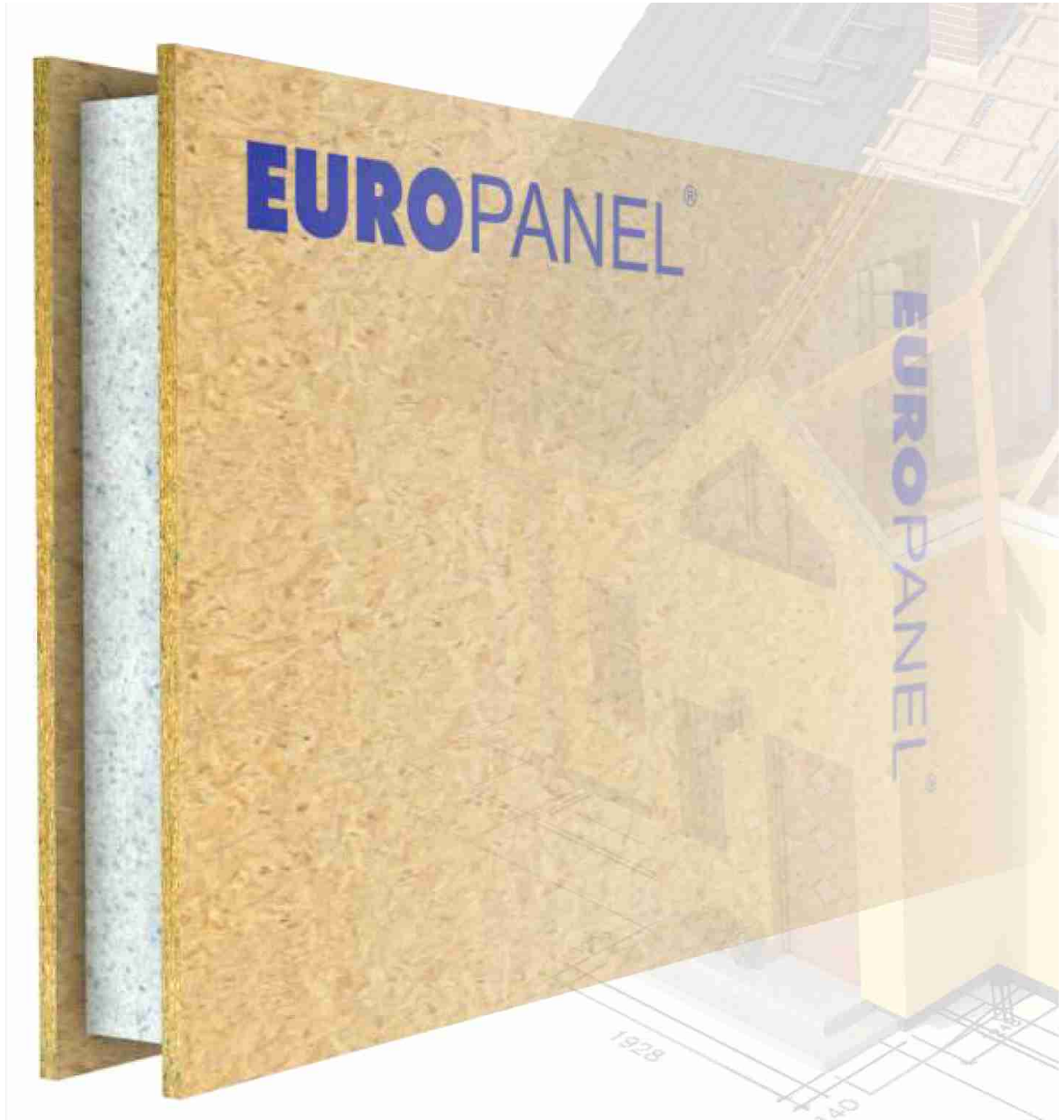


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CE

EUROPANEL Construction System

Easy Solution for Construction Projects

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Intended as a bearing or non-bearing
element of wall, floor, ceiling and roof
structure

17

1390-CPR-0454/2017/P

ETA 16/0508
ETAG 019

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1 EUROPANEL Construction System

Easy Solution for Construction Projects

EUROPANEL is a versatile construction system made of flat construction parts with excellent mechanical, thermal and technical properties. It has been tested for many years of use. It is made of materials of the highest quality classes. It is very light and easy to process. It does not require any special equipment or expert knowledge of construction workers. The unique properties of the EUROPANEL panels reduce the construction costs, shipping costs; they simplify the logistics of construction works, and thus increase the productivity of construction companies.

1.1 Prefabricated sandwich panels

The basic element of the system - the panel, is made by gluing OSB boards with a core from stabilized self-extinguishing polystyrene. The panel has a 42 mm deep groove, which is formed by overlapping the OSB boards over the polystyrene core, and it is used to make panel joints or lining in the place of windows and doors.

	
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2 Technical Description of EUROPANEL

2.1 Structure, dimensions and basic physical properties of the panels

The Europanel structural insulated panels (SIP) are bearing prefabricated sandwich wood-based panels for use as a supporting component of wall, floor, ceiling and roof structures. The panel consists of a core block of expanded polystyrene which is covered with chipboard OSB boards on both sides that form a rigid structure together with the core. The individual layers are connected with polyurethane adhesive.

The Europanel panels have two basic type series in the Profi variant (EP) and in the Hobby variant (H). The Profi series is designed for professional use in industrial and residential constructions. The Hobby series is designed for self-construction of smaller buildings, household buildings or small holiday homes. The assortment listing of the Europanel panels is shown in Table 1.

The supporting panels are manufactured in the basic type of dimensions of 1250 x 3000 mm from which the further widths of panels - 312 mm, 415 mm and 625 mm are derived. The panels are manufactured in the widths of 120 mm, 170 mm, 210 mm a 270 mm for interior bearing walls, circumferential bearing walls, floor structures and roof coatings. The Profi panels are manufactured in the design with openings for electrical installations (version A) and without cutouts for electrical installations (version B).

The Hobby panels are manufactured in the basic type of dimensions of 1250 x 2500 mm from which the further width of panels 625 mm is derived. The Hobby panels are manufactured in the thickness of 65 mm a 85 mm without cutouts for electrical installations.

Type	Use	Variant		Dimensions			Thickness EPS [mm]	Weight 1 m ² [kg]	Thermal transmittance U [W/m ² .K]	Thermal resistance R [m ² .K/W]
				Thickness [mm]	Length [mm]	Width [mm]				
EP 120	Panel for interior bearing walls	A	B	120	2500 2650 2800 3000	312 415 625 1250	90	20,3	0,36	2,59
EP 120		GA	GB						0,31	3,11
EP 170	Panel for circumferential	A	B	170			140	20,8	0,25	3,87
EP 170		GA	GB						0,21	4,67
EP 210	Panel for floors and roof cladding	A	B	210			180	21,49	0,20	4,90
EP 210		GA	GB						0,16	5,92
EP 270	Panel for floor and roof cladding	A	B	270			240	22,4	0,15	6,44
EP 270		GA	GB						0,13	7,79
EP 65	Panel for small buildings	H	H	65	2500	325 1250	40	15,4	-	-
EP 85		H	H	85			60	15,7	-	-
Explanations: A Panel with openings for el. installation GA Panel Grafit with openings for el. installation B Panel without opening for el. installation GB Panel Grafit without openings for el. installation H Panel Hobby determ. for small buildings										

Table 1: Assortment of EUROPANEL panels

2.2 Connecting panels

The connecting panels are of the height of 80 mm, the widths for individual series are 90 mm, 140 mm, 180 mm and 240 mm, and they are manufactured in the length of 2920 mm and 1250 mm. The connecting panels are also provided with openings for electrical installations.

