should be made.
For example, the right type of installation for windows and doors can result in significantly smaller thermal bridges.



Travel centre in Örnsköldsvik.

Photo: Nils-Olof Sjöden

We possess knowledge about the entire construction process, from design to production. We can therefore help you develop the most comprehensive economic solution.

Save time and add value with the right components

By using Masonite Beams' standardised building details, you can minimise installation time and reduce costs at the construction site. In this way, you achieve a quality-assured design, creating added value for both the designer and the customer.

Inspection

Check the finished design, ask a colleague to check one more time.

This can be absolutely crucial for the end result! You should also consider the need for components such as rows of nogging in floor structures, fittings, web reinforcement and web insulation.



Approved and certified products

Our products are CE marked and approved according to European Technical Approval (ETA), which means that the products can be sold throughout Europe and that sizing can take place in accordance with Eurocode 5. We also have a number of eco-labels, making it easier for you to obtain environmental certification for your projects. See below, or visit masonitebeams.com.



CE marking

As of 1 July 2013, construction products covered by a harmonised standard must have a declaration of performance and CE marking in order to be sold within the EU, according to the EU's Construction Products Regulation.

www.boverket.se



ETA

The European technical assessment (ETA) is an alternative for construction products not covered by a harmonised standard. The ETA route allows manufacturers to CE-mark their products, as laid down in the Construction Products Regulation.

www.ri.se and www.eota.eu



FSC®

FSC stands for the Forest Stewardship Council® and is an independent, international member organisation that promotes the environmentally friendly, socially responsible and economically viable use of the world's forests, through its FSC certification system.

www.fsc.org



PEFC

PEFC is a system for the certification of environmentally friendly and sustainable forestry. In Sweden, PEFC is endorsed by LRF (the Federation of Swedish Farmers) and the forest owners' associations.

www.pefc.se



ISO certification

We are internationally certified in accordance with ISO 9001 and ISO 14001 in order to maintain the high quality of our products and our environmental work.

www.ri.se



BASTA

Our BASTA registration allows us to verify that our products satisfy agreed property criteria in respect of environmental and health hazards.

www.bastaonline.se



Byggsvarubedömningen

Byggsvarubedömningen assesses and provides information about construction-related products in order to promote product development with the aim of achieving a non-toxic, high-quality built environment and responsible supply chains.

www.byggsvarubedomningen.se



Produkten finns med i SundaHus

SundaHus

Masonite Beams is assessed according to SundaHus' assessment criteria. SundaHus is working to phase out hazardous substances and to document the content of the buildings.

www.sundahus.se

FLOORS

Quick-mounted floor structures with even results. Easy to cut holes in. No creaking floors. High sound insulation. These are some of the advantages of floor structures built with Masonite Beams' I-joists.

Masonite Beams' dimensionally stable I-joists do not shrink or warp, preventing the need for expensive subsequent adjustments. The floor system is excellent when it comes to dampening impact sound and airborne sound. In short, Masonite Beams is an affordable, modern and efficient choice. Use our technical specifications to find the right solution for your particular project.

Floors



Floors

Dimensional stability

A low proportion of homogeneous wood and glued components means that Masonite Beams' I-joists demonstrate a high level of dimensional stability. The products are characterised by minimal warp, low levels of shrinkage and an extremely straight product.

The use of I-joists, compared with traditional wooden floor structures, provides many advantages:

- Even floors and walls
- Good dimensional stability – minimised risk of visible gaps or cracks
- No abnormally large movements that vary over the year – more secure waterproofing
- Very small risk of creaking floors

Simple installations with higher efficiency during installation

The use of Masonite Beams' I-joists in floor structures ensures that installations can be carried out easily thanks to versatile hole-cutting in the thin web. Making holes in our I-joists is quick and easy. If the customer prefers, the I-joists can also be supplied customised from the factory.

This saves time and money, allowing a carpenter to work more efficiently with shorter wiring runs and fewer pipe bends. At the same time, pre-cut I-joist and tried and tested structures provide overall building efficiency with minimal material waste. A comparison shows that a traditional solid floors can require around 38%* more labor time compared to a floor structure built with lightweight I-joists.

Floors with high acoustic requirements

Apartment blocks and buildings with apartments separated by floor structures have high acoustic requirements in order to achieve good acoustic comfort between homes, e.g. in terms of impact sound and airborne sound. Masonite Beams has been working with research and development of acoustic solutions for floor structures for more than 30 years and still leads the way in this area. We offer I-joist solutions, with tests showing that, despite their relatively simple design, our floors achieve extremely good acoustic properties. Our floor structure design for sound insulation can be combined with the building system's patented floor structure hangers and Sylomer cushions, which effectively dampen vibrations and a quick installation.

* See more at masonitebeams.com



Floor structures (2-support)



Residential building

Conditions:

- Maximum span for 2-support floor joist.
- L expressed in metres between the centre of the supports.
- Centre distance: 0.40 m and 0.6 m.
- Dead load: Floor structures non apartment separating: 0.65 kN/m², Floor structures non apartment separating: 1.0 kN/m².
- Live load: 2.0 kN/m².
- Deflection caused by dead load + live load: Floor structure non apartment separating L/300, Floor structure separating apartments L/450.
- Deflection criteria: Floor structure non apartment separating: max 1.5 mm, Floor structure separating apartments: max 0.9 mm.
- Calculations with composite action, between I-joist and 22 mm chipboard flooring. This assumes that the chipboard is carefully screwed and glued (known as screw-gluing) in accordance with the chipboard manufacturers' instructions.
- The calculations assume there is no transverse reinforcement (nogging). However, you are recommended to use one row of nogging in the case of spans in excess of 4 m and two rows of nogging in the case of spans above 7 m. See *nogging*, page 29.
- Sound class BBR requires a joist height of at least 300 mm, sound class B or higher requires a joist height of at least 350 mm.

Maximum span for 2-support floor joist

	Non apartment-separating		Apartment-separating	
Joist type	s400	s600	s400	s600
H 200s	3.80	3.27		
H 220s	4.12	3.55		
H 250s	4.58	3.94		
H 300s	5.30	4.56	4.29	3.66
H 350s	5.97	5.14	4.84	4.13
H 400s	6.50	5.70	5.36	4.57
H 450s	6.93	6.21	5.86	5.00
H 500s	7.34	6.57	6.34	5.40
HI 200s	4.35	3.74		
HI 220s	4.72	4.06		
HI 250s	5.24	4.51		
HI 300s	6.07	5.22	4.92	4.19
HI 350s	6.66	5.89	5.55	4.73
HI 400s	7.17	6.42	6.14	5.24
HI 450s	7.65	6.85	6.71	5.73
HI 500s	8.10	7.25	7.26	6.19
HB 250s	5.85	5.03		
HB 300s	6.60	5.83	5.48	4.67
HB 350s	7.21	6.46	6.18	5.28
HB 400s	7.77	6.96	6.85	5.85
HB 450s	8.29	7.42	7.49	6.39
HB 500s	8.78	7.86	8.10	6.92

The span table is based on the rules SS-EN-1995-1-1, EKS11.

Floor structures (3-support)



Residential building

Conditions:

- Maximum span for 3-support floor joist.
- L expressed in metres between the centre of the supports.
- Centre distance: 0.40 m and 0.6 m.
- Dead load: Floor structures non apartment separating: 0.65 kN/m², Floor structure separating apartments: 1.0 kN/m².
- Live load: 2.0 kN/m².
- Deflection caused by dead load + live load: Floor structure non apartment separating L/300, Floor structure separating apartments L/450.
- Deflection criteria: Floor structure non apartment separating: max 1.5 mm, Floor structure separating apartments: max 0.9 mm.
- Calculations with composite action, between I-joist and 22 mm particle board flooring. This assumes that the chipboard is carefully screwed and glued (known as screw-gluing) in accordance with the chipboard manufacturers' instructions.
- The calculations assume there is no transverse reinforcement (nogging). However, you are recommended to use one row of nogging in the case of spans in excess of 4 m and two rows of nogging in the case of spans above 7 m. See *nogging*, page 29.
- Sound class BBR requires a joist height of at least 300 mm, sound class B or higher requires a joist height of at least 350 mm.

