



SK-Beam



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European Technical Assessment	ETA 17/0424 of DD/MM/2018
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GENERAL PART

Technical Assessment Body issuing the European Technical Assessment
State Enterprise "The Technical and Test Institute for Construction Prague"

Trade name of the construction product	SK-Beam
Product family to which the construction product belongs	Product area code: 13 Structural timber products/elements and ancillaries
Manufacturer	OOO «KARKAS KOMPLEKT» Volokalamskoe sh. d. 1, off. 515 125080 Moscow Russian Federation
Manufacturing plant	OOO «KARKAS KOMPLEKT» Moskovskaja oblast Istrinskij rajon Ul. Pervomajskaja, Vladenije 1 Russian Federation
The European Technical Assessment contains	20 pages including 3 Annexes, which form an integral part of this European Technical Assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	ETAG 011, Light Composite Wood-based Beams and Columns, edition January 2002, used as European Assessment Document (EAD)

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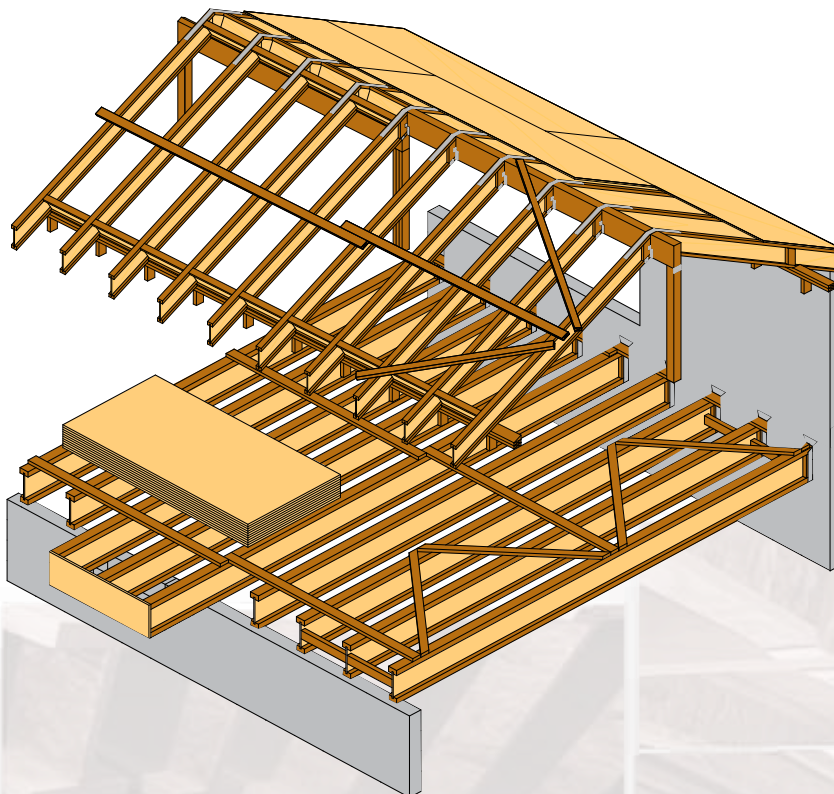
GENERAL

- 1.1. These instructions are designed to make the construction organizations aware of the technology possibility. When designing floorings, walls and roofs of houses we suggest using the data of ETA 17/0424, as well as this instruction. The instructions contain design drawings for rafters, floorings and wall studs, as well as products and materials for the design of rafter and flooring systems of low-rise buildings, based on the use of I-beam systems.
- 1.2. The instructions are a reference book for making decisions and developing projects for beam floorings, coatings and framed walls using wood I-beams.
The designated area of wood I-beams is determined in accordance with the relevant national documents.
- 1.3. When designing floorings, rafter and wall systems from I-beams and studs, the structure nominal size shall be chosen based on the specific conditions of the projected facility, taking into account these instructions from ETA 17/0424.
- 1.4. When designing the instructions of applicable national regulations shall be taken into account:

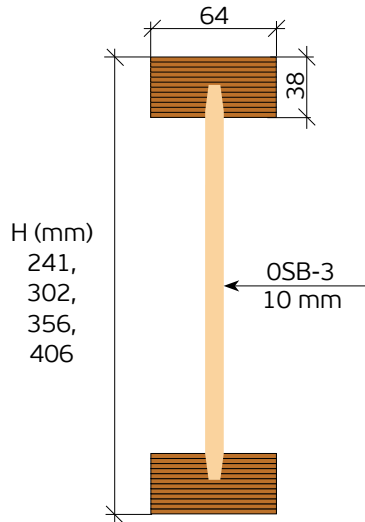
INTRODUCTION

We offer wood SK-Beams with a reinforcement beam made of OSB. The company's products are certified (ETA 17/0424), the components in service have the corresponding European certificates. Beams are designed and manufactured at their own production facilities in the Moscow region and are used as load-supporting units of floorings, rafter structures and framed wall elements for the construction of low-rise residential and public buildings. Wood I-beams are used in houses made of bricks, lightweight concrete block, timber, in frame houses and effectively replace the floorings made of reinforced concrete slabs, timber, boards, steel beams.

Wood I-beams are manufactured based on OSB-3 oriented standard board (10 mm thick), the flanges are made of a board with 38x64 and 38x89 mm sections from the LVL timber. The entire production is controlled by the QCD, which is the guarantor of quality. Samples from each batch of the beams are tested in complex on a special test bench. The formula "LVL+ OSB + LVL" allows to avoid the drawbacks inherent in wood, and due to the I-section, there are high strength properties. The I-beam maintains its stiffness for the entire useful life of the building.



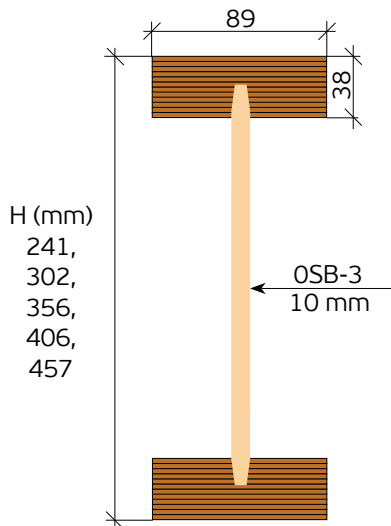
PRODUCT DESCRIPTION



Type: SK-Beam

Height: 241 mm, 302 mm, 356 mm, 406 mm
Flange dimensions: 64 x 38 mm

The SK-Beams are used mainly in projects for residential and commercial construction. Due to their wide flanges, the beams of the SK-Beam model have larger area for nailing and have high strength.



Type: SK-Beam.W

Height: 241 mm, 302 mm, 356 mm, 406 mm, 457 mm
Flange dimensions: 89 x 38 mm

The beams of the SK-Beam.W model are used in buildings with extremely high load or over long spans. Such beams are used mainly in the construction of commercial projects and are ideal for use as rafters.

Types of the beams

Height of the beam H [mm]	Flange dimensions (laminated veneer lumber) width x depth [mm]	
	SK-Beam 64x38	SK-Beam.W 89x38
241	X	X
302	X	X
356	X	X
406	X	X
457	-	X

WOOD FLOORING I-BEAMS

Advantages of I-beam floorings

I-beams in comparison with traditional wood floorings weigh less, cover large spans and do not change geometry with time. Conventional wood floorings from boards are subject to shrinkage, torsion and cracking during the wood drying. As a result, the squeaking and unevenness of the floor appear.

LVL timber connected by special two-component adhesive glue with OSB-3 (high-quality oriented standard board) reinforcement beam is used for the production of SK-Beams. I-beams eliminate the root causes of squeaking, unevenness and unsteadiness of the floor. The result of the beams application is that they are easy to install, cost-effective and guaranteed to be comfortable flooring.

FLOORINGS MADE OF SK-BEAMS, HAVE NUMEROUS ADVANTAGES, THEY ARE:

- **STRAIGHT** - there are no bending moments in the structure, the exact dimensions are provided by the plant's QCD.
- **STIFF** - high weight strength makes it possible to use beams in long spans (up to 10 m).
- **EASY TO INSTALL** by the builders without any special skills.
- **CONVENIENT** - beams are easily transported, mounted without access equipment, are treated by an ordinary carpenter's tool.
- **NOISELESS** - when properly mounted exclude squeaking and unevenness of floors.
- **STABLE** - SK-Beams do not change shape and do not lose physical properties depending on temperature and humidity changes.
- **UNIVERSAL** - using this type of flooring is possible in any type of buildings made of brick, concrete or wood.
- **COST-EFFECTIVE** - high plant efficiency allows minimizing transfer prices.



FLOORING PERFORMANCE CHARACTERISTICS

Various factors that affect the quality and performance characteristics of the flooring are described below. These factors shall be taken into account when designing the flooring system using SK-Beams.