2.3 Wooden connecting elements

The wooden connecting elements are designed for the EP 170, EP 210 and EP 270 series and for the Hobby EP 65 H and EP 85 H panels series with the thickness of 80 mm and of the length of 4000 mm (eventually in accordance with individual needs) of the width of 140 mm, 180 mm and 240 mm for the Profi panels series and they are in the width of 40 mm and 60 mm for the Hobby panels series.

The wooden connecting elements are not provided with openings for electrical installation.

2.4 Embedded components

The embedded components for the reinforcement of edges are manufactured with the basic thickness of 40 mm and in the widths of 40 mm, 60 mm, 90 mm, 140 mm, 180 mm and 240 mm and in the lengths of 3000 mm or 4000 mm. The embedded components for the reinforcement of edges are not provided with openings for electrical installation.

Type	Use	Variant		Dimensions			Thickness EPS [mm]	Weight 1 m ² [kg]
				Thickness [mm]	Length [mm]	Width [mm]		
SP 90	Connecting panel	A / GA	B / GB	80	1250 2920	90	60	4,6
SP 140	Connecting panel					140	110	4,8
SP 180	Connecting panel					180	150	4,9
SP 240	Connecting panel					240	210	5,1
VP 40/90 D	Inserted element	-	B	40	3000 4000	90	-	5,0
VP 40/140 D	Inserted element			40		140	-	7,7 9,9
VP 80/140 D	Inserted element doubled			80		140	-	15,3 20,3
VP 40/180 D	Inserted element			40		180	-	13,1
VP 80/180 D	Inserted element doubled			80		180	-	19,4 26,1
VP 40/240 D	Inserted element			40		240	-	17,1
VP 80/240 D	Inserted element doubled			80		240	-	34,7
VP 40/40 D	Inserted element			40		40	-	2,3
VP 80/40 D	Inserted element doubled			80		40	-	4,5
VP 40/60 D	Inserted element			40		60	-	3,2
VP 80/60 D	Inserted element doubled			80		60	-	6,3
Explanations: A Panel with openings for el. installation GA Panel Grafit with openings for el. installation								
B Panel without openings for el. installation GB Panel Grafit without openings for el. installation								

Table 2: Assortment of EUROPANEL connecting panels and embedded elements

2.5 Mechanical connecting elements

For mechanical connection of panel joints by means of a connecting panel or a double inserted element, the galvanized steel clips with the prescribed thickness of 1.8 mm and the length of 44 mm are determined, eventually galvanized screws with shallow head screws 4 x 40 mm. The mechanical connection elements at the endings of the panels by means of an inserted element are galvanized steel clips, eventually galvanized screws with shallow head screws 4 x 40 mm.

2.6 Chemical connecting elements

The one-component polyurethane (PU) thermally and acoustically insulating adhesive is used for the chemical connection of panels that is always applied for wood – wood connection or wood – OSB board connection. The polyurethane (PU) assembly foam is used for the chemical connection of the panels that is also used for sealing and thermal insulation of joints in the connection of polystyrene – polystyrene elements, wood – polystyrene or OSB board – polystyrene elements, then in connection between the boards of individual panels and for sealing and thermal insulation of joints between the panel structure and wooden structural elements.

3 Uses of EUROPANEL

The Europanel panels are intended for use as bearing or non-bearing elements of wall, floor, ceiling and roof structures. A static assessment has to be made for each element. These elements can be used in the classes 1 and 2, in accordance with EN 1995-1-1.

4 Assumed working life of the construction product

The provisions of ETA are based on the assumed life expectancy of 50 years for the Europanel product installation into a building in case that these bearing sandwich wood-based panels are properly used and maintained. These provisions are based on the current level of knowledge and the available knowledge and experience.

The data listed as life expectancy of the construction product cannot be interpreted as a guarantee that the manufacturer or their representative provide, neither EOTA, nor the authority for technical assessment (TAB) but they are rather understood as a tool for choosing the right criteria for bearing sandwich wood-based panels in connection with the expected, economically justified durability of the structures.

5 Selected mechanical and physical properties

The EUROPANEL construction system has a wide range of properties defined in ETA 16/0508 and other manufacturer's documentation. The following paragraphs show the selected system properties.

5.1 Static parameters of the panels

The static characteristics of the panels are determined by their thickness, length and thickness of the used OSB boards. The specific values are in the static manual. The table below lists the ranges of selected parameters for individual panel thicknesses.

Thickness of the panel	Vertical bearing capacity		
/mm/	Wall /kN.m ⁻¹ /	Ceiling /kN.m ⁻² /	Roof /kN.m ⁻² /
85	30,45 – 56,25	1,64 – 1,96	1,7 – 2,78
120	46,88 – 70,31	2,35 – 2,82	2,43 – 3,99
170	46,88 – 70,31	3,46 – 4,15	3,58 – 5,86
210	46,88 – 70,31	4,34 – 5,21	4,5 – 7,37
270	46,88 – 70,31	5,67 – 6,81	5,87 – 9,63

Table 3: Selected statistical characteristics of the panels

5.2 Resistance to fire

Reaction to fire of materials and components

The classification of the reaction of the material to fire according to EN 13501-1+A1 is for thermal insulation EPS, class E. The material in the form of OSB boards and wooden structural elements is classified according to the reaction to fire, class D-s2, d0, under the given conditions.

Resistance to fire

The classification of the resistance to fire according to the norm EN 13501-2+A1 for the panels with the thickness of 120, 170, 210 and 270 is REI 20.

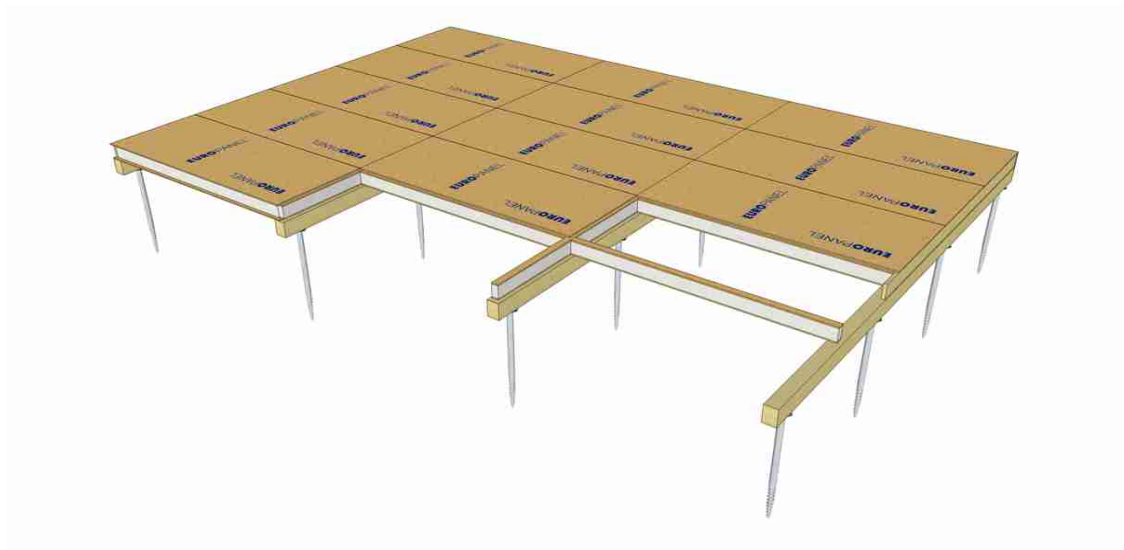
5.3 Airborne sound insulation of the panel wall

The airborne sound insulation is measured according to EN ISO 10140-2 and is evaluated according to EN ISO 717-1. The weighted sound insulation of the EP 170 panel is $R_w (C; C_{tr}) = 30 (-2; -4)$ dB.