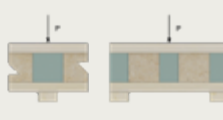
Maximum span for 3-support floor joist

Joist type	Non apartment-separating		Apartment-separating	
	s400	s600	s400	s600
H 200s	4.28	3.81		
H 220s	4.62	4.13		
H 250s	5.13	4.61		
H 300s	5.92	5.38	4.73	4.21
H 350s	6.68	6.05	5.37	4.75
H 400s	7.30	6.54	5.98	5.26
H 450s	7.79	6.97	6.57	5.78
H 500s	8.24	7.36	7.13	6.27
HI 200s	4.75	4.23		
HI 220s	5.14	4.60		
HI 250s	5.70	5.15		
HI 300s	6.59	6.05	5.29	4.67
HI 350s	7.43	6.73	6.00	5.26
HI 400s	8.08	7.23	6.68	5.84
HI 450s	8.61	7.70	7.34	6.43
HI 500s	9.11	8.14	7.97	7.01
HB 250s	6.24	5.67		
HB 300s	7.22	6.66	5.84	5.09
HB 350s	8.14	7.29	6.62	5.75
HB 400s	8.77	7.85	7.36	6.41
HB 450s	9.34	8.36	8.08	7.08
HB 500s	9.89	8.84	8.77	7.75

The span table is based on the rules SS-EN-1995-1-1, EKS11.

Bearing capacity

Evenly distributed load **with** point load.

	End bearing [kN]								Inner bearing/mid-span [kN]															
Joist depth (mm)	Without web reinforcement				With web reinforcement				Without web reinforcement				With web reinforcement											
																								
	Bearing length (mm)				Bearing length (mm)				Bearing length (mm)				Bearing length (mm)											
	45	70	95	145	45	70	95	145	45	70	95	145	45	70	95	145								
H200	5.5	5.5	6.9	8.0	5.5	6.9	8.0	8.3	8.6	10.7	12.5	15.5	8.6	10.7	12.5	15.5								
H220	5.5	5.5	6.9	8.0				9.0																
H250	5.5	5.5	6.9	8.0				9.9																
H300	4.3	4.3	5.3	6.2				7.2	8.5	9.5	11.6													
H350	4.5	4.5	5.5	6.2																				
H400	4.5	4.5	5.4	6.1																				
H450	4.3	4.3	5.2	5.6																				
H500	3.7	3.7	4.3	4.7																				
HI200	6.5	8.1	8.3	8.3	6.5	8.1	9.4	8.3	10.5	13.0	15.2	16.6	10.5	13.0	15.2	16.6								
HI220	6.5	8.1	9.0	9.0				9.0				17.9												
HI250	6.5	8.1	9.4	10.0				10.0				18.8												
HI300	5.0	6.2	7.2	9.0				11.6																
HI350	5.3	6.4	7.3	8.5				8.8	10.2	11.0	13.4													
HI400	5.2	6.3	7.1	8.1																				
HI450	5.0	5.9	6.6	7.3																				
HI500	4.3	5.0	5.5	6.0																				
HB250	7.4	9.2	10.0	10.0	7.4	9.2	10.7	10.0	12.9	16.1	18.8	19.9	12.9	16.1	18.8	19.9								
HB300	5.7	7.1	8.3	10.2				11.6	12.9			23.1												
HB350	6.0	7.3	8.3	9.7				13.2	10.8	12.8	14.2	17.3				23.2								
HB400	6.0	7.2	8.1	9.2													13.3	12.6	13.6	16.6				
HB450	5.7	6.8	7.5	8.4																	10.9	12.4	13.1	15.8
HB500	4.9	5.8	6.3	6.9																				

The dimensioning capacity is calculated for load duration class medium and climate class 1. The table is based on the rules in SS-EN-1995-1-1, EKS11.

Bearing capacity

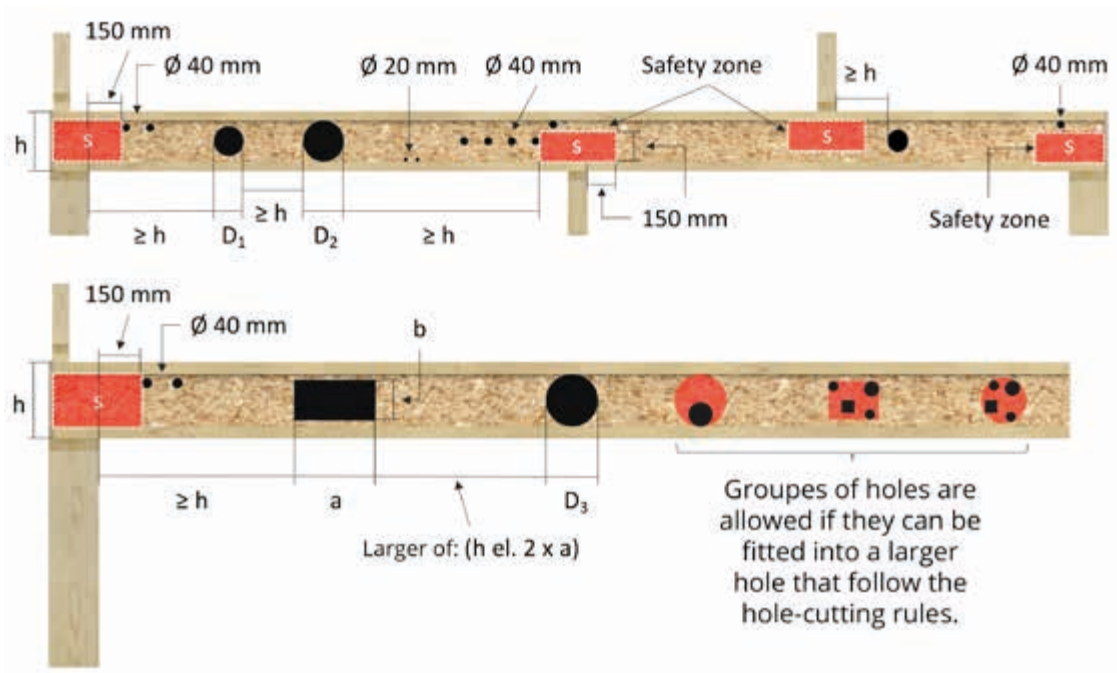
Evenly distributed load **without** point load.

Joist depth (mm)	End bearing [kN]								Inner bearing/mid-span [kN]							
	Without web reinforcement				With web reinforcement				Without web reinforcement				With web reinforcement			
																
	Bearing length (mm)				Bearing length (mm)				Bearing length (mm)				Bearing length (mm)			
	45	70	95	145	45	70	95	145	45	70	95	145	45	70	95	145
H200	5.5	6.9	8.0	8.3	7.2	8.3	8.3	8.3	8.6	10.7	12.5	15.5	11.2	13.4	15.0	16.6
H220				9.0	7.3	8.6	9.0	9.0					11.4	13.6	15.2	17.2
H250				9.9	7.4	8.8	9.6	10.0					11.6	13.9	15.5	17.6
H300					7.7	9.0	9.9	10.7					12.0	14.3	16.0	18.2
H350					7.9	9.3	10.2	11.1					12.3	14.8	16.5	18.7
H400					8.2	9.6	10.5	11.4					12.7	15.2	17.0	19.3
H450	5.3	6.6	7.7	9.5	8.4	9.9	10.9	11.7	8.6	10.7	12.5	15.5	13.1	15.7	17.5	19.9
H500	4.7	5.8	6.8	8.4	8.6	10.2	11.2	12.1					13.5	16.1	18.0	20.4
HI200	6.5	8.1	9.4	8.3	8.3	8.3	8.3	8.3	10.5	13.0	15.2	18.8	16.6	13.6	16.3	16.6
HI220				9.0	9.0	8.5	9.0	9.0					17.9	13.8	16.5	17.9
HI250				11.6	10.0	8.7	10.0	10.0					14.1	16.9	18.9	19.9
HI300					9.0	10.6	11.6	11.6					14.5	17.4	19.5	22.0
HI350					9.2	10.9	11.9	12.9					15.0	17.9	20.1	22.7
HI400					9.5	11.2	12.3	13.3					15.4	18.5	20.7	23.4
HI450	6.2	7.7	9.0	11.1	9.8	11.5	12.7	13.7	10.5	13.0	15.2	18.8	15.9	19.0	21.3	24.1
HI500	5.4	6.8	7.9	9.7	10.1	11.9	13.0	14.1					16.3	19.6	21.9	24.8
HB250	7.4	9.2	10.7	10.0	10.0	9.9	10.0	10.0	12.9	16.1	18.8	23.2	19.9	17.4	19.9	19.9
HB300				13.2	11.6	10.2	11.6	11.6					23.1	17.9	21.5	23.1
HB350					13.2	10.6	12.4	13.2					18.5	22.2	24.8	26.3
HB400					13.3	11.2	13.2	14.5					19.6	23.5	26.3	29.6
HB450	7.1	8.8	10.3	12.7	12.3	14.5	15.9	16.4					21.6	25.9	28.9	32.8
HB500	6.2	7.7	9.0	11.1	13.5	15.9	17.4	18.1					23.6	28.3	31.7	35.9

The dimensioning capacity is calculated for load duration class medium and climate class 1. The table is based on the rules in SS-EN-1995-1-1, EKS11.