Beams of greater height provide greater stiffness of the flooring, thus reducing the possibility of deflection;

The subfloor is glued and nailed to the beams to ensure greater stiffness of the flooring and to remove the probability of squeaking;

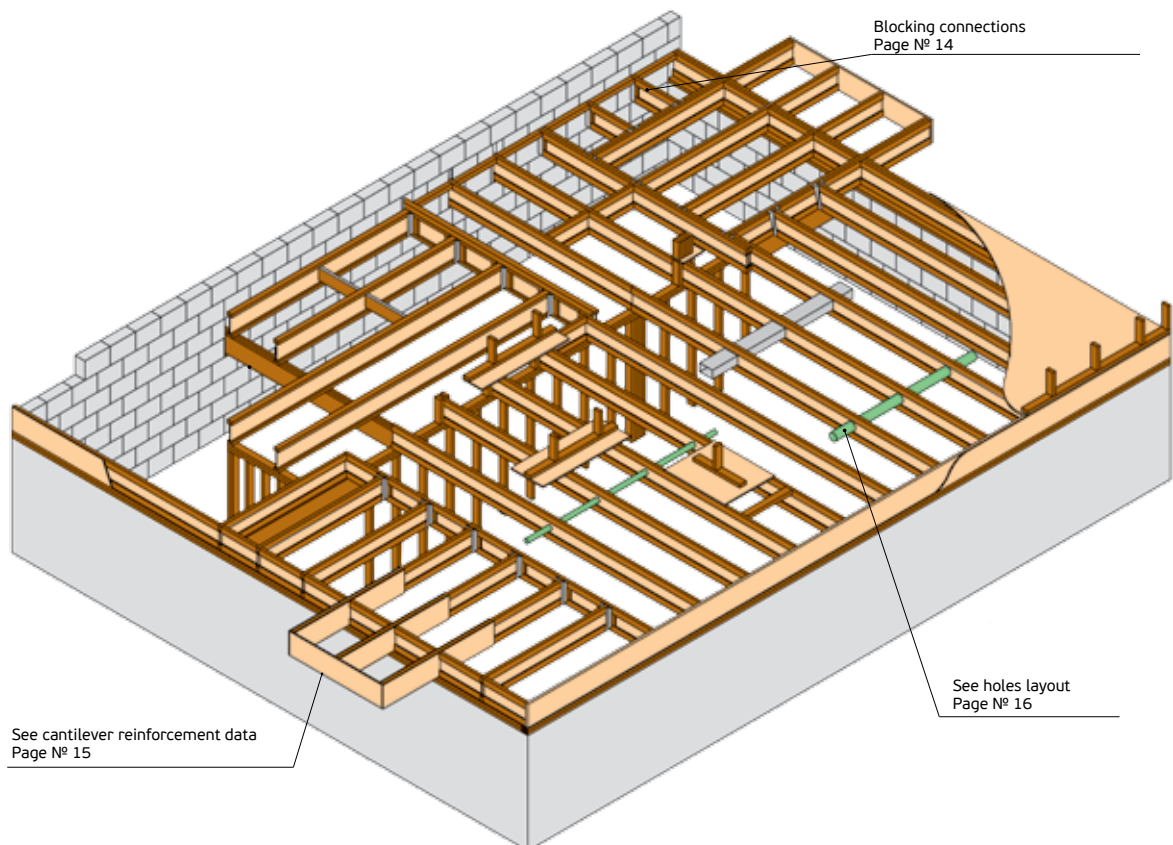
The use of the subfloor materials of at least 18 mm thick improves the flooring quality;

The use of braces, strong blockings, building the ceilings without intermediate elements and ledger, can reduce the level of vibration and improve the overall characteristics of the flooring;

The flooring quality is affected by the location and area of the supports, compliance with the building regulations of fastener technology.

The main physical and mechanical properties of the beams are given in ETA 17/0424

FLOORING APPLICATION

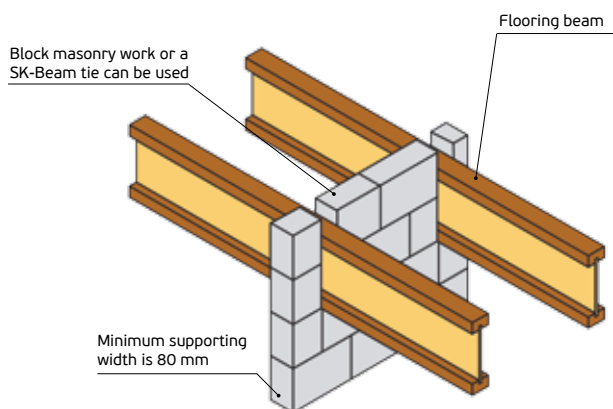


APPLICATION OF I-BEAM FLOORINGS IN THE BUILDINGS WITH BRICK, BLOCK WALLS AND IN THE BUILDINGS MADE OF CAST REINFORCED CONCRETE

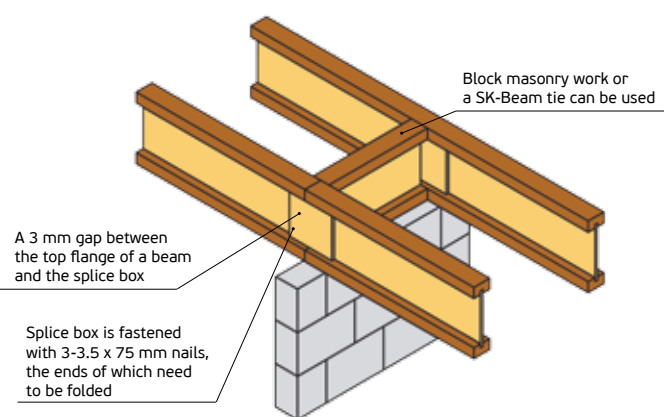
When there is the perpendicular junction of an I-beam to a brick or block wall, two types of connections are used, the seat connection or the connection on the bands. (Figure K3, K4)

1. Seat connection — the beam rests on the supporting surface of the wall. The minimum supporting area for exterior walls is 45 mm (Figure K3). For interior walls it is 80 mm (Figure K1, K2).
2. Connection on the bands — the beam rests on the supporting surface of the band fixed to the wall (Figure K4) with the help of the fasteners corresponding to the masonry type.

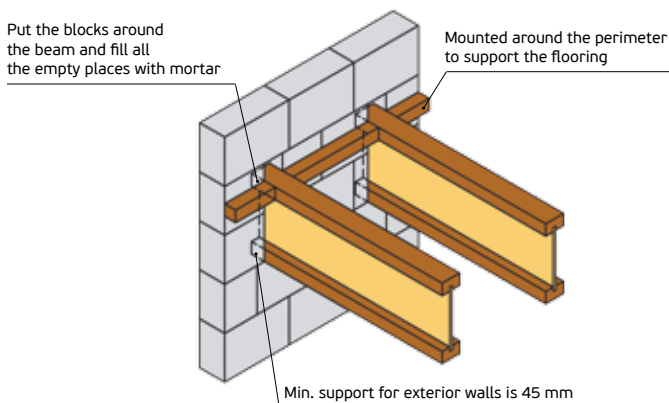
K1 Flooring I-beam supporting to a wall



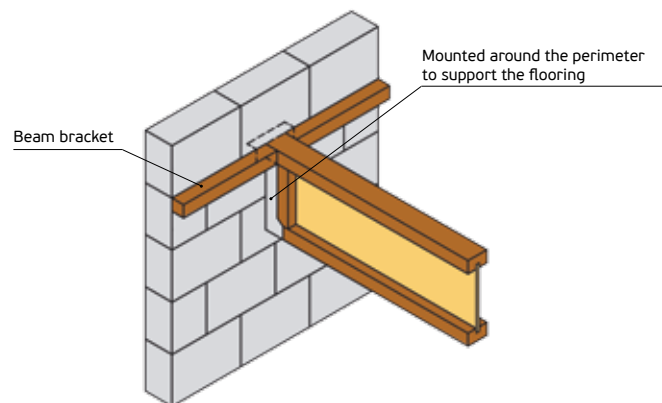
K2 Flooring I-beam supporting to a wall



K3 Seat connection



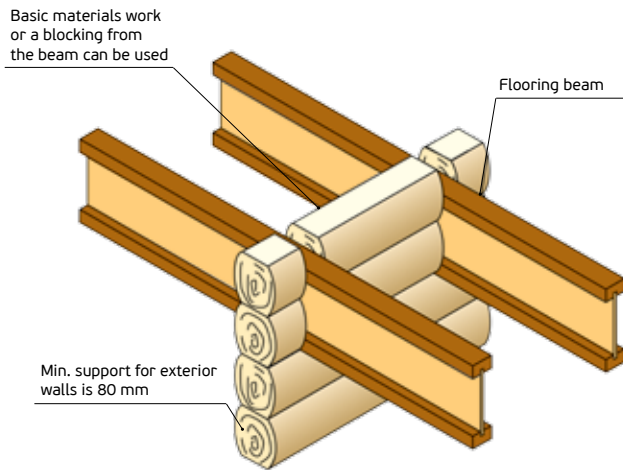
K4 Connection using bracket



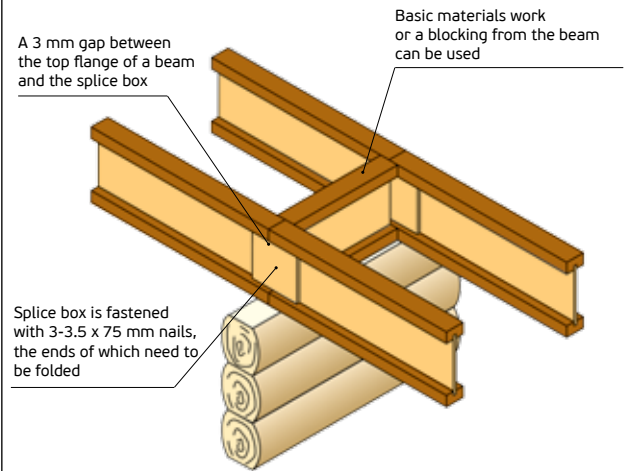
APPLICATION OF I-BEAM FLOORINGS IN THE BUILDINGS WITH BAR-SHAPED OR LOG WALLS

Rules for application of I-beams in wood buildings, such as in brick and block ones. The minimum supporting area for exterior walls is 45 mm (Fig. B3). For interior walls it is 80 mm (Figure B1, B2). Beams and bands are attached to the walls by nails or self-tapping screws. To improve the strength of connections and the quality of the floors, joints are recommended to be glued with elastomeric glue.