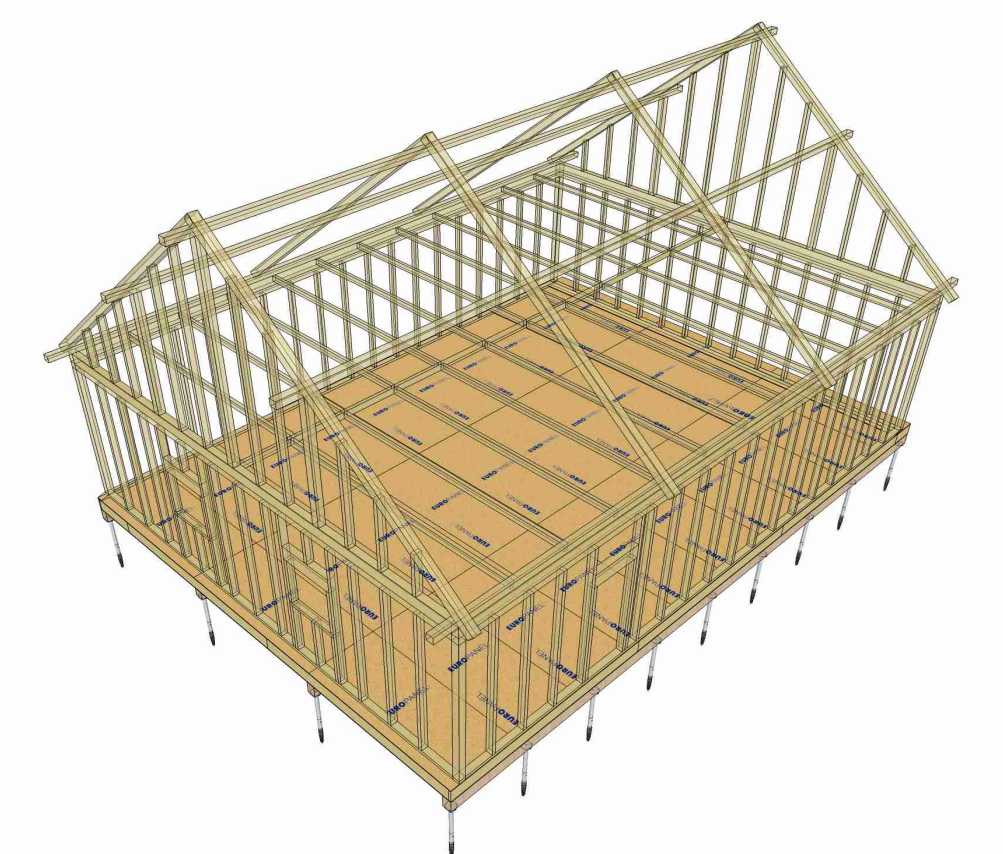
5.4 Thermal technical parameters of the panels

Panel type	Heat transfer coefficient U [W/m ² .K]	
	EPS F	GREYWALL
EP 65	0,70	0,60
EP 85	0,51	0,44
EP 120	0,36	0,31
EP 170	0,25	0,21
EP 210	0,20	0,16
EP 270	0,15	0,13

6 Examples of EUROPANEL structures



Picture 1: Structure of the EUROPANEL foundation plate on ground screws

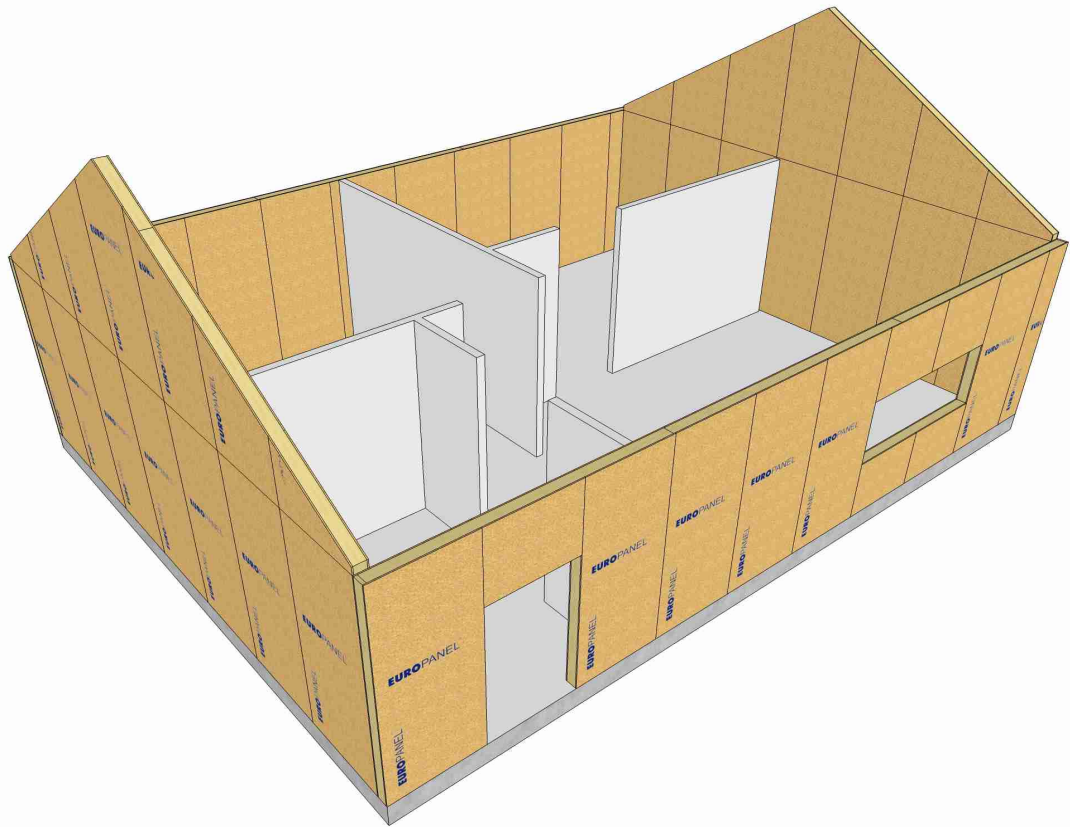


Picture 2: Example of using foundation plate from EUROPANEL

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Picture 3: Construction of circumferential walls from EUROPANEL