Hole-cutting

The smart design of the I-joist provides great opportunities when it comes to hole-cutting, which is perfect if you want to hide installations. For further information regarding hole-cutting rules, see Masonite Beams' ETA 08/0012 at www.masonitebeams.se



Beam height (mm)		200	220	240	250	300	350	400	450	500
Largest hole (mm)		106	126	146	156	206	256	306	356	406
Minimum distance from support or point load		≥ h ¹⁾								
Minimum distance between circular holes	≤ 40 mm	2 x greater of (D1 or D2)								
	> 40 mm	≥ h ¹⁾								
Minimum distance to a rectangular hole		Greater of h or 2 x a								
¹⁾ All values are calculated for evenly distributed loads. Information for calculating reduction in transverse force can be found in Masonite Beams' ETA 12/0018. Contact Masonite Beams' Technical Support for consultation regarding holes that are outside of these rules.										

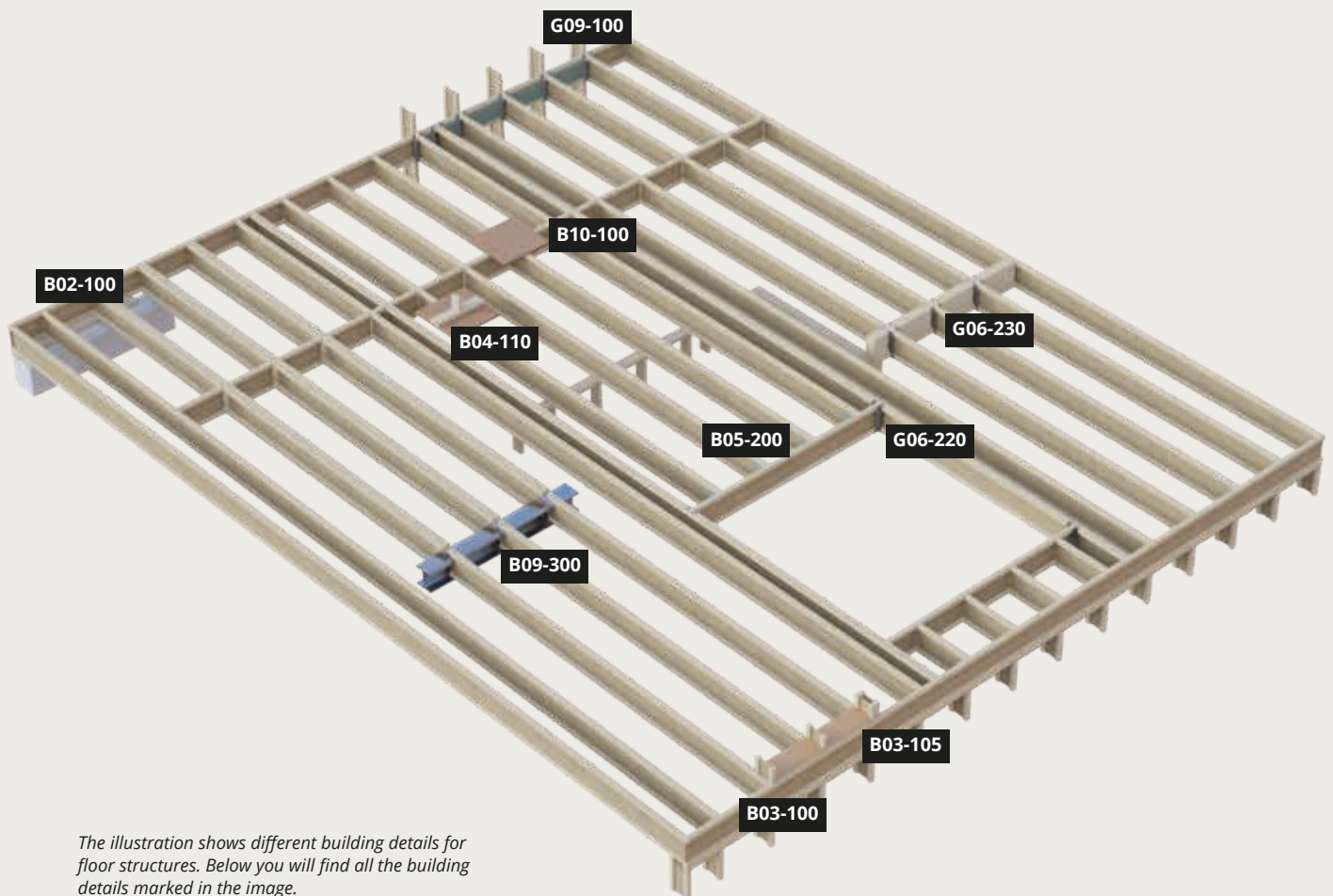
The table is based on the rules in SS-EN-1995-1-1, EKS11.

We assist with structural design and dimensioning

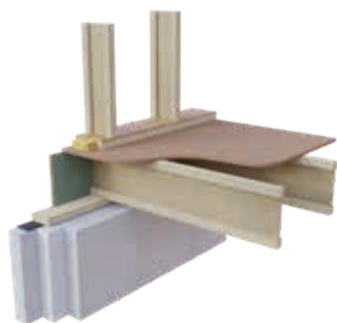
Our structural engineers offer advice on building technology and structural engineering, as well as support with modifications, web openings, and reinforcements. Contact us for your next project!



Building details, floors



The illustration shows different building details for floor structures. Below you will find all the building details marked in the image.



B02-100

Connection to concrete wall with internal insulating core. (See B02-200 for connection of wall with concrete core.)



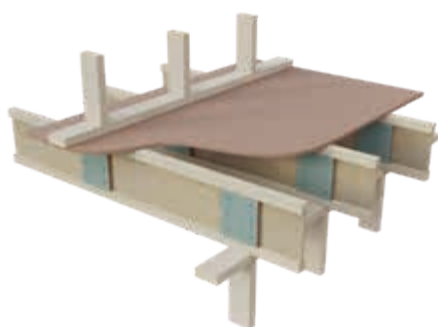
B03-100

Connection of mezzanine floor in wall using Masonite Beams' studs.



B03-105

Connection of mezzanine floor in wall using Masonite Beams' studs with installation of block reinforcements for increased capacity.



B04-110

Support capacity, centre support with or without reinforcements.



B05-200

Connection to lintel with particle board reinforcements.



G06-220

Joist hanger for Masonite Beams' I-joist, I-joist to I-joist.



G06-230

Joist hanger for Masonite Beams' I-joist, I-joist to solid wood.



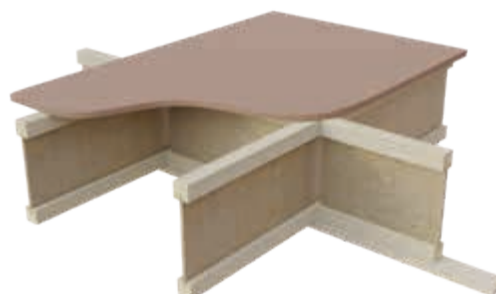
G09-100

Carrying cable screwed into wall studs.



B09-300

Masonite Beams' floor joist with bottom flange supported on steel beam.



B10-100

Recommended installation of row of noggings.

Read more and see more building details at www.masonitebeams.se.



Glänningeskolan School, Laholm

The new Glänningeskolan School in Laholm has been built in accordance with passive house standards. Here, the focus is on a functional and flexible layout, together with overall consideration for energy.

The school building consists of two simple two-storey structures surrounding a common entrance hall with a main staircase.





WALLS

Select Masonite Beams wall studs to construct energy-efficient wall solutions. The I-joist's reduced thermal bridging in walls cuts heat loss by up to 57 percent*, lowering the overall energy consumption of a house by five to nine percent* compared to a traditional stud frame.

Walls



Walls

Up to 57% reduction in heat losses

Walls built using Masonite Beams' I-joists offer good building economy and are also good in terms of energy. This is because our studs have smaller thermal bridges with a load-bearing layer that provides insulation at the same time. Low U-values are thereby obtained for a relatively thin wall. I-joists are therefore very suitable for low-energy and passive buildings.

Test reports show that the use of I-joists reduces heat losses by approximately 57% via thermal bridges and that the U-value is on average 14%* lower than for conventional wooden stud structures. In a report comparing traditional timber studs with lightweight beams, total energy consumption was estimated to decrease by approximately 5–9%* when lightweight beams were used compared to a traditional frame.

15% increase in building efficiency

Masonite Beams' wall studs are straight and dimensionally stable. Time for installation can be lowered since wall studs can be manufactured in widths up to 400 mm. This avoids having a structure with pre-cut I-joists with tried and tested structures in order to achieve a thick, well-insulated wall.

Calculations based on Wikells Sektionsdata show that a stud wall constructed with Masonite Beams can reduce labor time by nearly 15%* compared to an equivalent traditional stud wall.