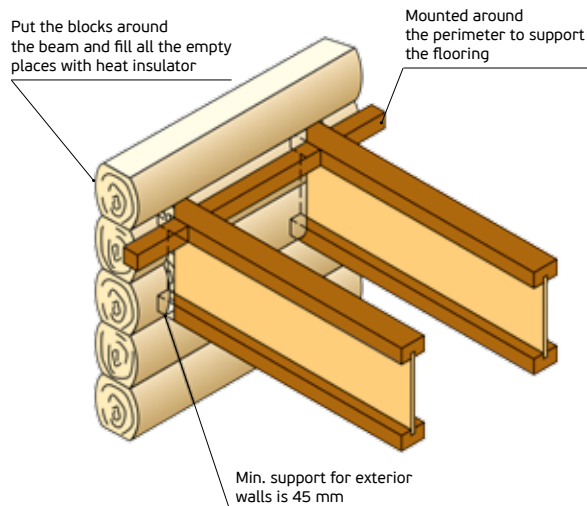
B1 Flooring I-beam supporting to a wall



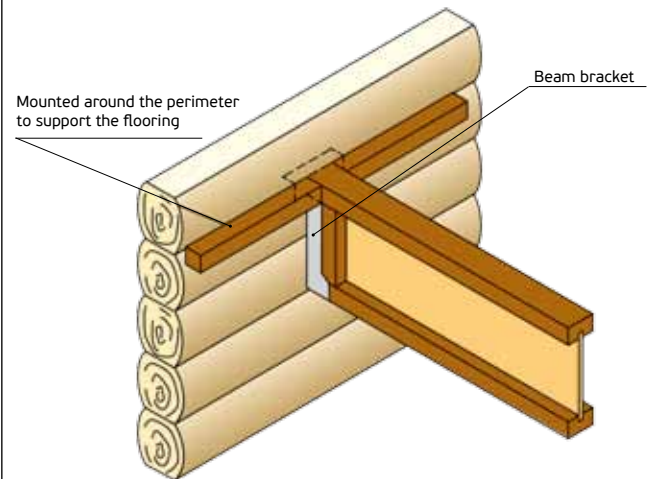
B2 Flooring I-beam supporting to a wall



B 3 Seat connection

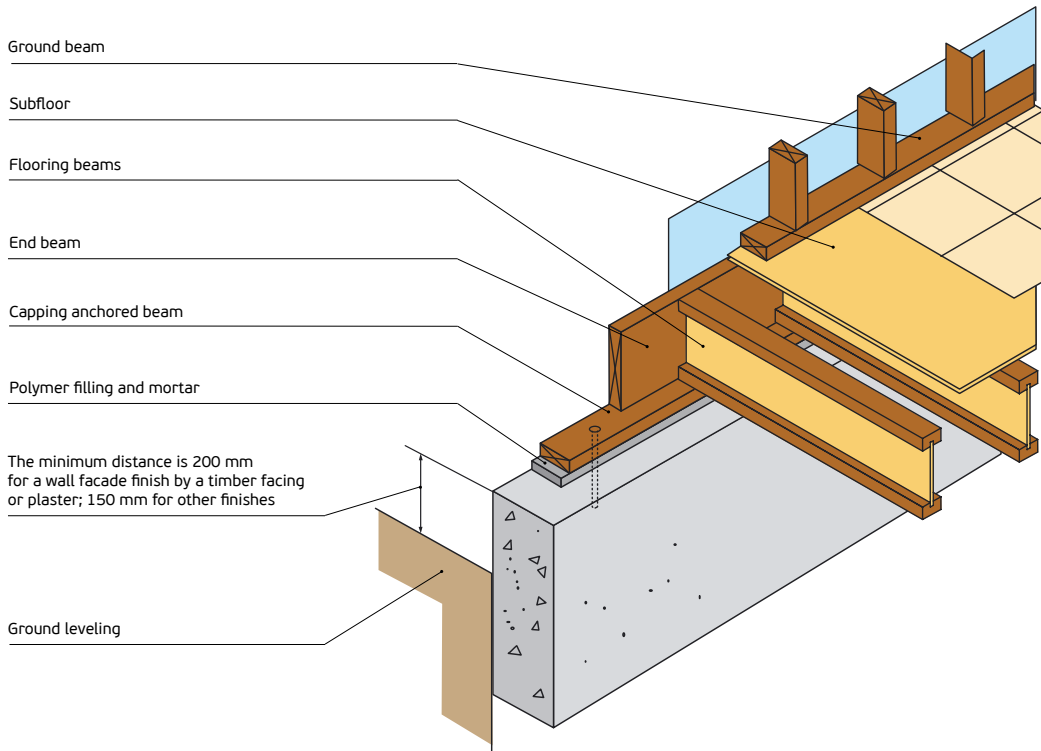


B 4 Connection using bracket

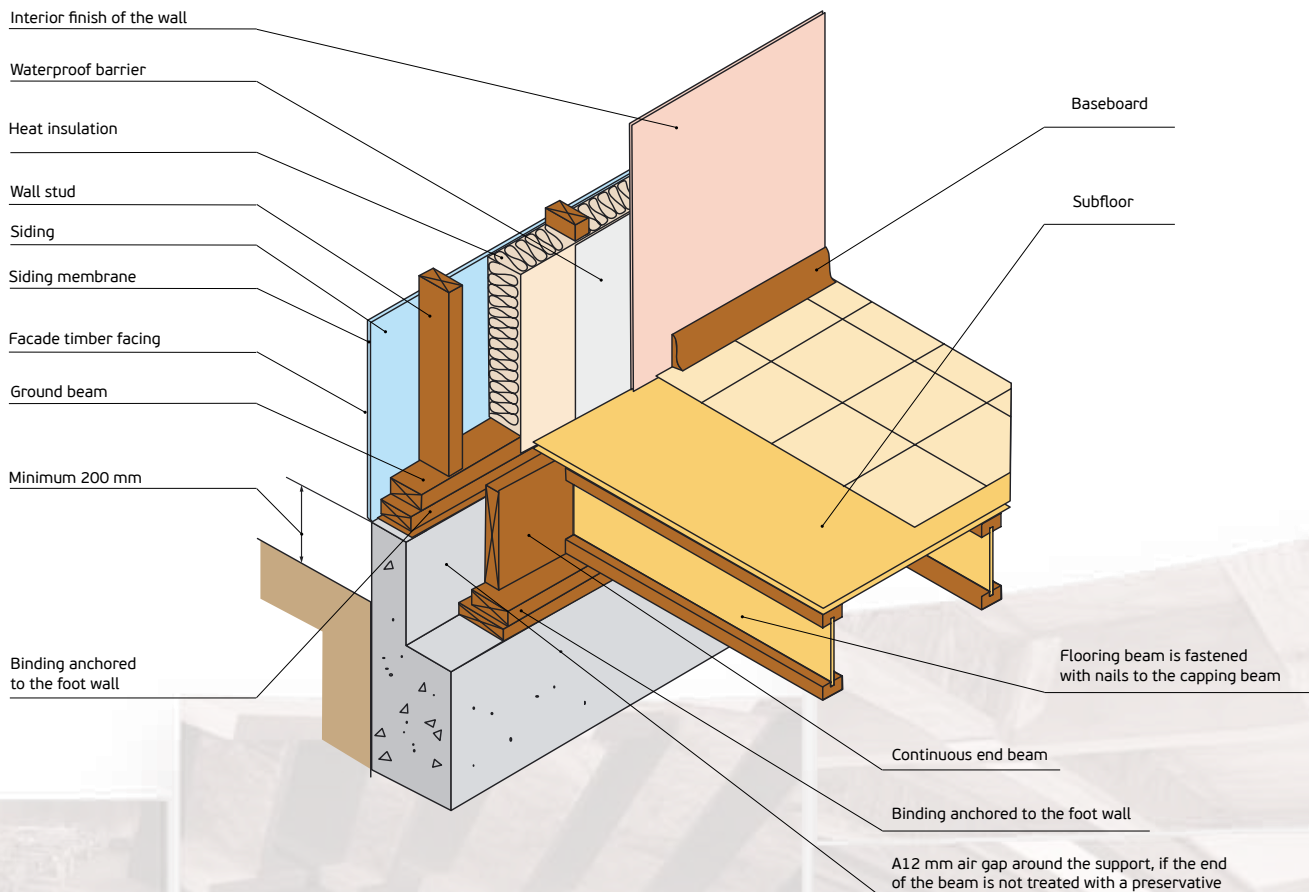


UNITS SUPPORTING I-BEAMS ON FOUNDATIONS

1. Units supporting on the capping beam used in the platform frame.



2. Flooring beams rest on the recessed in the concrete bench. Beams are fastened with nails to the end beam and the binding. The binding anchors to the top of the foot wall with anchor bolts. The ground binding of the wall studs is fastened to the main binding on 75 mm nails after each 400 mm.