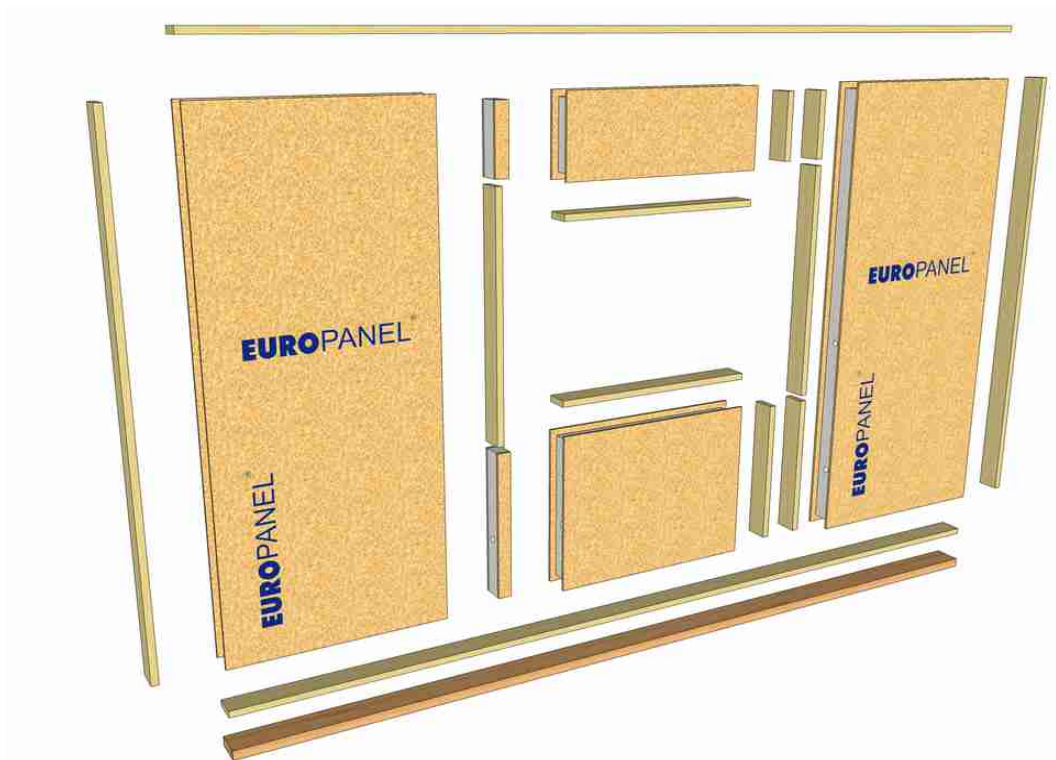


Picture 4: Construction of a full wall

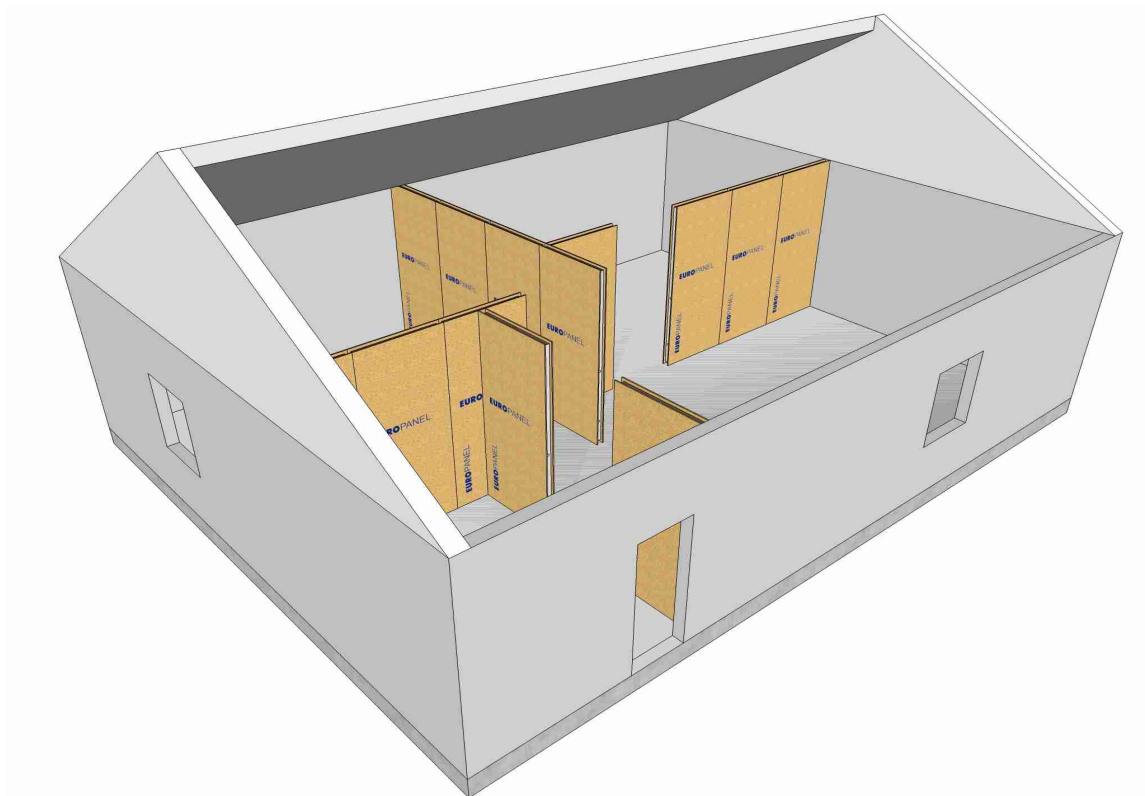
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Picture 5: Construction of a wall with window opening

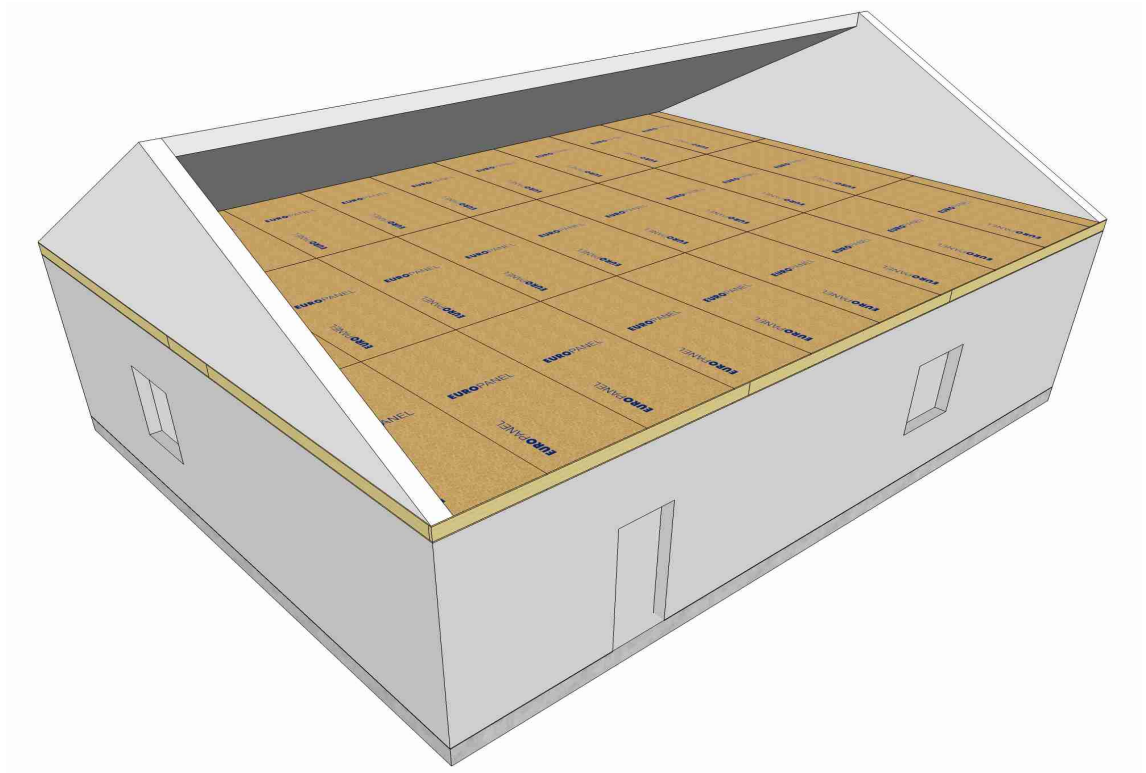


Picture 6: Inner bearing walls

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Picture 7: Ceiling from EUROPANEL