47% less raw material

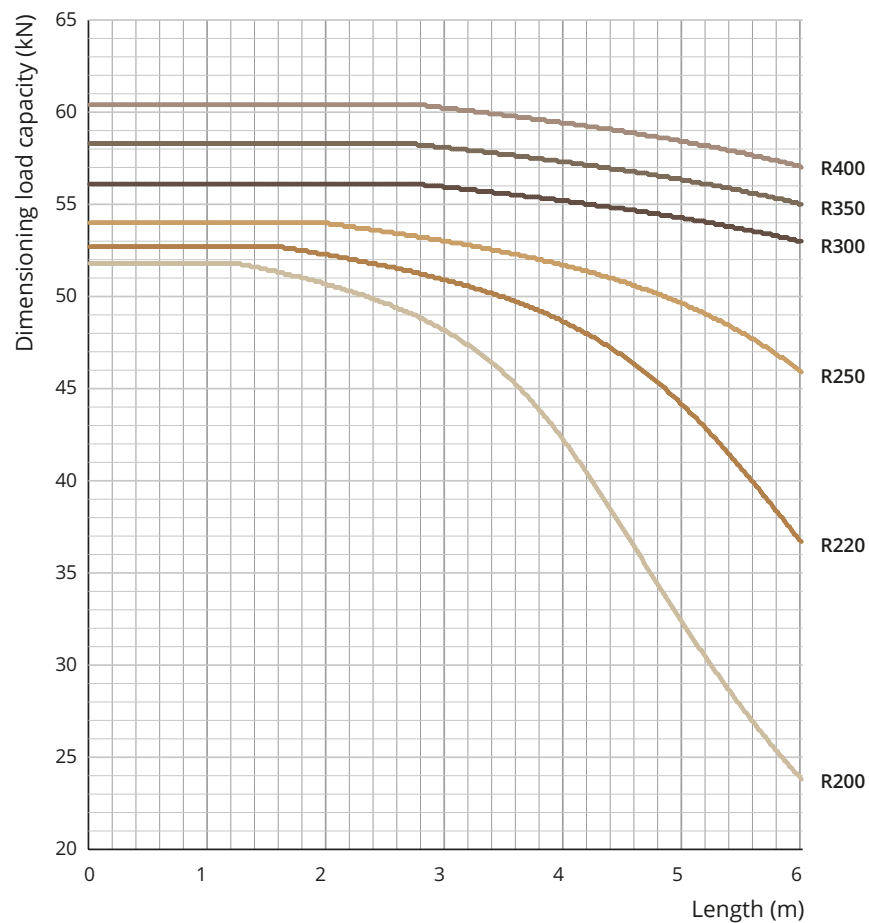
Because our I-joists use narrow timber dimensions, they require up to 47%* less raw material compared with traditional structural timber.

* See more at masonitebeams.com



Wall loads

The maximum design load N_d , in the case of buckling in the rigid direction can be seen in the diagram below for various stud lengths. In the table below the studs are assumed to be stiffened from buckling in the weak direction with stabilising sheet material.



The dimensioning N_d capacity is calculated for load duration class medium and climate class 1. The table is based on the rules in SS-EN-1995-1-1, EKS11.

Bearing capacity

A wall load absorbing capacity is often limited by the bearing capacity of the sill. Below are a number of commonly used versions and their bearing capacity N_d at various stud and sills widths.

Bearing capacity N_d (kN)*				
Sill type				
Width (mm)	Type S	Timber C18	Type S+	Type S/S+*
200	28.8	25.0	34.9	42.8
220	28.8	25.9	34.9	44.6
240	28.8	26.9	34.9	46.4
250	28.8	27.3	34.9	47.3
300	28.8	29.6	34.9	51.9
350	28.8	31.9	34.9	56.5
400	28.8	34.2	34.9	61.0
*Sill filled out with C18 quality timber.				

The dimensioning capacity is calculated for load duration class medium and climate class 1. The table is based on the rules in SS-EN-1995-1-1, EKS11.

Building details, walls

The illustration shows different building details for wall structures. On the following pages you will find all the building details marked in the image.



Read more and see more building details at www.masonitebeams.se.



Y01-400

Building detail that presents various types of corner solutions.



Y01-500

Various ways to insulate Masonite Beams' studs.



Y02-010

Connection of exterior wall to foundation wall with insulating core.



Y02-013

Connection of exterior wall to foundation wall with insulating core and reinforced Masonite Beams studs.



Y05-201

Lintel above wall opening.



Y06-100

Connection of ceiling to wall.



Y07-100

Solution with Masonite Beams as a curtain wall.



Y08-100

Installation of Masonite Beams' studs on load-bearing frame made of cross-laminated timber, for example.



Y09-100

Fastening windows and doors in web-reinforced Masonite Beams studs.

Read more and see more building details at www.masonitebeams.se.

ROOFS

Heavy snow loads are not a problem with roof I-joist from Masonite Beams. Thanks to the joist height of up to 500 mm, the joist can cope with large spans. It is also cost-effective for well-insulated structures. This makes the I-joist suitable for low-energy and passive house buildings.



Roofs

Flexible design

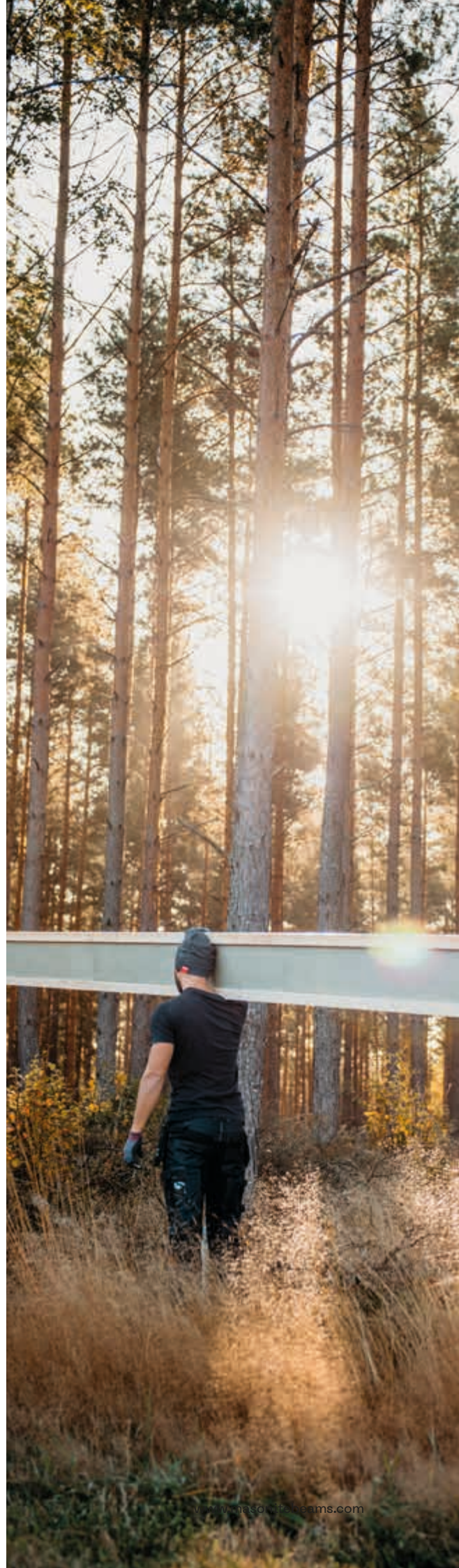
A roof made using Masonite Beams' I-joists is a very cost-effective alternative for achieving well-insulated structures. I-joists combined with pre-cut, such as mitre cutting, cut-outs and reinforcements, also offer great flexibility when designing a roof.

Strong and long

Joist heights of up to 500 mm mean that it is possible to achieve large spans, even with heavy snow loads. It also means that it is easy to achieve roof structures with very good insulation, and the I-joist is therefore very suitable for roofs on low-energy and passive house buildings.

Easy on site

The low weight of the I-joist provides benefits when installing roof structures. The low weight means lower transport costs and less need for large cranes on the construction site. One person can easily carry a joist that is 250 mm high, 10 m long and weighs 31 kg. The weight of an equivalent timber joist is 66 kg.



Roof I-joist (2-support)

Residential building



Conditions:

- Maximum span for 2-support roof joist
- L expressed in metres between the centre of the supports.
- ^{a)} At pitches above 15°, special dimensioning is conducted; alternatively, contact our Technical Support
- Climate class 1. Permanently heated buildings without humidification and ventilated attic spaces above permanently heated premises
- Purlin distance: 0.60 m and 1.20 m.
- Dead load: Pitch ≤ 15° lightweight roof, roofing felt or steel sheet: 0.60 kN/m².
- Snow load: Roof with snow guard, form factor = 1.00
- Deformation: Characteristic load, deformation requirement L/300 for final deformation. If the deformation of purlins can cause permanent damage to other parts of the building, it is necessary to check whether the deformation requirements are sufficient!
- General: Use load-distributing ceilings/battening. Purlins should be reinforced above supports.