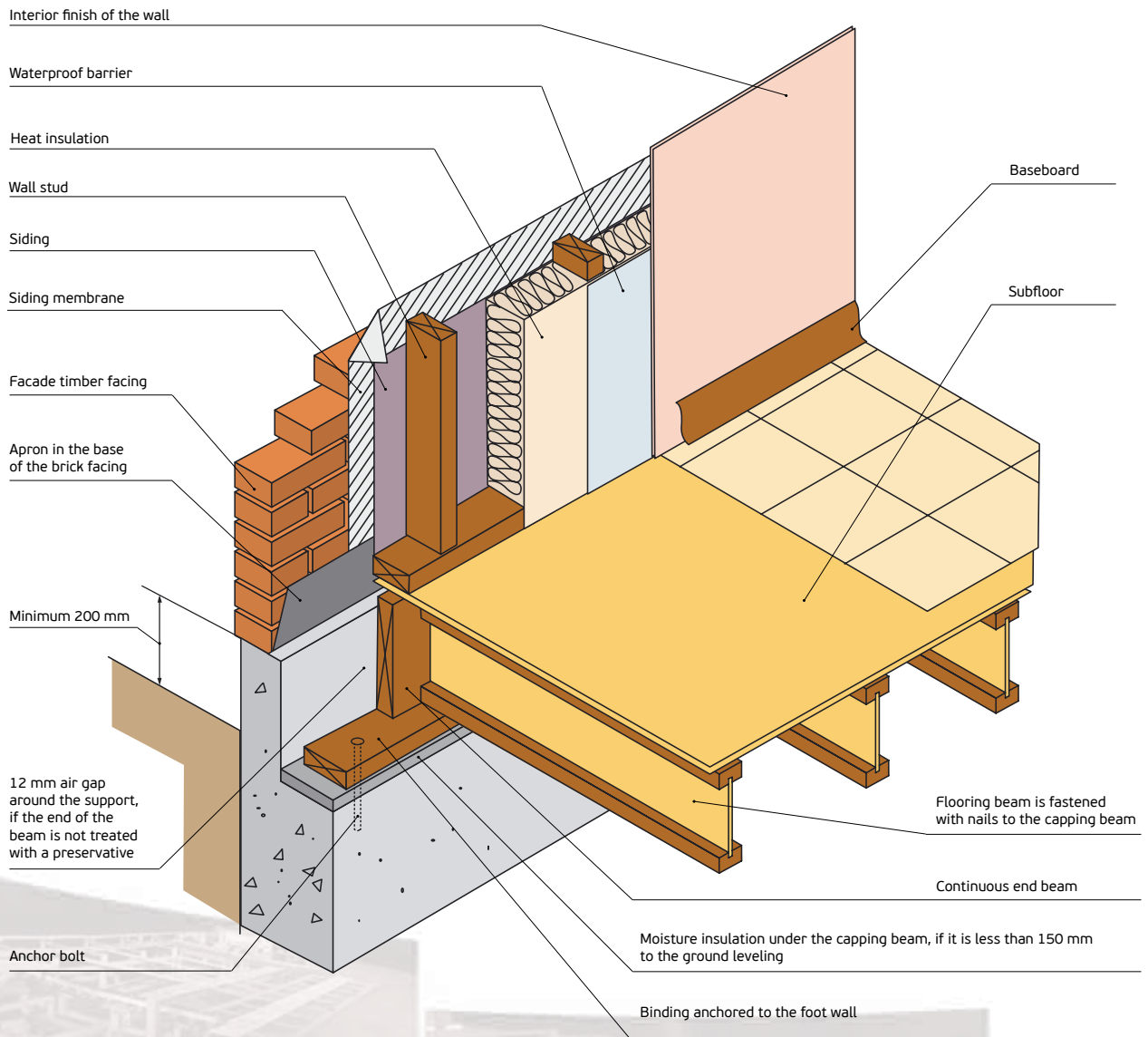


UNITS SUPPORTING I-BEAMS ON FOUNDATIONS



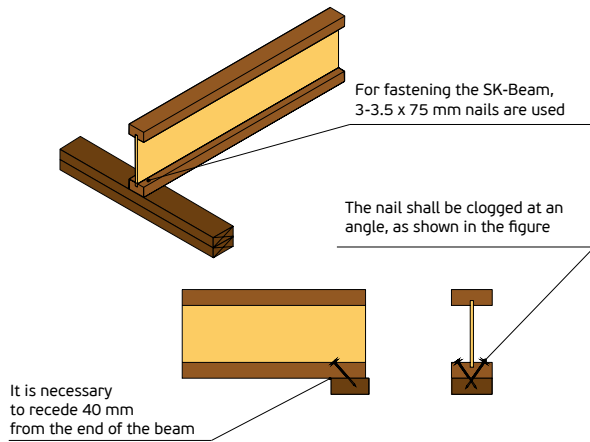
Supporting the binding is applicable both with walls of monolithic concrete, and from small-element concrete blocks. The unit consists of a wooden capping beam reinforced with anchors to the wall (Fig. 1), on which the flooring beams and the end main beam rest. The capping beam is usually located at the top of the wall. In this case, its bottom shall be at a height of not less than 150 mm from the ground leveling. If you want to lower the floor level of the ground floor, the width of the wall top can be reduced to 90 mm. At the same time, depending on the exterior finish of the wall, there are two types of them. If the finish of the walls consists of an external siding or plaster, the frame of the wall is put on a separate binding anchored at the top of the wall, and the flooring beams are supported by another binding located lower on the flange formed in the concrete (Fig. 2). If the wall is made of finishing bricks, the brick is laid on the raised part of the foot wall, and the wooden frame rests on top of the flooring (Fig.).

3. Flooring beams rest on the recessed in the concrete bench. Beams are fastened with nails to the end beam and the binding. Brick facade finish rests on the top of the foot wall. The frame of the wall is installed on the flooring deck.



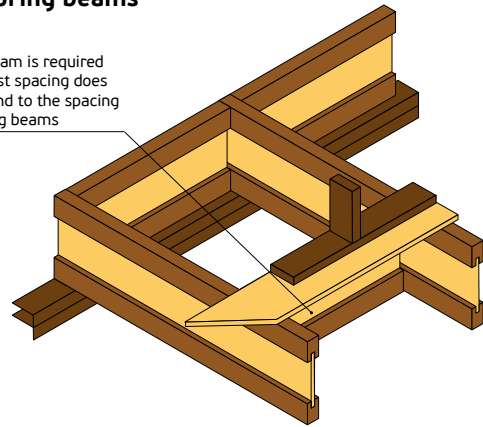


1 Nailed fastening of beams (SK-Beam/SK-Beam.W)

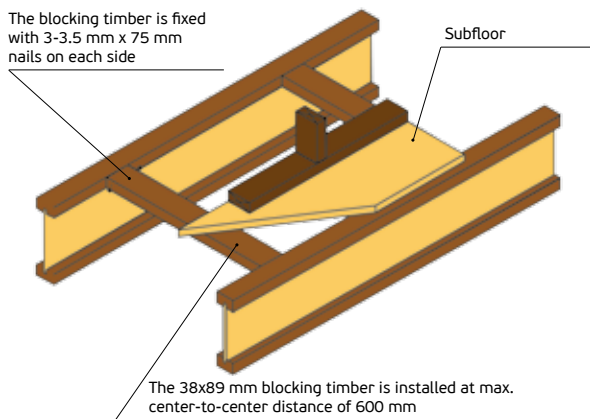


2 Interior supporting wall perpendicular to the flooring beams

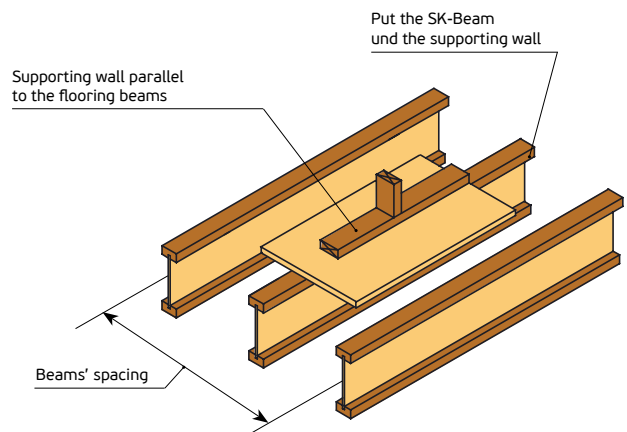
A blocking beam is required if the wall post spacing does not correspond to the spacing of the flooring beams



3 Non-load supporting walls parallel to beams

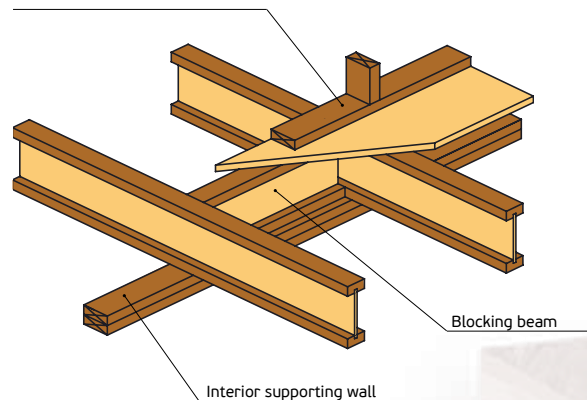


4 Supporting wall parallel to the flooring beams



5 Blocking of beams on interior supporting walls

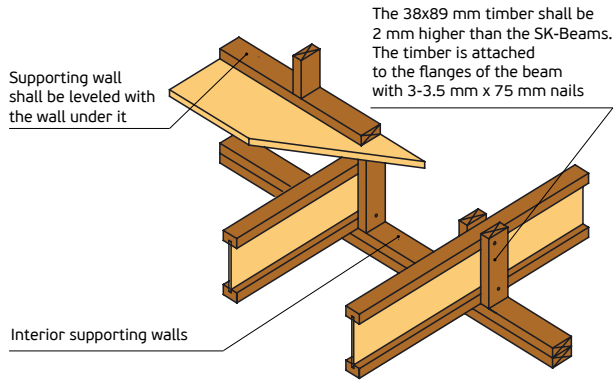
Supporting wall shall be leveled with the wall under it