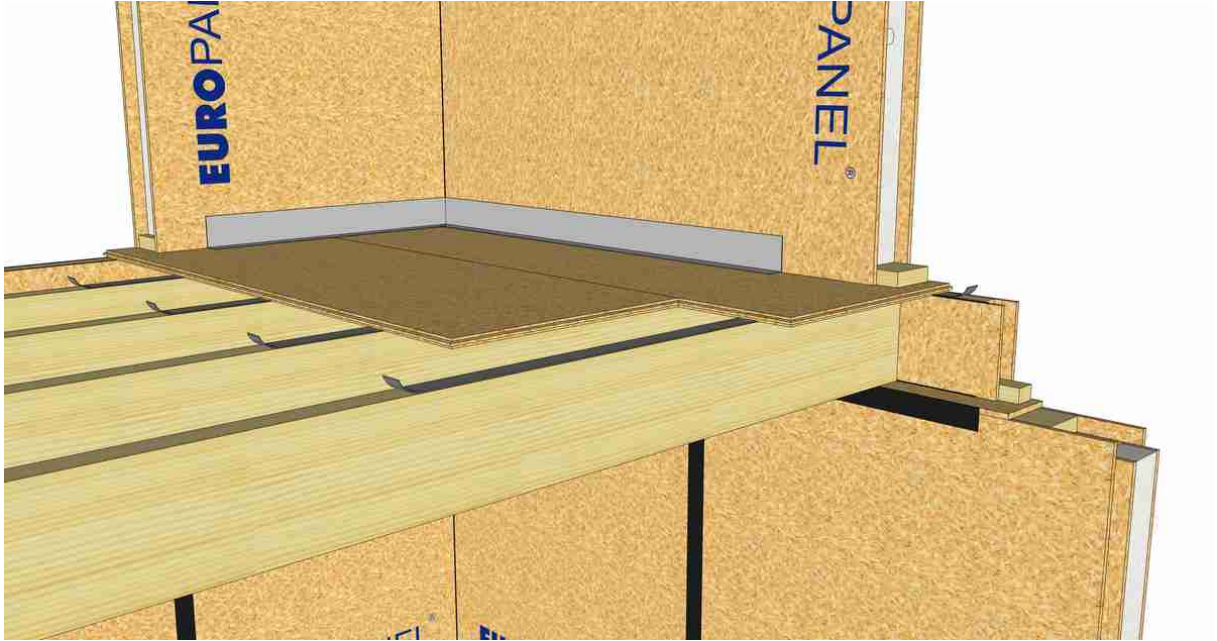


Picture 8: ceiling structure from EUROPANEL panels

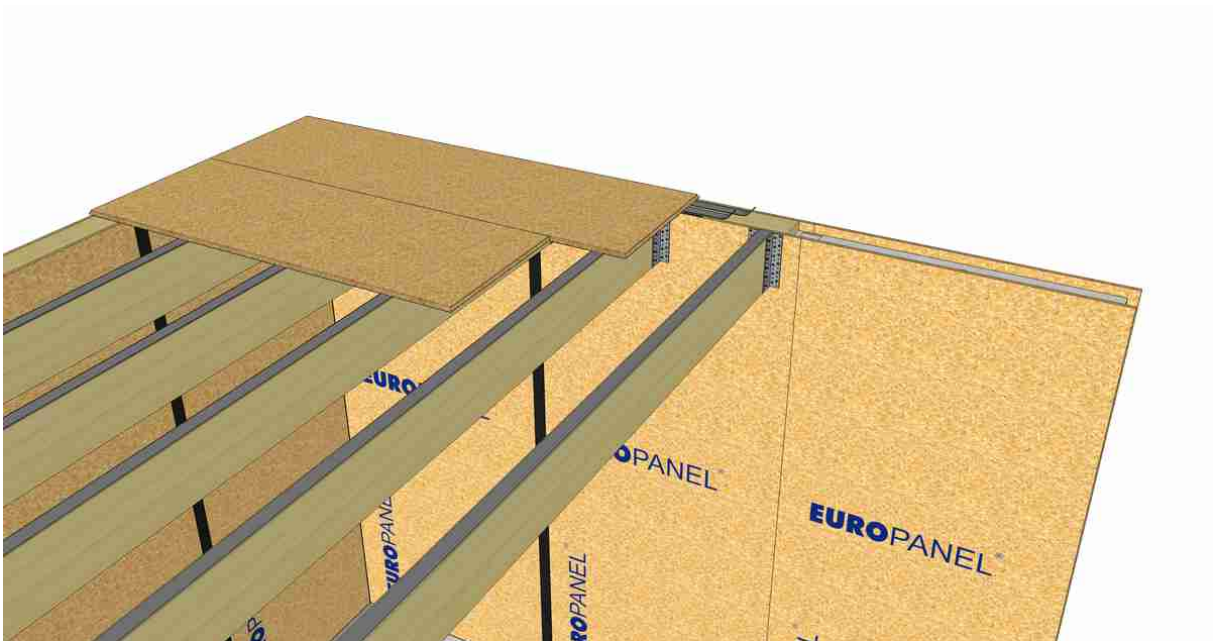
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Picture 9: Ceiling beams placed on the upper part of the panel