Maximum span for 2-support roof joist

Snow zone	1.0 kN/m ²		1.5 kN/m ²		2.0 kN/m ²		2.5 kN/m ²		3.0 kN/m ²		3.5 kN/m ²		4.0 kN/m ²		4.5 kN/m ²		5.0 kN/m ²	
Roof pitch	0–15°		0–15°		0–15°		0–15°		0–15°		0–15°		0–15°		0–15°		0–15°	
Centre distance	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200
H200s	3.82	2.91	3.52	2.67	3.22	2.42	3.03	2.26	2.87	2.13	2.73	2.02	2.62	1.93	2.52	1.84	2.43	1.77
H220s	4.16	3.17	3.82	2.91	3.50	2.64	3.30	2.47	3.12	2.33	2.98	2.21	2.86	2.11	2.74	2.02	2.65	1.94
H250s	4.63	3.55	4.27	3.25	3.91	2.96	3.68	2.77	3.49	2.62	3.33	2.49	3.19	2.37	3.07	2.27	2.96	2.19
H300s	5.39	4.14	4.97	3.80	4.56	3.46	4.29	3.25	4.07	3.07	3.89	2.92	3.73	2.79	3.59	2.68	3.47	2.57
H350s	6.10	4.70	5.63	4.32	5.17	3.94	4.87	3.70	4.62	3.50	4.42	3.33	4.24	3.18	4.08	3.02	3.94	2.88
H400s	6.79	5.24	6.26	4.81	5.75	4.39	5.42	4.13	5.15	3.88	4.92	3.63	4.72	3.42	4.55	3.24	4.37	3.09
H450s	7.44	5.75	6.86	5.29	6.31	4.83	5.95	4.47	5.65	4.13	5.40	3.86	5.14	3.64	4.88	3.45	4.65	3.29
H500s	8.07	6.24	7.45	5.74	6.85	5.17	6.46	4.71	6.14	4.36	5.76	4.07	5.43	3.84	5.14	3.64	4.90	3.47
HI200s	4.33	3.28	3.98	3.00	3.63	2.71	3.41	2.53	3.23	2.38	3.08	2.25	2.94	2.14	2.82	2.04	2.72	1.96
HI220s	4.71	3.58	4.33	3.27	3.96	2.96	3.72	2.77	3.52	2.60	3.36	2.47	3.21	2.35	3.08	2.24	2.97	2.15
HI250s	5.26	4.00	4.84	3.67	4.42	3.32	4.16	3.11	3.94	2.93	3.76	2.78	3.60	2.65	3.46	2.53	3.33	2.43
HI300s	6.12	4.68	5.63	4.29	5.16	3.89	4.85	3.65	4.60	3.44	4.39	3.27	4.21	3.12	4.05	2.99	3.90	2.85
HI350s	6.93	5.31	6.38	4.87	5.85	4.43	5.51	4.16	5.23	3.93	4.99	3.73	4.78	3.56	4.60	3.41	4.44	3.24
HI400s	7.70	5.91	7.09	5.43	6.51	4.95	6.13	4.64	5.82	4.39	5.56	4.17	5.33	3.98	5.13	3.82	4.95	3.65
HI450s	8.44	6.49	7.78	5.96	7.14	5.44	6.73	5.10	6.39	4.83	6.10	4.59	5.85	4.39	5.64	4.20	5.44	4.01
HI500s	9.16	7.05	8.44	6.48	7.75	5.91	7.31	5.55	6.94	5.26	6.63	4.96	6.36	4.68	6.12	4.43	5.92	4.23
HB250s	5.82	4.41	5.35	4.03	4.89	3.64	4.59	3.40	4.35	3.20	4.14	3.03	3.96	2.88	3.80	2.70	3.66	2.45
HB300s	6.78	5.16	6.23	4.72	5.70	4.28	5.36	4.00	5.08	3.77	4.84	3.57	4.63	3.40	4.45	3.13	4.29	2.85
HB350s	7.68	5.86	7.06	5.37	6.47	4.87	6.09	4.56	5.77	4.30	5.50	4.08	5.27	3.89	5.07	3.57	4.89	3.24
HB400s	8.53	6.53	7.86	5.98	7.20	5.44	6.78	5.10	6.43	4.81	6.13	4.57	5.88	4.36	5.65	4.01	5.45	3.65
HB450s	9.35	7.17	8.61	6.58	7.90	5.98	7.44	5.61	7.06	5.30	6.73	5.04	6.46	4.81	6.21	4.45	5.99	4.04
HB500s	10.14	7.79	9.34	7.15	8.57	6.51	8.07	6.10	7.66	5.77	7.31	5.49	7.01	5.24	6.75	4.90	6.52	4.45

The span table is based on the rules in SS-EN-1995-1-1, EKS11.

Roof I-joist (3-support)

Residential building



Conditions:

- Maximum span for 3-support roof joist
- L expressed in metres between the centre of the supports.
- *) At pitches above 15°, special dimensioning is conducted; alternatively, contact our Technical Support
- Climate class 1. Permanently heated buildings without humidification and ventilated attic spaces above permanently heated premises
- Purlin distance: 0.60 m and 1.20 m.
- Dead load: Pitch ≤ 15° lightweight roof, roofing felt or steel sheet: 0.60 kN/m².
- Snow load: Roof with snow guard, form factor = 1.00
- Deformation: Characteristic load, deformation requirement L/300 for final deformation. If the deformation of purlins can cause permanent damage to other parts of the building, it is necessary to check whether the deformation requirements are sufficient!
- General: Use load-distributing ceilings/battening. Purlins should be reinforced above supports.