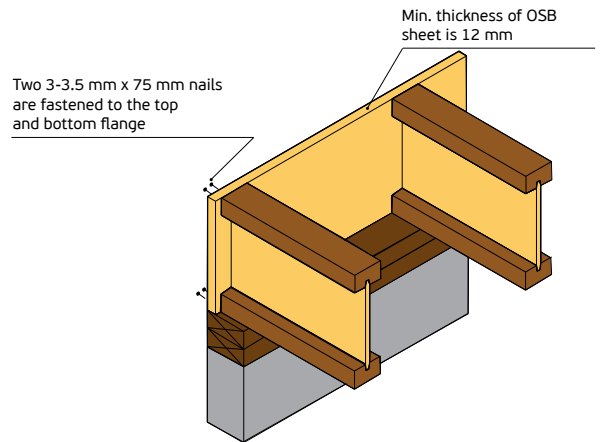
FLOORING UNIT CONNECTIONS



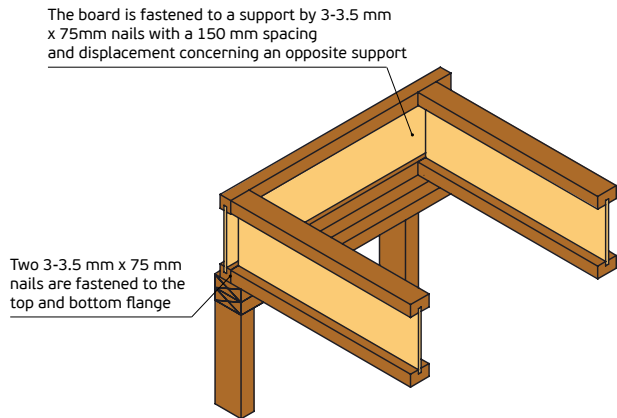
6 Blocking of beams on interior supporting walls (compression unit)



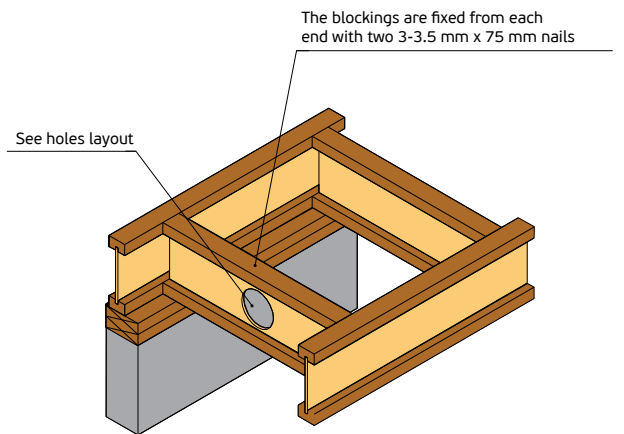
7 Fastening of a capping board



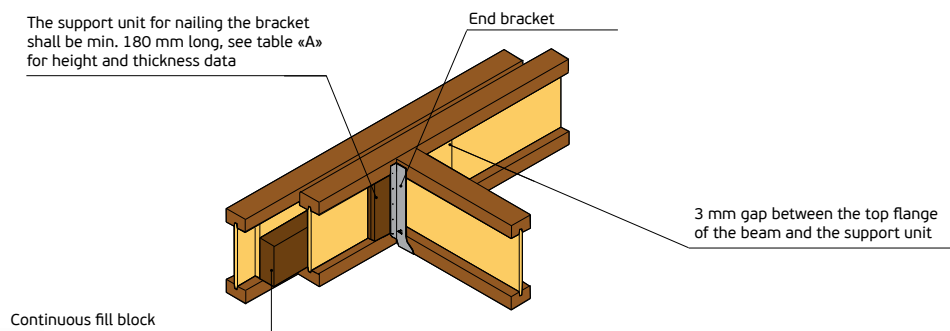
8 Fastening of a capping board



9 Blocking connections



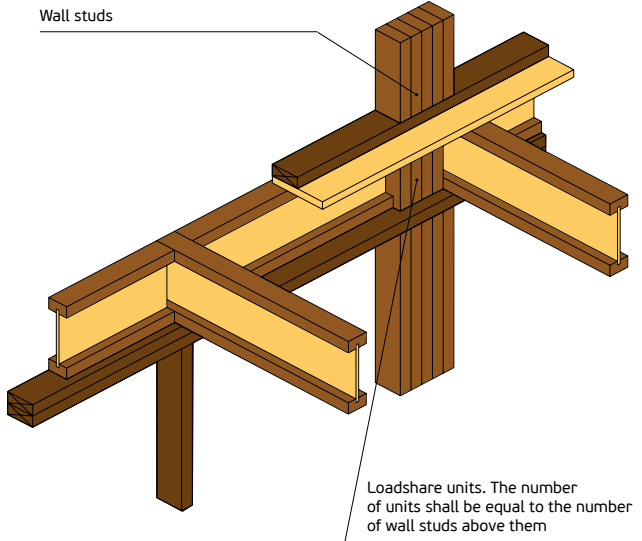
10 End fastening of beams (SK-Beam/SK-Beam.W)



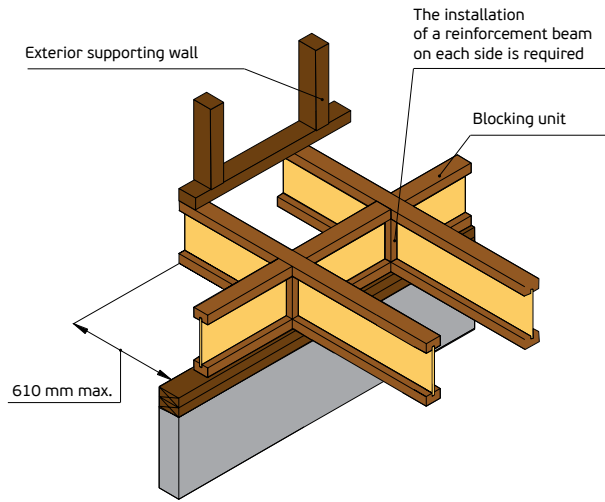
FLOORING UNIT CONNECTIONS



12 Loadshare unit for wall studs



13 Cantilever arrangement (SK-Beam/SK-Beam.W)

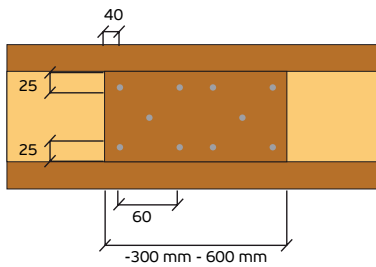


Type of beam		Sizes of bearing block		Block dimensions/shim	
		Thickness	Altitude (max.)	Thickness	Altitude
SK-Beam	241	28	162	55	140
SK-Beam	302	28	223	55	200
SK-Beam	356	28	277	55	250
SK-Beam	406	28	327	55	300
SK-Beam.W	241	38	162	80	140
SK-Beam.W	302	38	223	80	200
SK-Beam.W	356	38	277	80	250
SK-Beam.W	406	38	327	80	300
SK-Beam.W	457	38	378	80	350

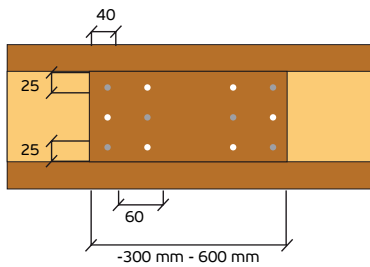


NAILED FASTENING COMPONENTS OF THE SUPPORT UNIT AND THE FILL BLOCK

SK-Beam

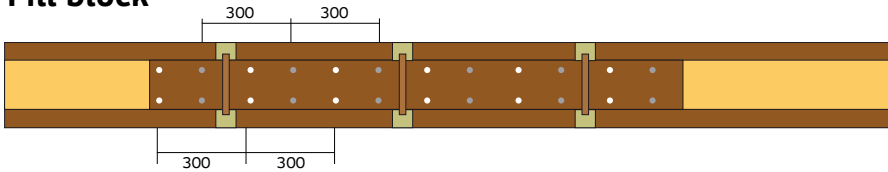


SK-Beam.W



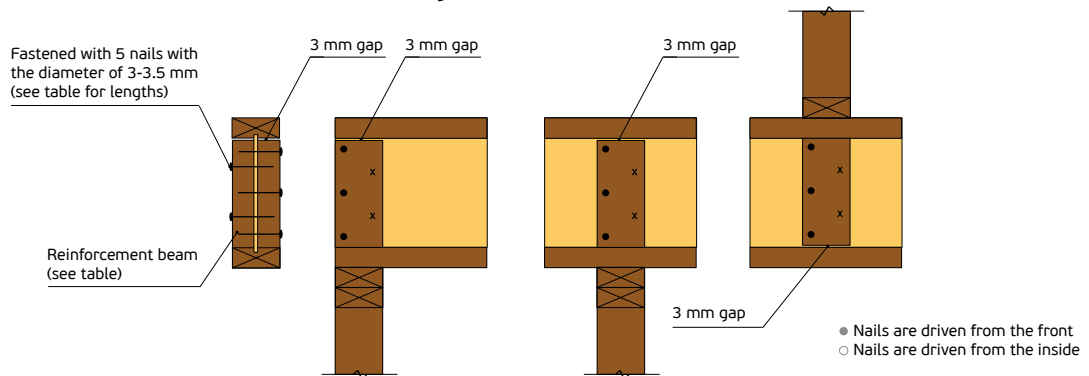
- Nails are driven from the front
- Nails are driven from the inside