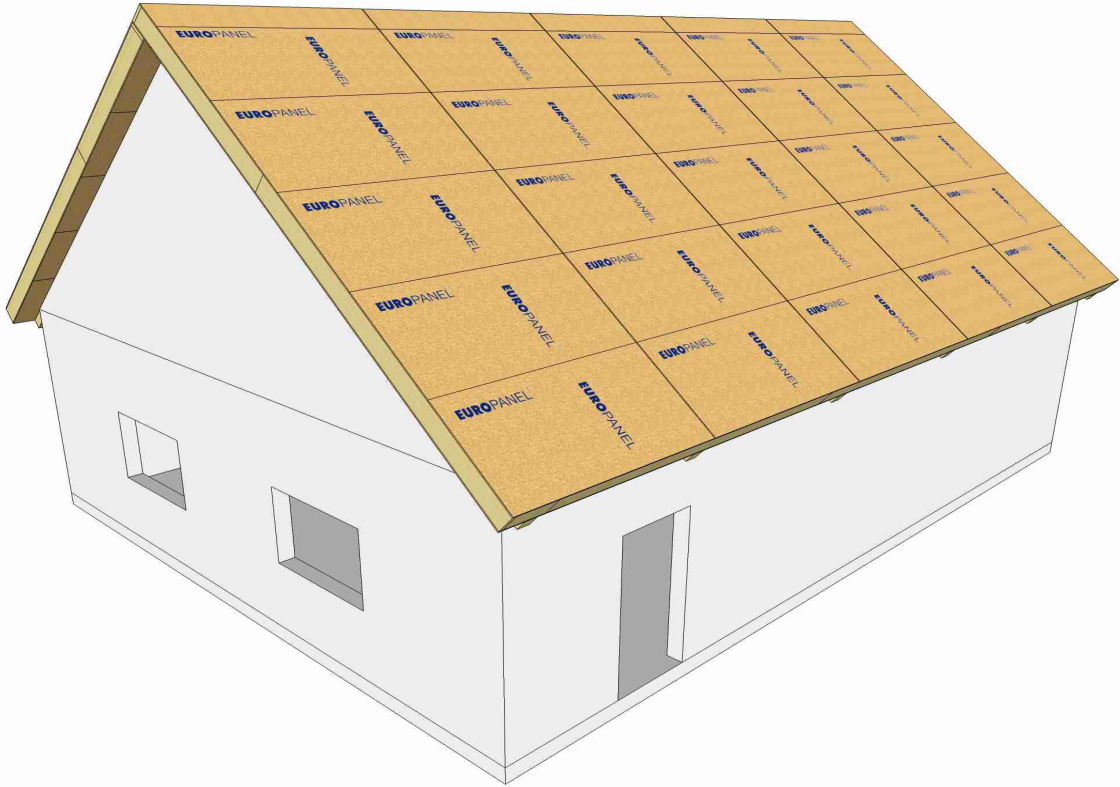


Picture 10: Ceiling structure with use of stirrup straps

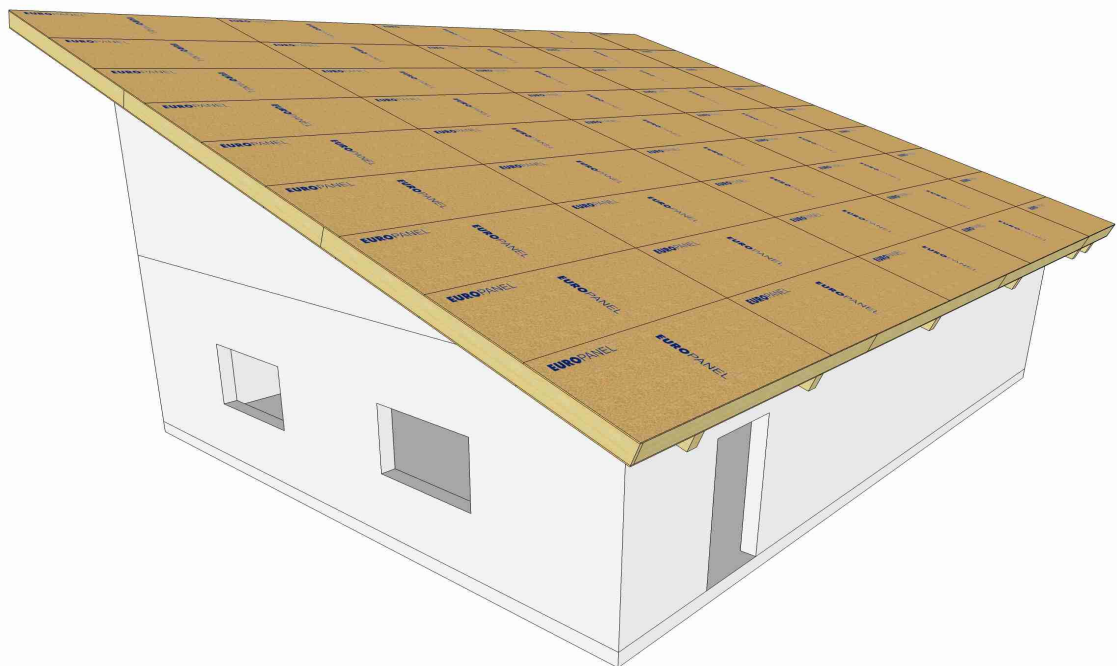
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Picture 11: Construction of saddle roof from EUROPANEL