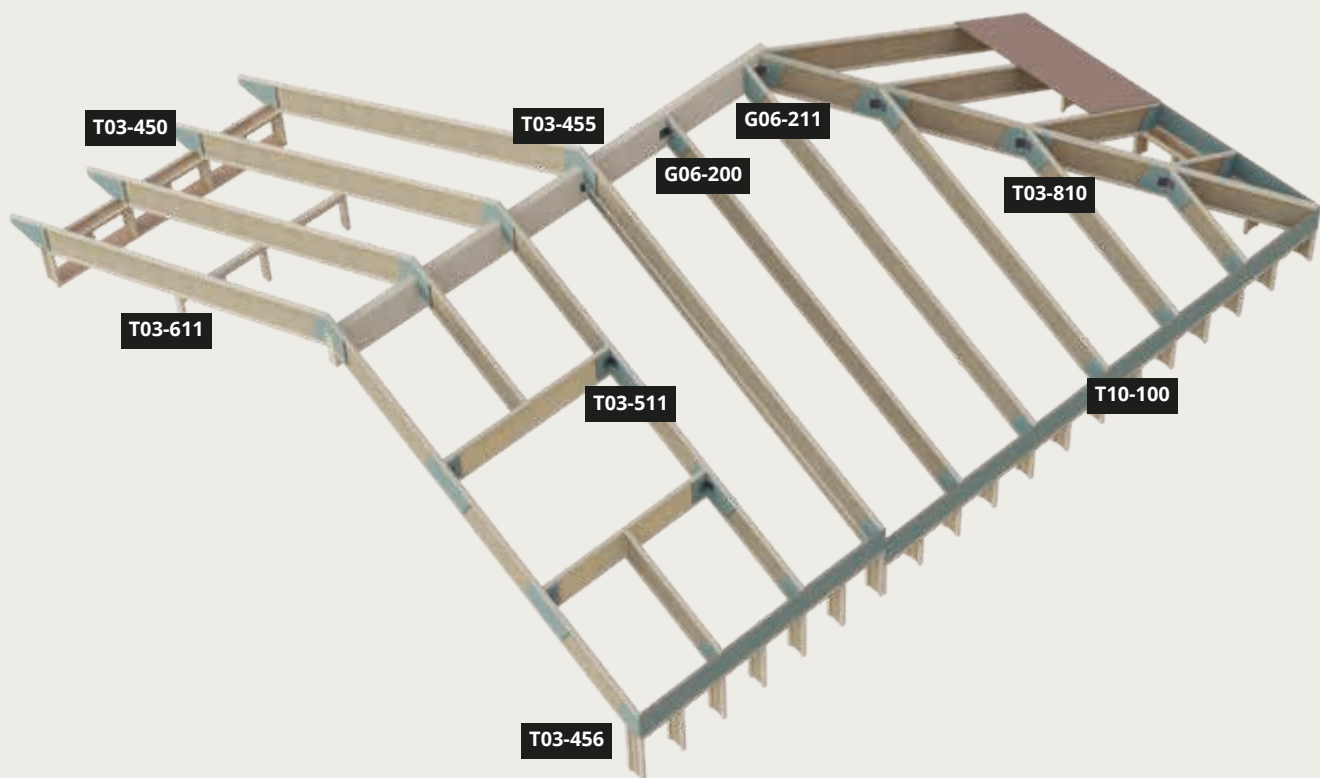
Maximum span for 3-support roof joist

Snow zone	1.0 kN/m²		1.5 kN/m²		2.0 kN/m²		2.5 kN/m²		3.0 kN/m²		3.5 kN/m²		4.0 kN/m²		4.5 kN/m²		5.0 kN/m²	
Roof pitch °	0–15°		0–15°		0–15°		0–15°		0–15°		0–15°		0–15°		0–15°		0–15°	
Centre distance	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200	600	1200
H200s	5.10	3.95	4.72	3.56	4.35	3.17	4.07	2.90	3.78	2.68	3.54	2.48	3.34	2.21	3.17	1.99	3.03	1.82
H220s	5.55	4.25	5.07	3.78	4.68	3.38	4.35	3.08	4.03	2.85	3.78	2.67	3.55	2.37	3.38	2.15	3.22	1.95
H250s	6.12	4.69	5.59	4.08	5.15	3.66	4.70	3.34	4.35	3.09	4.08	2.90	3.85	2.65	3.65	2.39	3.48	2.17
H300s	6.75	5.32	6.38	4.54	5.72	4.05	5.21	3.71	4.84	3.43	4.53	3.23	4.28	3.03	4.05	2.78	3.88	2.53
H350s	7.35	5.70	6.90	4.94	6.21	4.41	5.68	4.04	5.26	3.75	4.92	3.51	4.65	3.31	4.42	3.15	4.21	2.89
H400s	7.85	6.11	7.42	5.30	6.70	4.75	6.11	4.34	5.65	4.03	5.29	3.78	5.00	3.57	4.75	3.39	4.53	3.24
H450s	8.45	6.50	7.92	5.65	7.12	5.06	6.50	4.63	6.01*	4.30	5.65	4.03	5.32	3.82	5.05	3.62	4.83	3.46
H500s	8.95*	6.82	8.41	5.98	7.51	5.35	6.86	4.90	6.36*	4.55	5.95	4.62	5.63	4.03	5.35	3.83	5.10	3.67
HI200s	5.85	4.51	5.41	4.15	4.95	3.78	4.68	3.30	4.45	2.83	4.33	2.48	4.08	2.21	3.88	1.99	3.60	1.82
HI220s	6.25	4.86	5.90	4.49	5.35	4.10	5.07	3.56	4.82	3.05	4.60	2.67	4.34	2.37	4.13	2.15	3.88	1.95
HI250s	6.75	5.41	6.38	4.99	5.92	4.48	5.60	3.95	5.31	3.40	4.98	2.99	4.70	2.65	4.55	2.39	4.25	2.17
HI300s	7.45	6.22	7.00	5.53	6.58	4.95	6.36	4.52	5.90	3.95	5.53	3.45	5.21	3.09	4.95	2.78	4.73	2.53
HI350s	8.10	6.75	7.68	6.01	7.01	5.39	6.88	4.92	6.43	4.51	6.02	3.93	5.58	3.51	5.40	3.17	5.31	2.89
HI400s	8.74	7.25	8.23	6.45	7.72	5.78	7.42	5.29	6.89	4.89	6.46	4.43	6.08	3.95	5.78	3.56	5.51	3.24
HI450s	9.43*	7.74	8.75	6.87	8.30	6.14	7.80	5.26	7.32	5.21	6.85	4.88	6.46	4.38	6.14	3.97	5.85	3.61
HI500s	9.85*	8.19	9.32*	7.24	8.78	6.50	8.34	5.91	7.73	5.51	7.23	5.16	6.83	4.83	6.49	4.53	6.91	3.99
HB250s	7.23	6.02	6.84	5.59	6.48	4.75	6.18	3.95	5.95	3.40	5.85	2.98	5.25	2.65	4.73	2.39	4.31	2.17
HB300s	8.15	6.68	7.61	6.28	7.15	5.49	6.87	4.57	6.68	3.94	6.49	3.45	6.12	3.07	5.50	2.78	5.00	2.53
HB350s	8.82	7.31	8.33	6.85	7.81	6.26	7.48	5.21	7.20	4.49	7.08	3.94	6.68	3.49	6.62	3.17	5.69	2.89
HB400s	9.46*	7.85	8.96*	7.39	8.43	6.80	8.09	5.89	7.73	5.07	7.58	4.44	7.16	3.95	6.78	3.57	6.40	3.24
HB450s	10.15*	8.38	9.60*	7.91	8.92*	7.21	8.57	6.51	8.23	5.63	8.05	4.91	7.59	4.38	7.21	3.97	6.89	3.61
HB500s	10.65*	8.87*	10.11*	8.35	9.44*	7.61	9.10	6.95	8.73	6.16	8.49	5.41	8.01	4.82	7.60	4.35	7.52	3.99

The span table is based on the rules in SS-EN-1995-1-1, EKS11.

Building details, roof

The illustration shows different building details for roof structures. On the following pages you will find all the building details marked in the image.



G06-200

Installation of purlins against ridge beam with angle brackets.



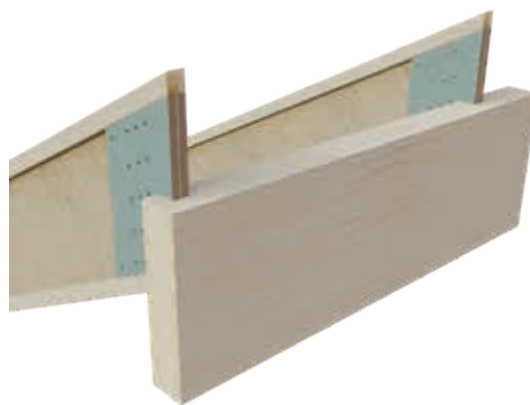
G06-211

Installation of purlins against ridge beam with joist hanger, type BSD.



T03-450

Connection at eaves with protruding reinforced beam end.



T03-455

Connection with beam that is reinforced and has cut-outs against ridge beam.



T03-456

Connection in eaves with cut bottom flange and reinforced beam end.



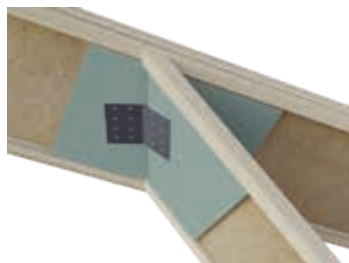
T03-511

Lintel on purlin with brackets.



T03-611

Centre support with reinforcement and wedge.



T03-810

Connection of joist to e.g. valley rafter.



T10-100

Principles for wind anchoring of roof joists.

Read more and see more building details at www.masonitebeams.se.

Building details



Connection by screwing.

Capacity: 1.5 kN.



Connection with particle board reinforcement.

See building component B05-100 for execution and capacity.



Connection with particle board reinforcement and screwing through flange.

See building component B05-200 for execution and capacity.



Connection with Masonite Beams' I-joist reinforced with particle board and joist hanger.

See building component G06-210 for execution and capacity.

Read more and see more building details at www.masonitebeams.se.

Fire

Fire protection

Rules for the fire protection of buildings can be found in BBR, section 5.

Fire technical building classes

If the building details is partitioning, it must be executed in at least the fire technical class specified in BBR, where buildings are divided into three classes, Br 1, Br 2 and Br 3.

Fire-rated building details

Load-bearing capacity (**R**): The time the building component can bear the load in case of fire.

Integrity (**E**): The time the building component part retains its integrity in case of fire.

Insulation (**I**): The time it takes for the cold side of the building component to reach a certain temperature.

Design classes are designated R, RE, E, EI and REI, and are combined with time requirements specified in minutes.

Design solutions

For floor, wall and roof structure solutions regarding fire and soundclasses, in which Masonite Beams' I-joists and studs are incorporated, alternative versions may exist. A prerequisite for satisfying the various requirements is that components included in structures are installed in accordance with instructions from e.g. Hus AMA (General material and labour description for house building), suppliers of surface layers, insulation, etc., as well as other enforceable instructions. See the relevant supplier's documentation, Gyproc, Isover and Paroc.

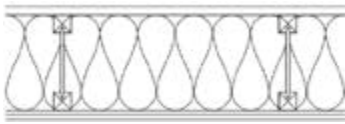
Examples of design solutions using Masonite I-joists and studs can be seen on the following pages.

Specified dimensions refer to minimum dimensions.



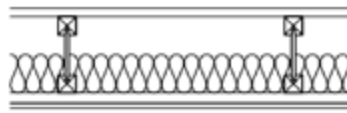
Hedlundaskolan school, Umeå.