Fill block



- With multiple incoming loads, a continuous fill block shall be used
- In addition, a continuous support unit may be required
- When using a continuous fill block, ensure that 2 rows of nails are fastened at 300 mm intervals on each side
- Nails are driven from the front
- Nails are driven from the inside

Wall reinforcement beam fastening



Beam type	Flooring	Rafter	Nail length
SK-Beam	Min. thickness is 18 mm	Min. thickness is 18 mm	75 mm
SK-Beam.W	Timber 38x90	Timber 38x90	90 mm

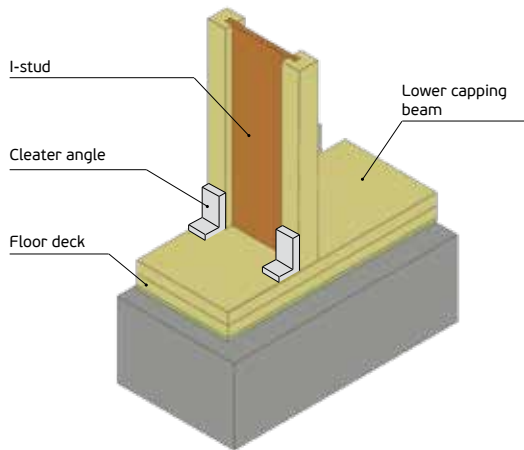
The holes layout is given in ETA 17/0424.



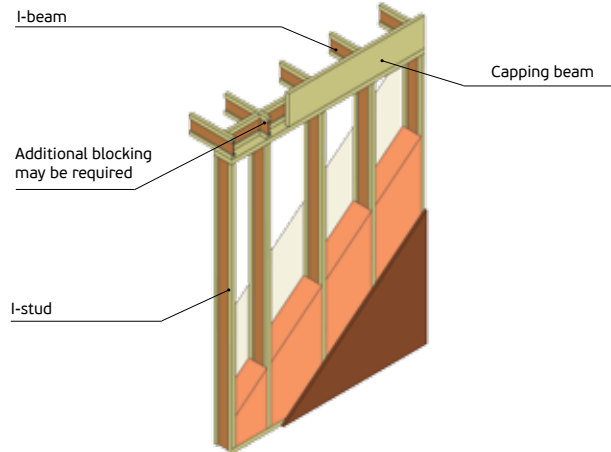
I-BEAMS IN THE WALL PANELS OF FRAME HOUSES

The use of I-beams with a reinforcement bam from the OSB in wall panels provides 4 times more stiff structure of the walls, in comparison with the usual wood-framed walls. As a result, a frame house or a cottage made according to Canadian technology is strong and light, and its construction is cheap and fast.

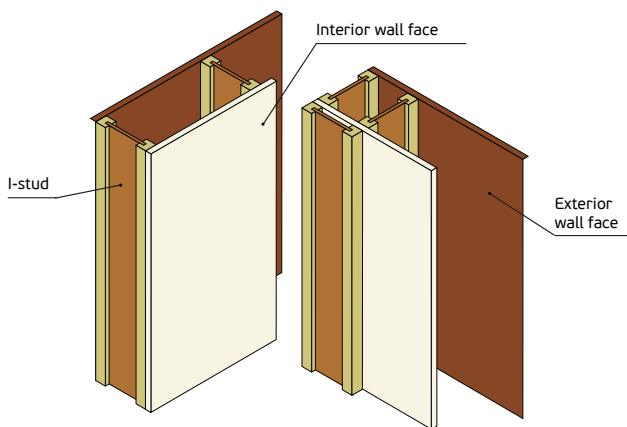
1 Wall fastening in the basement



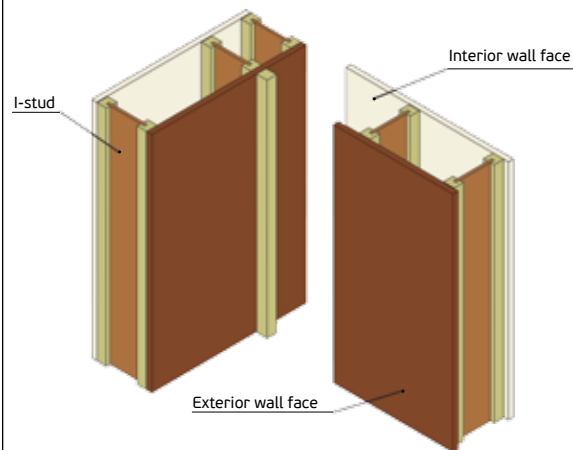
2 Wall fastening to interflooring



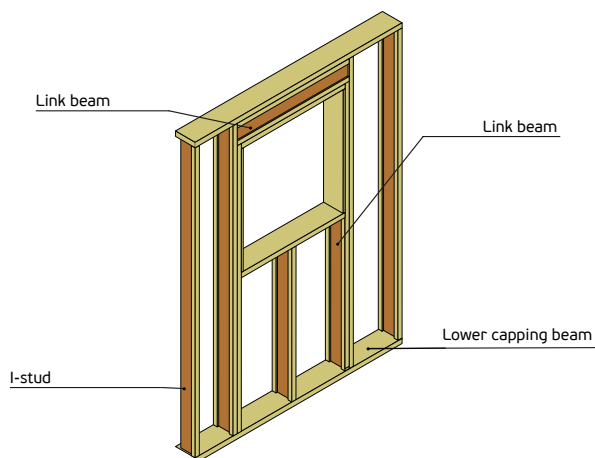
3 Corner connection of exterior walls



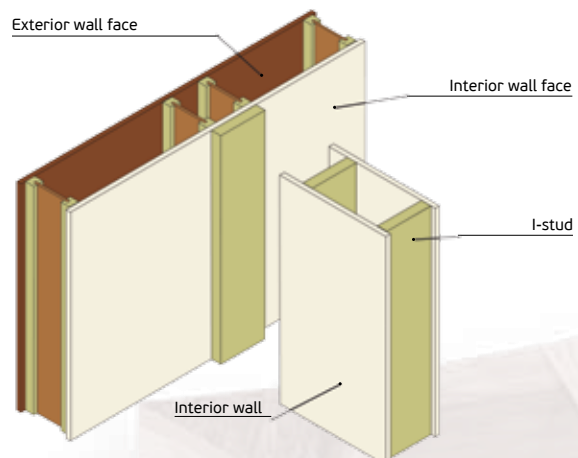
4 Corner connection of exterior walls



5 Wall opening



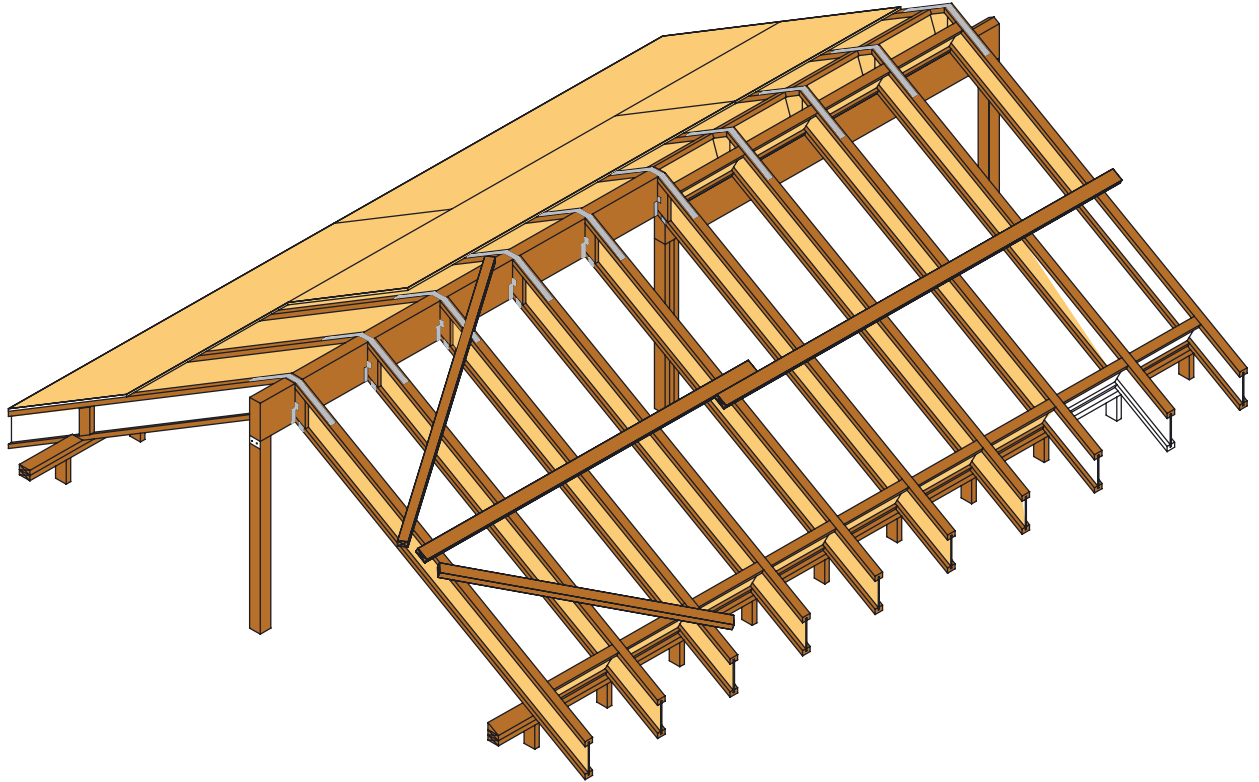
6 End fastening of an interior and exterior wall



RAFTER SYSTEM

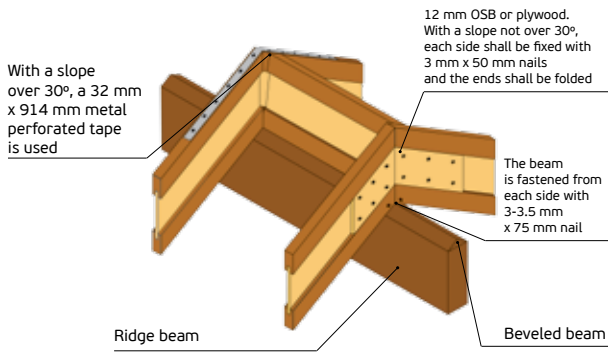
Wood SK-Beams due to their physical properties and precise dimensions are used as rafters for roofing while building houses.