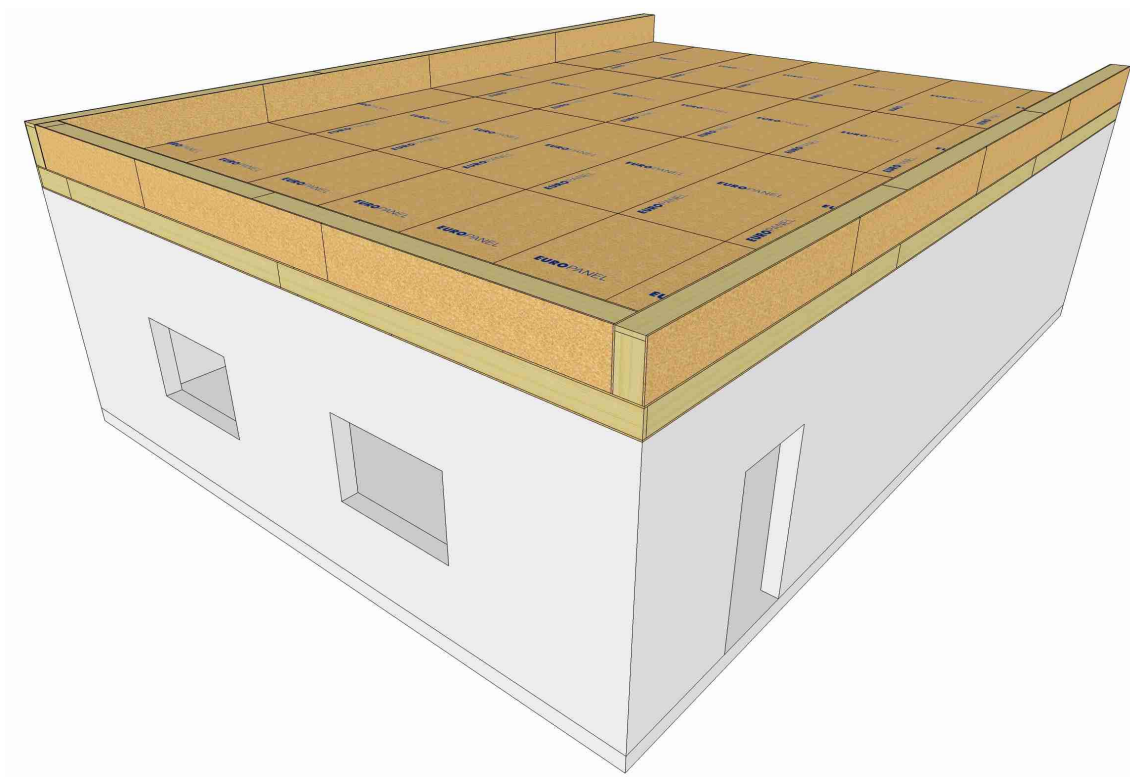


Picture 12: Construction of inclined roof from EUROPANEL

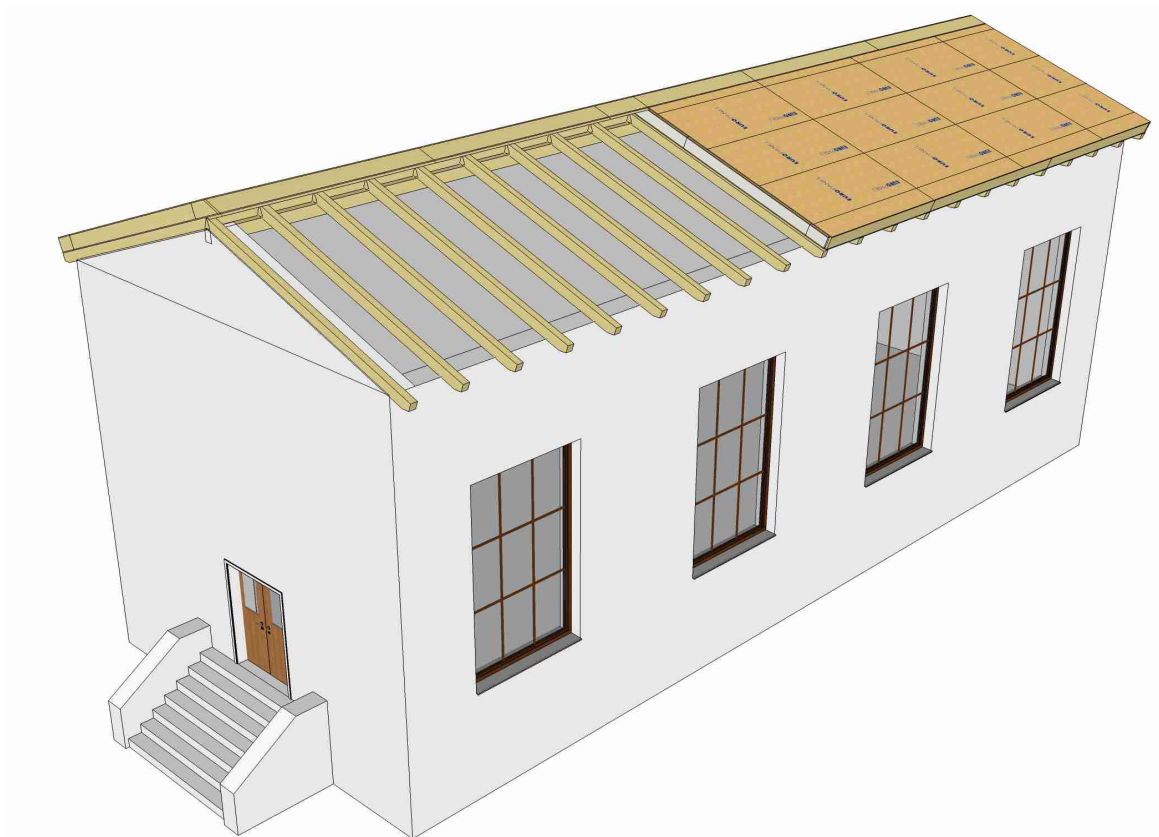
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Picture 13: Construction of flat roof from EUROPANEL



Picture 14: Reconstruction of the roof with remaining original roof frame

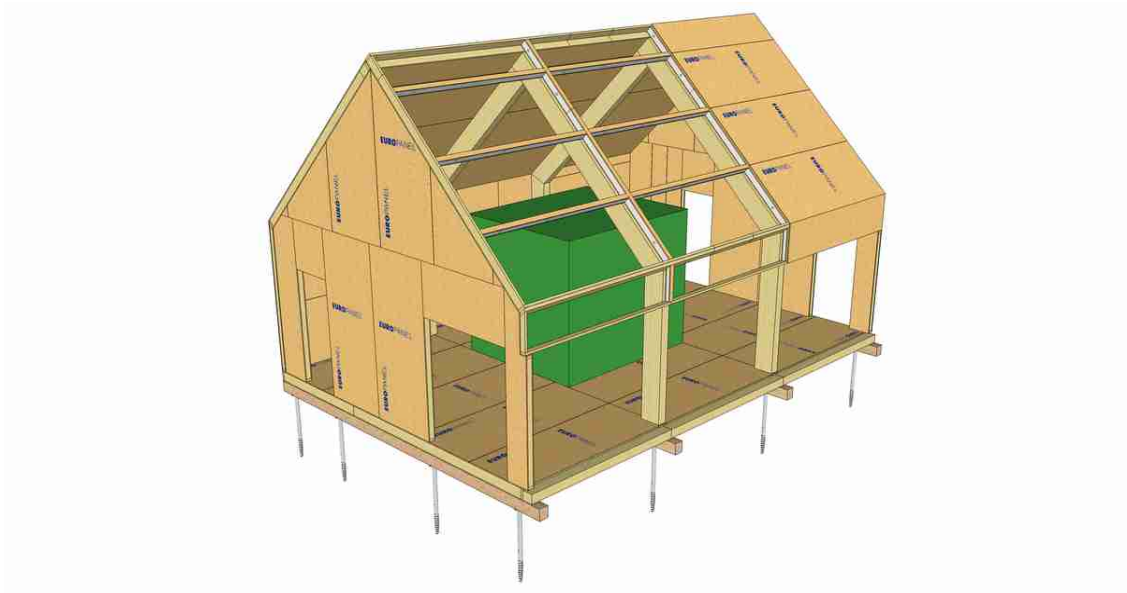
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7 Examples of buildings from EUROPANEL system

7.1 Family houses



Picture 1: The naturaSPACE 9 family house on ground screws



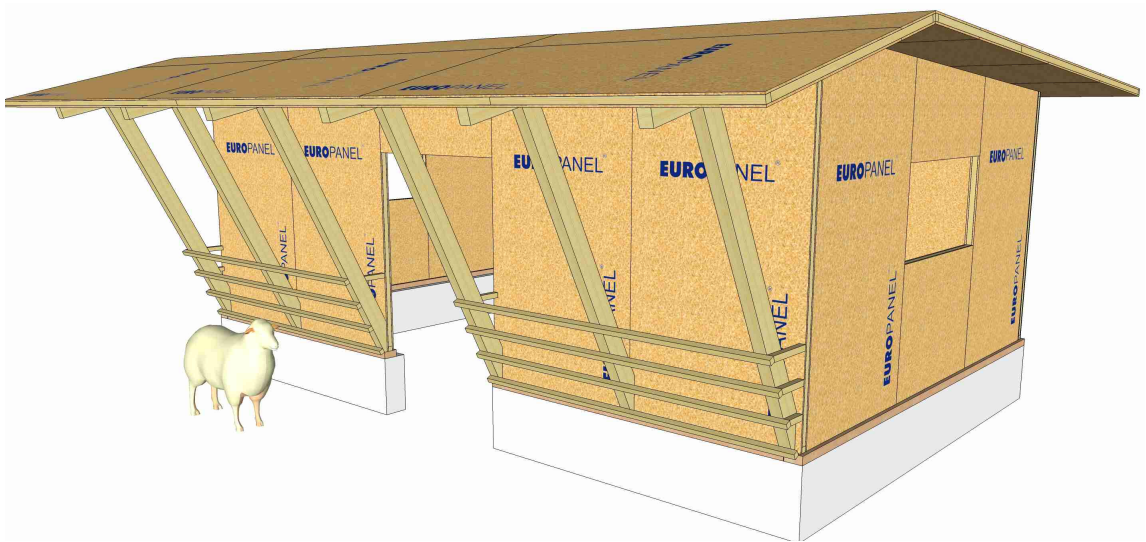
Picture 2: Family house on a concrete foundation plate