Floor



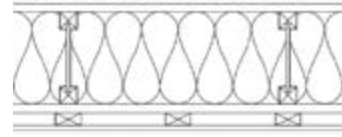
REI15

- 22 mm particle board
- H250 s600, glass wool insulation
- 22 x 70 mm secondary spaced boarding
- 12 mm roof particle board



REI30

- 15 mm OSB
- H200 s600, Mineral wool insulation
- 30 x 48 mm batten, s300
- 12.5 mm Plaster type A



REI60

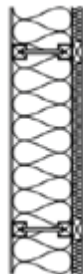
- 22 mm floor particle board
- H250 s600, wood fiber insulation or mineral wool
- acoustic hangers
- 45 x 95 mm s1200
- 34 x 70 mm s300
- 2 x 12.5 mm fibre plaster or 12.5 mm type A + 15 mm type F

Wall



REI30

- 12.5 mm type A
- R200 s600, mineral wool or wood fiber insulation
- 9 mm exterior plaster



REI60

- 12.5 mm Habito
- 34 x 70 mm s600, 45 mm Isover Ultimate or mineral wool
- Vapour barrier
- R200 s600, glass wool
- 9 mm exterior plaster



REI90

- 12.5 mm Habito
- 15 mm type F
- 34 x 95 mm s600, 45 mm glass wool
- Vapour barrier
- HI200 s600, glass wool
- 9 mm exterior plaster

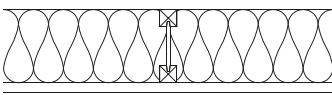
Walls separating apartments



REI60

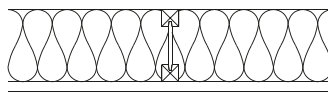
- 15 mm type F
- 12.5 mm type A
- 25 mm acoustic profile
- R200, glass wool
- 12.5 mm type A
- 15 mm type F

Attic floor



REI30

- H200 s1200, mineral wool
- Vapour barrier
- 28 x 70 mm s600
- 12.5 mm type A



REI60

- H200 s1200, 200 mm loose wool or mineral wool
- Vapour barrier
- 28 x 70 mm s400
- 12.5 mm type A
- 15.4 mm type F

Acoustic performance

Sound requirements are specified in BBR, section 7. If these are satisfied, the standard is normally acceptable. This is satisfied with Masonite Beams' building system, although we also have solutions for achieving significantly higher acoustic performance. We can supply solutions for sound classes A and B according to Swedish Standard SS 25267 for both floors and walls. Below are examples of our building details that are adapted for residential buildings.

Sound class A

- $D_{nT,w,50} \geq 60$ dB
- $L'_{nT,w,50} \leq 48$ dB

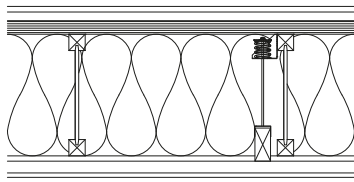
Sound class B

- $D_{nT,w,50} \geq 56$ dB
- $L'_{nT,w,50} \leq 52$ dB

BBR

- $D_{nT,w,50} \geq 52$ dB
- $L'_{nT,w,50} \leq 56$ dB

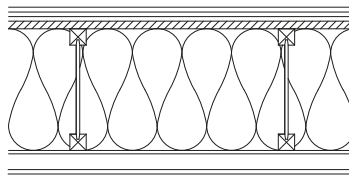
Floors



Mezzanine floor sound class A

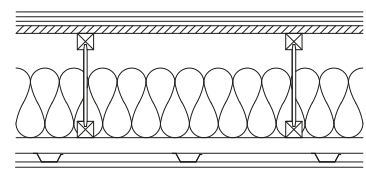
Mezzanine floors in sound class A require floor-to-wall suspension with Masonite

- Floor covering (e.g. 15 mm parquet on foam)
- Flooring panel (Steico or equivalent), adapted to the project
- 39 mm LVL screw-glued to I-joist
- 350 mm I-joist + 350 mm insulation, Thermowood
- 5 mm gap
- Ceiling frame consisting of cross-laid battens (34x70 mm + 34x70 mm) suspended from spring hangers
- 2x12.5 mm Fermacell A1 or 2x15.4 mm Gyproc Protect F



Mezzanine floor sound class B

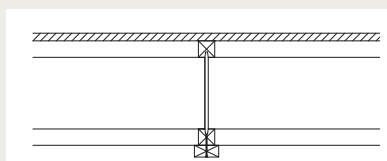
- Floor covering (e.g. 15 mm parquet on foam)
- 2x12.5 mm floor plaster
- 22 mm particle board screw-glued to I-joist
- 350 mm I-joist + 350 mm insulation e.g. Thermowood
- Ceiling frame suspended in Adarma sound profile (can be replaced with structure based on Gyproc AP)
- 12.5 mm Gyproc GN + 15.4 mm Gyproc Protect F



Mezzanine floor BBR

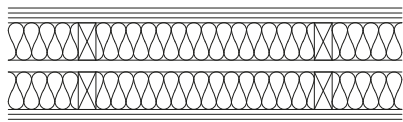
- Floor covering (e.g. 15 mm parquet on foam)
- 12.5 mm floor plaster
- 22 mm particle board screw-glued to I-joist
- 300 mm I-joist + 200 mm insulation e.g. Thermowood
- Studs 45x45 mm
- Ceiling frame, Gyproc AP
- 2x15.4 mm Gyproc Protect F

For all floors, rows of nogging must be installed for increased rigidity. Three rows of nogging are normally installed for spans up to 8 m. For spans below 6 m, 2 rows of nogging are acceptable.



Nogging are joined at the bottom with a batten measuring 34x70 mm. Screwed and glued to the bottom flange of the nogging.

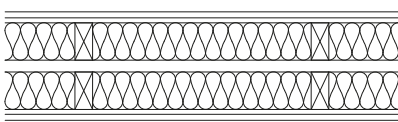
Walls



Walls separating apartments Sound class A

If the wall is load-bearing, it may need to be supplied with several studs joined together. This wall can be used, although we normally recommend combining floor structures in sound class A with walls in sound class B to ensure optimal performance and simplified execution. These walls can then be penetrating, which simplifies installation, although it is also a prerequisite in the case of taller buildings with load-bearing walls. These penetrating walls create some flanking transmission, which means that the final result as regards the airborne sound insulation is still sound class B. However, the impact sound level can always satisfy sound class, A if desired. With sound class A for impact sound level and sound class B for airborne sound insulation, this ensures a high-quality, well-balanced building with a lightweight frame.

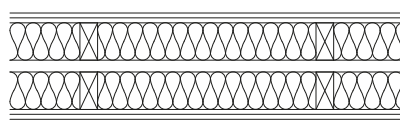
- 3x12.5 mm Gyproc GN or 3x10 mm Fermacell
- 45x95 mm studs 95 insulation
- 30 mm air gap
- 45x95 mm studs 95 insulation
- 3x12.5 mm Gyproc GN or 3x10 mm Fermacell



Walls separating apartments Sound class B

If the wall is load-bearing, it may need to be supplied with several studs joined together. This wall is combined with floor structure sound class A or floor structure

- 12.5 mm Gyproc GN or 10 mm Fermacell
- 15.4 mm Gyproc Protect F or 12.5 mm Fermacell
- 45x95 mm studs 95 insulation
- 30 mm air gap
- 45x95 mm studs 95 insulation
- 15.4 mm Gyproc Protect F or 12.5 mm Fermacell
- 12.5 mm Gyproc GN or 10 mm Fermacell



Walls separating apartments BBR

If the wall is load-bearing, it may need to be supplied with several studs joined together. This wall is normally combined with BBR floors.

- 2x12.5 mm Gyproc GN or 2x10 mm Fermacell
- 45x95 mm studs 95 insulation
- 30 mm air gap
- 45x95 mm studs 95 insulation
- 2x12.5 mm Gyproc GN or 2x10 mm Fermacell

Exterior walls

Exterior walls are adapted and dimensioned according to the conditions in the location where the building is to be situated. Masonite Beams has tried a number of different exterior wall designs in the laboratory, and can supply exterior walls with extremely good sound insulation adapted for all situations.