The beams are not exposed to the environment, they do not contract, do not twist, they do not strain and do not bend. Therefore, the rafter systems made of I-beams are long-lasting, strong and serve as a good basis for the finish coating.

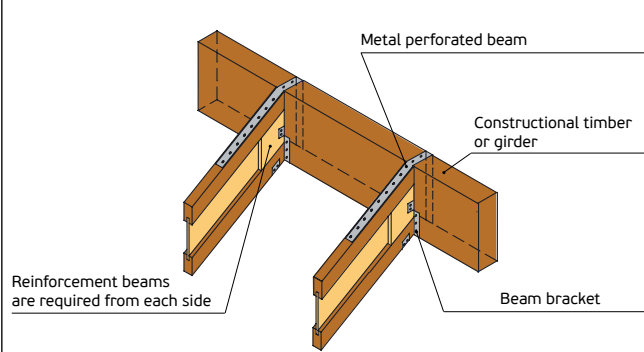


UNIT CONNECTIONS

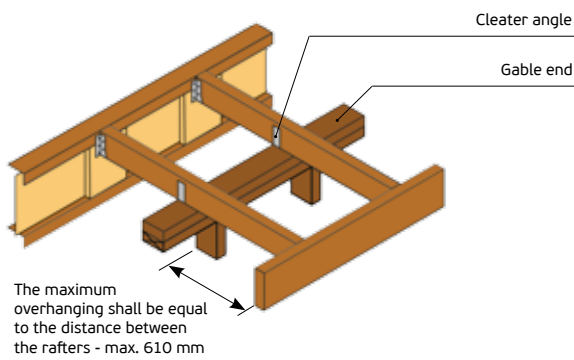
C 1 Rafters fastening on a ridge beam



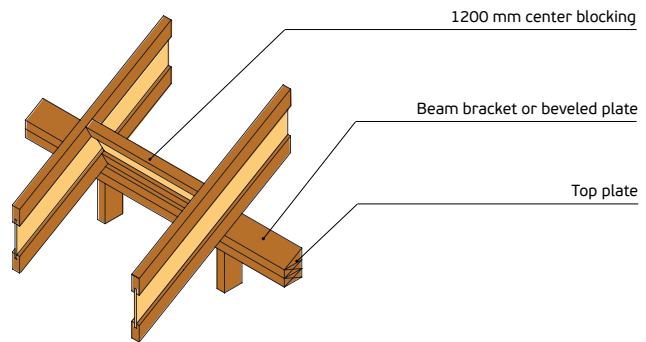
C 2 Joint with a collar beam for the slope over 30°



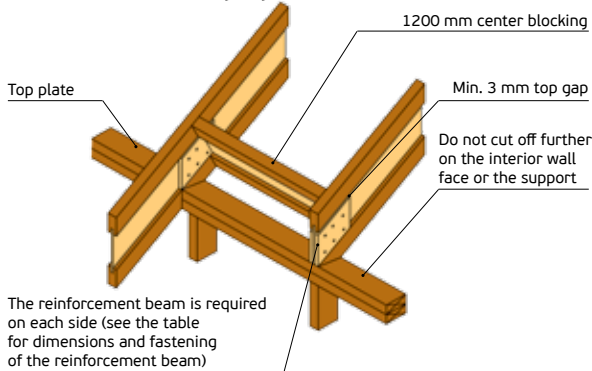
C 3 Barge overhanging (SK-Beam/SK-Beam.W)



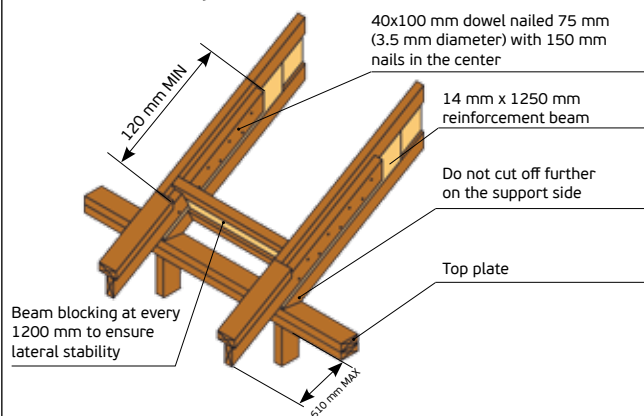
C 4 Eave overhanging



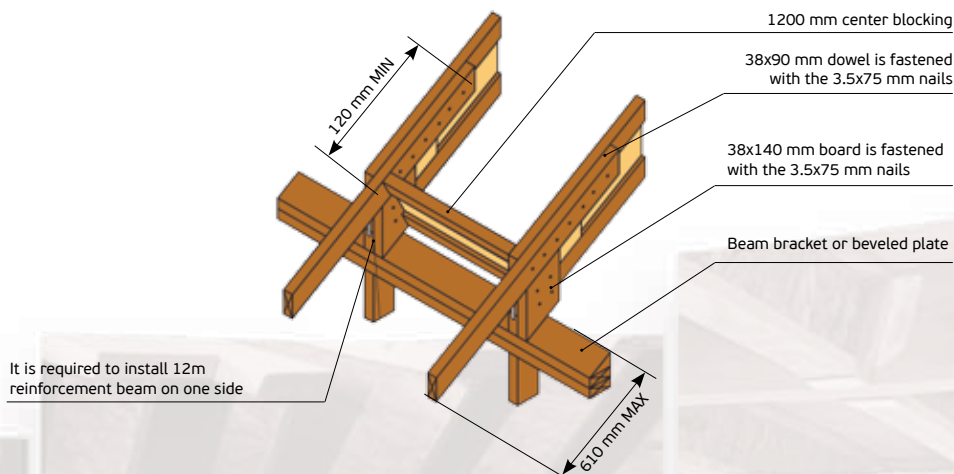
C 5 Eave overhanging



C 6 Dowel arrangement for the slope over 30°



C 7 Dowel arrangement for the slope over 30°



FASTENERS FOR SK-BEAMS

Frame unit connections are fixed by means of galvanized nail connectors, anchors and special fasteners. Fasteners can be divided into several groups. The first group is used to connect two wooden elements. The second one is used for the connection of a stone structure and a wooden element, as well as elements of special group application.

Range of fasteners:

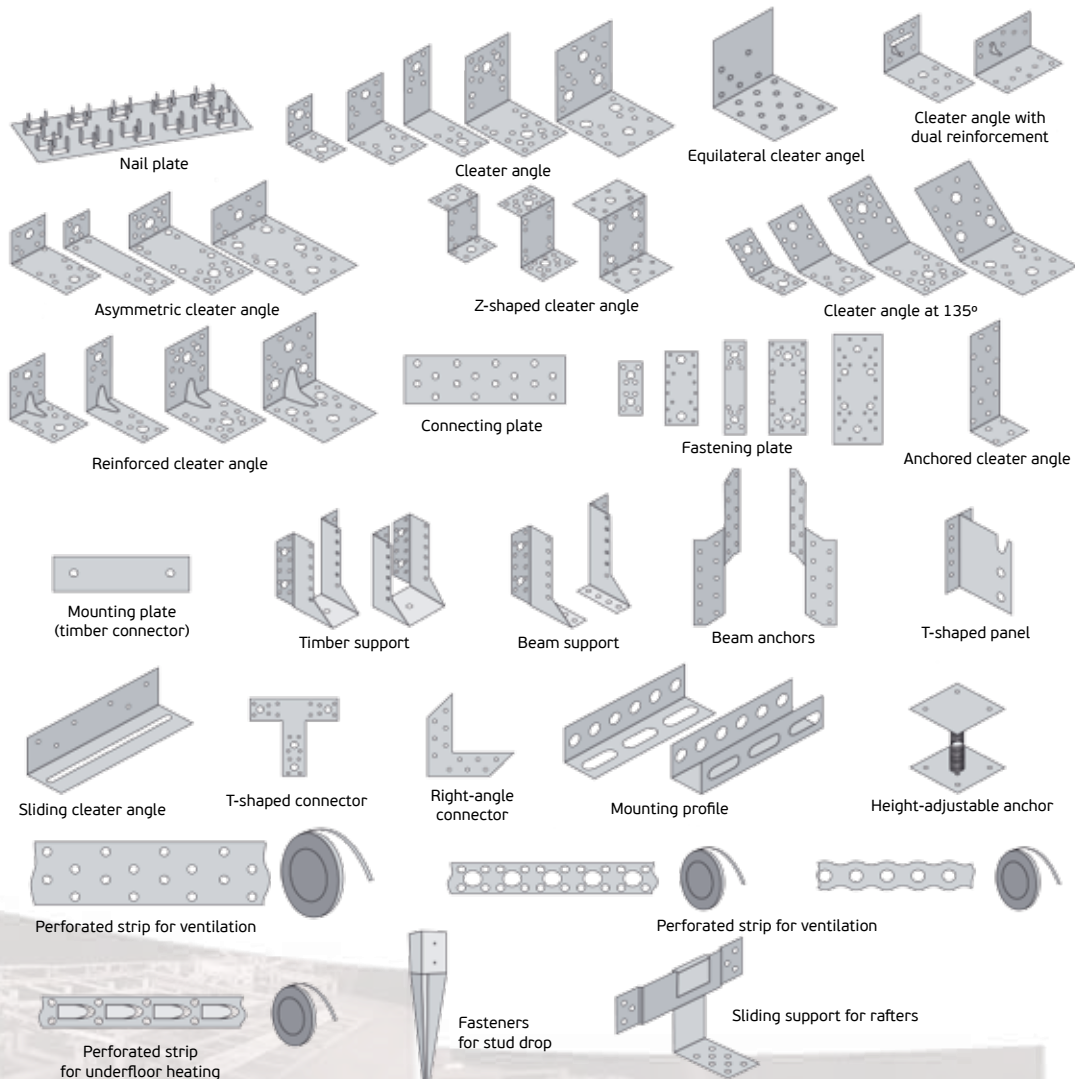
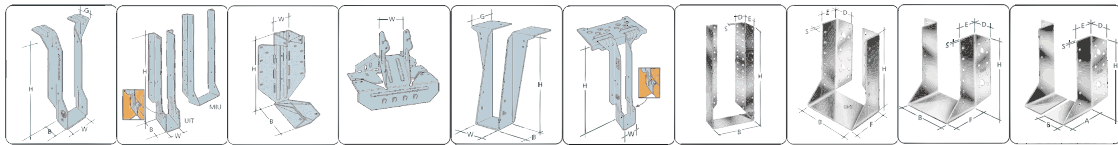
Fasteners for heavy loads designed to fix the beam with a beam, or beams and masonry

- Fastenings for small loads, designed for connecting wooden elements

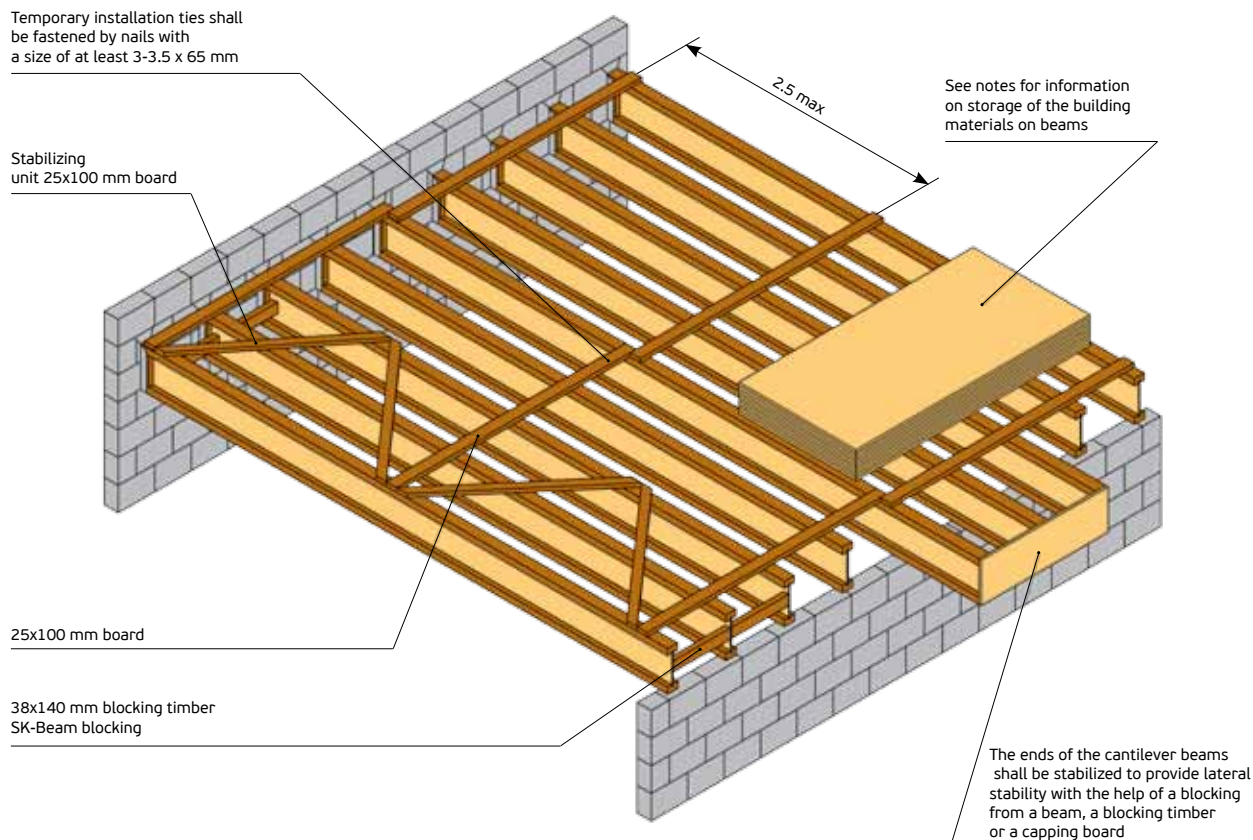
Nail plates for wiring connections

- Angle couplings
- Anchoring elements for fixing beams and rafters

Beam brackets



TEMPORARY INSTALLATION TIES



Note on temporary installation ties

In flooring systems with diagonal ties, wooden blocks shall be used in each span of beams, as well as on cantilever supports.

If solid beams are used on internal supports, install blocks on these supports if the total length of the beam exceeds 6.0 m.

If the end of the beam rests on the inner support, fix the two sets of beams with nails. Stabilizing blocks are fastened to 3 blocks and shall cover a distance of at least 1.2 m. The I-beams shall be installed straight and vertical, the maximum deviation from the forward position (slope) shall not exceed 10 mm, and the maximum deviation from the vertical position shall not exceed 3 mm.

When working with wood I-beams, it is important to comply with all requirements for installation procedures.

To ensure safety at a construction site, the following rules shall be observed: Do not walk on loose beams.

Do not store building materials on loose beams.

Storage of building materials on the beams is allowed only after all ties have been installed. Materials shall be spread out at least 4 beams at a distance of not more than 1.0 m from the support. The maximum load per beam shall not exceed 150 kg.

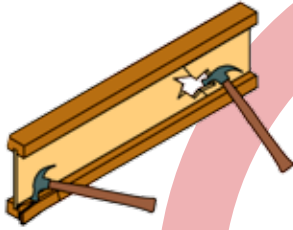
Fully secure wood I-beams with temporary installation ties (longitudinal ties, diagonal ties, stabilizing blocking, subfloor) to give stability to the flooring during installation.

The lateral stability of I-beams is provided by the system of diagonal ties. Temporary installation ties shall be installed and fastened with nails in accordance with the instructions.

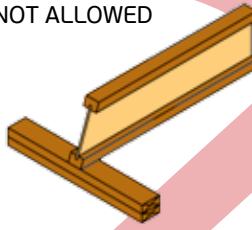
An increase in the load on the flooring is allowed only after the floor deck is completely fixed to the beams. The ends of the cantilever beams shall be stabilized to provide lateral stability.

STORAGE AND TRANSPORTATION REGULATIONS

DO NOT HAMMER ON STUDS AND FLANGES



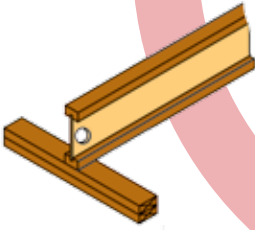
BEAM BEVELING BEHIND THE INTERIOR WALL FACE IS NOT ALLOWED



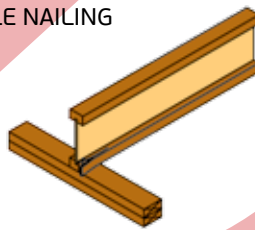
DO NOT WALK ON LOOSE BEAMS



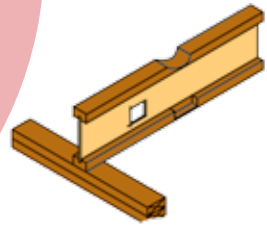
DO NOT HOLE IN THE STUD OVER THE SUPPORT



DO NOT ALLOW THE FORMATION OF CRACKS IN THE FLANGE WHILE NAILING



DO NOT DRILL TOO LARGE HOLES IN THE STUD



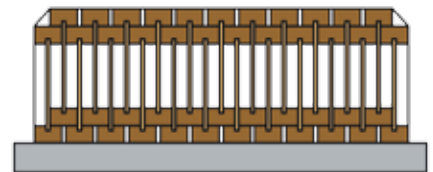
DO NOT NOTCH TOP AND BOTTOM FLANGES

DO NOT STORE BEAMS FLAT



Protect the beams from the weather impact (sunlight, wind and rain).When unloading the beams in bundles, use suitable access equipment for this purpose

When storing, lay the beams on the ribs



In order to keep the beams clean and above ground level, use supports at a distance of 3m.

When transporting, lay the beams on the ribs, do not lay them flat