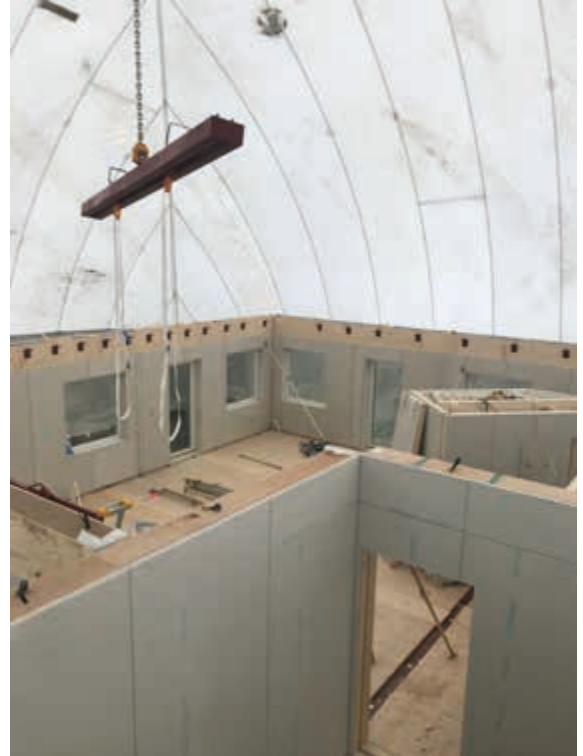


Guidelines for installing I-joist and studs

The installation guide of the manufacturer shall be followed. Especially the following points shall be noticed:

- The instructions of the manufacturer regarding the restraint of the compression flange and temporary bracing shall be followed. For moment resistance, it should be considered that the characteristic values apply when the compression flanges are laterally supported according to table below.
- The bearing length to be used shall be > 45 mm. For the effective support length, see Masonite Beams' ETA 12/0018.
- Web stiffeners may be used according to the instructions of the manufacturer.
- During installation, the finished product may be exposed for conditions corresponding to hazard class 3 during a short time before immediate protection against rain.

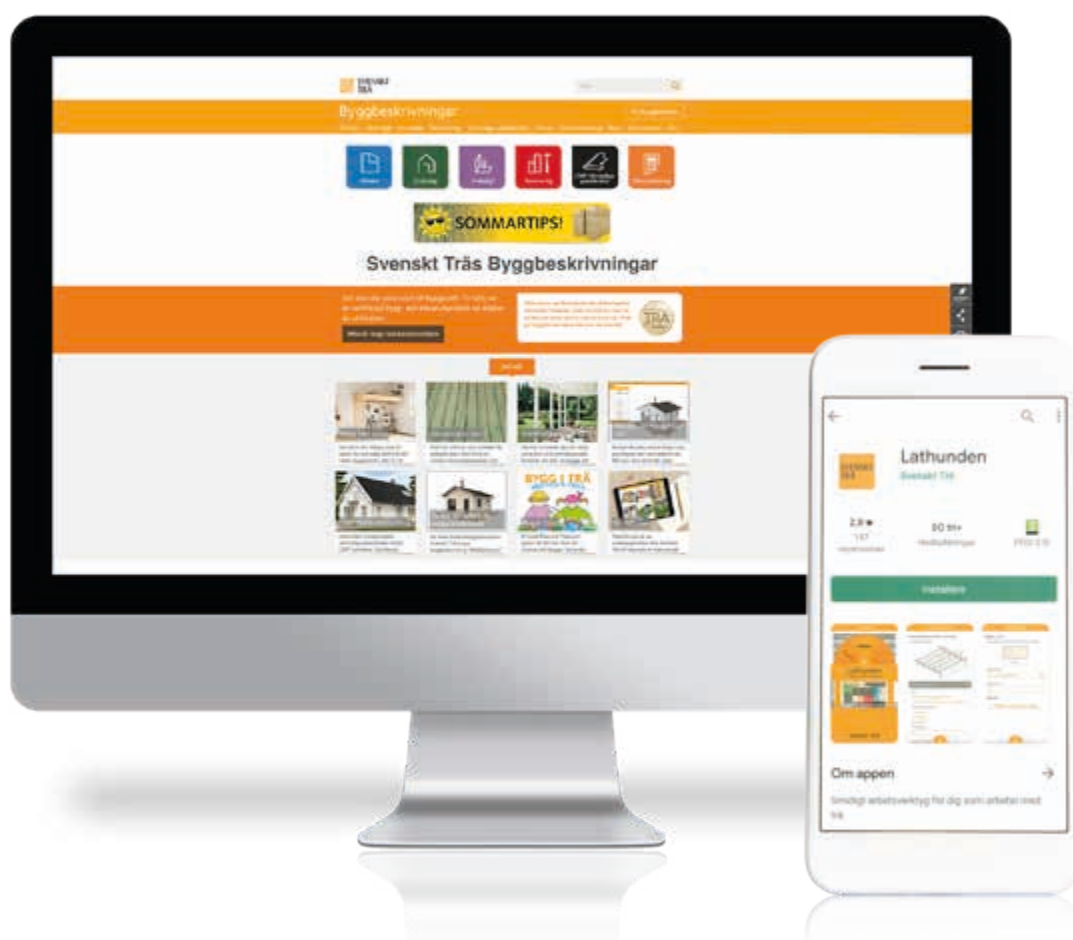
Joist type	Maximum distance for lateral support
H	350 mm
HI	600 mm
HB	1000 mm



With web reinforcement

At point loads higher than that permitted for I-joist without web reinforcement, the joist is reinforced with blocks made of 18 mm particle board or plywood on both sides of the joist web. The dimensions of the chipboard or plywood (a and b) must be the same as the support width, although not less than 100 mm. The reinforcement is nailed or screwwed into place with wire nails 75x2.8 mm distance or similar. A distance of approximately 4 mm is left between the top edge of the reinforcing element and the joist's top flange. See building component B04-110.





Design with I-joist!

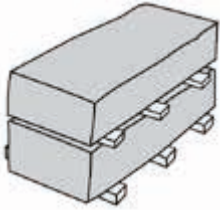
In Swedish Wood's app and on the website byggbeskrivningar.se, you can now dimension Masonite Beams' I-joists. Get an idea quickly and easily of how many I-joist are required in your project. The structures that can be designed with I-joists in the dimensioning program are: balconies with roof structures, freestanding carports, extended carports, freestanding conservatories, storage rooms, indoor floor structures, purlins and lean-to roof I-joist.

Download the app!

The app is free and you can find it on Google Play and in the AppStore. As before, our design department is happy to help with more precise sizing.

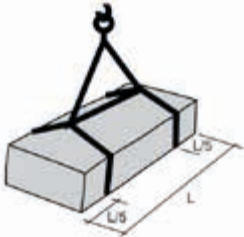


Storage, handling and safety recommendations



Recommendations on packaging, transport and Storage

- The beams and columns shall be protected against harmful wetting during transport and storage.
- weak axis may cause damage to the joists.
- Store handle I-joists vertically, properly covered and above the ground on stickers (min 100mm) with distance between centers of maximum 3 meter.
- We recommend that never store I-joist flatwise, but in case of short time (< 4 weeks) storage the beams can be stored flatwise if the centers between the stickers is maximum 1 meter.
- Use stickers to separate bundles and do not open bundles until time of installation.
- Pick bundles as shipped by the supplier and at the 5th points, using a spreader bar if necessary.



Recommendations on use, maintenance and repair

- Before the installation it shall be controlled that the beams and columns are not damaged during transport or storage. Damaged products shall be replaced by sound ones.
- Never use or try to repair a damaged I-joist.
- Except for cutting to length, I-joist flanges should never be cut, drilled or notched.

If there is a need to modify the construction this may be done if the user-guide still can be followed.



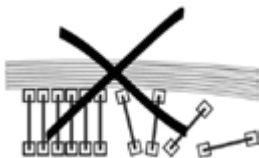
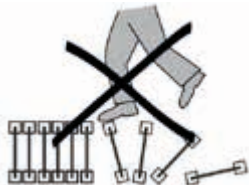
Safety tips

- I-joists are not stable until completely installed, and will not carry any load until fully braced.
- Do not allow workers to walk on I-joists until joists are fully installed and braced, or serious injuries can result. Never stack building materials over unsheathed I-joists.
- Stack only over beams or walls.

User-guide for the beams and columns

The user-guide of the manufacturer shall be followed. Especially the following points shall be noticed:

- The instructions of the manufacturer regarding the restraint of the compression flange and temporary bracing shall be followed. For moment resistance it should be taken into account that the characteristic values apply when the compression flanges are laterally supported at every 350 mm (Hbeams), 600mm (HI-beams) or 1000mm (HB-beams) or less.
- The bearing length to be used shall be > 45 mm.
- Web stiffeners shall be used according to the instructions of the manufacturer.
- During installation, the finished product may be exposed for conditions corresponding to hazard class 3 during a short time before immediate protection against rain.
- The general loading on a Masonite beam should be applied via the top flange. The bottom flange will only work as a support for domestic ceilings and services.

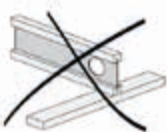


Sorting of packaging

- Plastic covers, straps and caps sorted as combustible material or by local regulations.



These conditions are NOT permitted:



Do not cut holes to close to support.



Do not bevel cut joists top flange beyond inside face of wall.



Do not overhang birdsmouth cut from inside face of plate without reinforcement. Joist flange must bear fully in the plate.



Do not use solid sawn timber for edge binder or blocking. Solid sawn timber may shrink after installation.



Never drill, cut or notch any of the flanges.



Never use a hammer to create access holes for services..





Feel free to contact us ahead of your upcoming project. We can then help you to think in a light, strong and effective!



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