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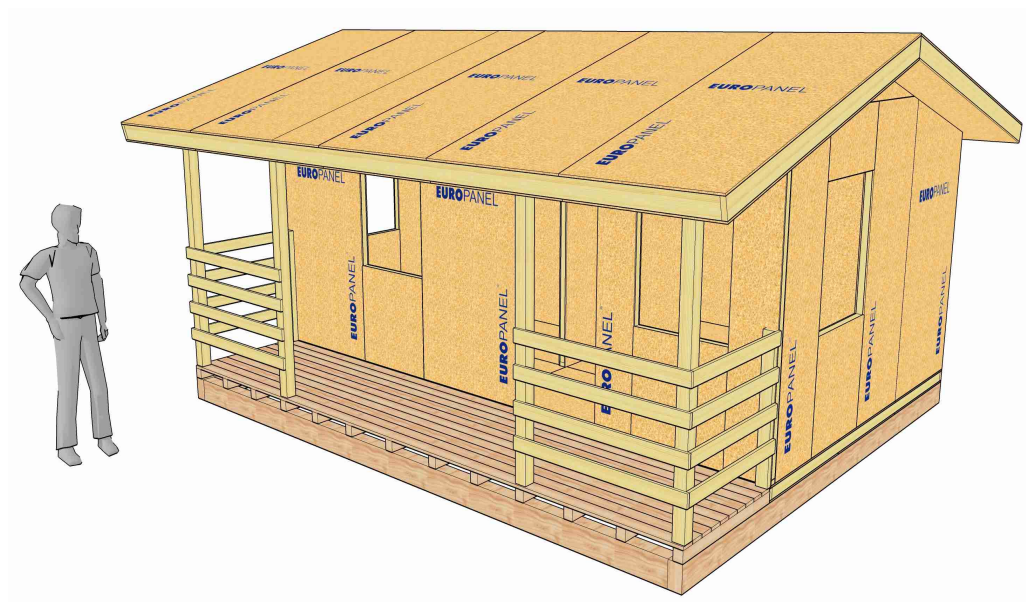
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7.2 Agricultural and recreational buildings



Picture 3: Agricultural structure - sheepfold



Picture 4: Recreational lodge VEGA

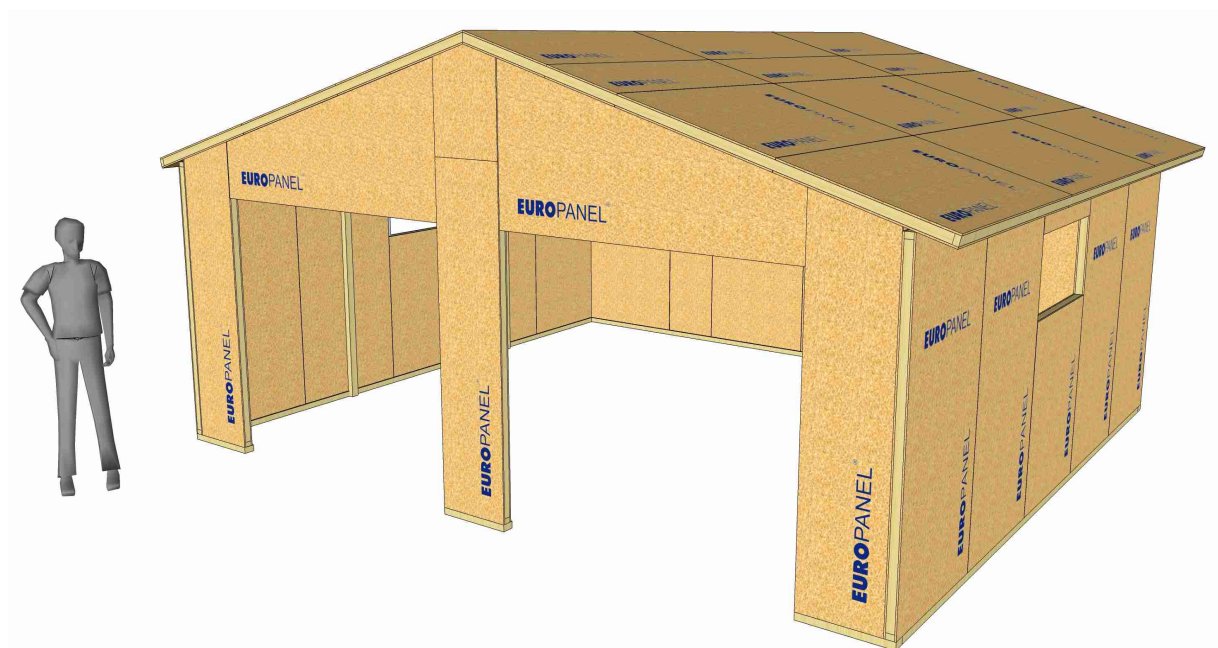
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Picture 5: Garage with flat roof



Picture 6: Double garage with saddle roof

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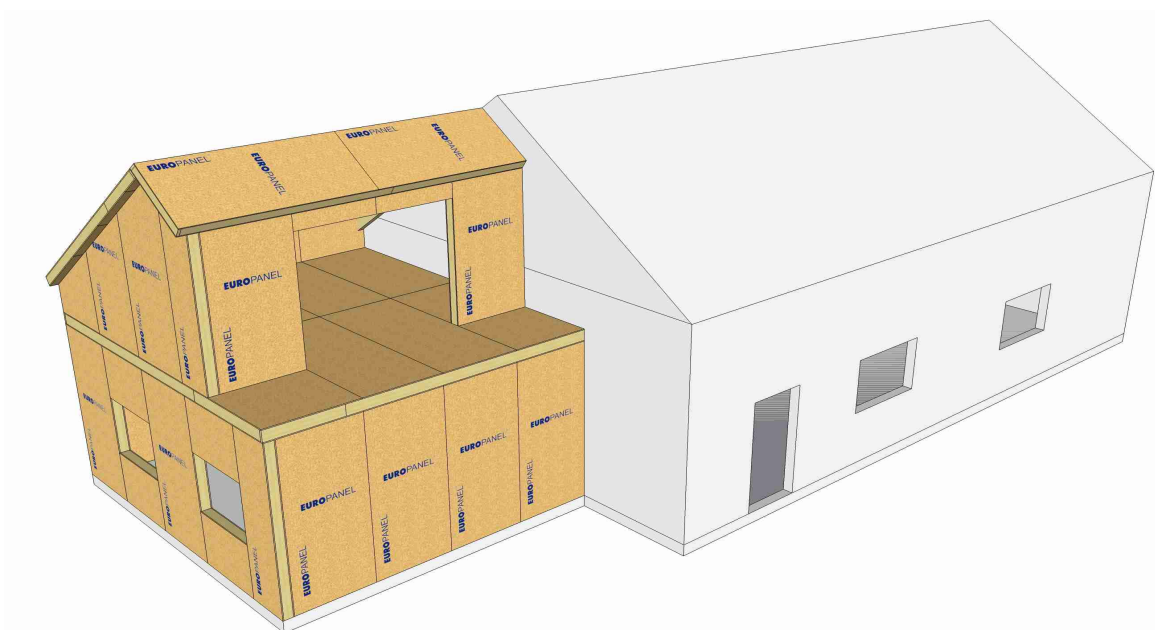
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7.3 Extensions from EUROPANEL



Picture 7: Roof extension on residential building

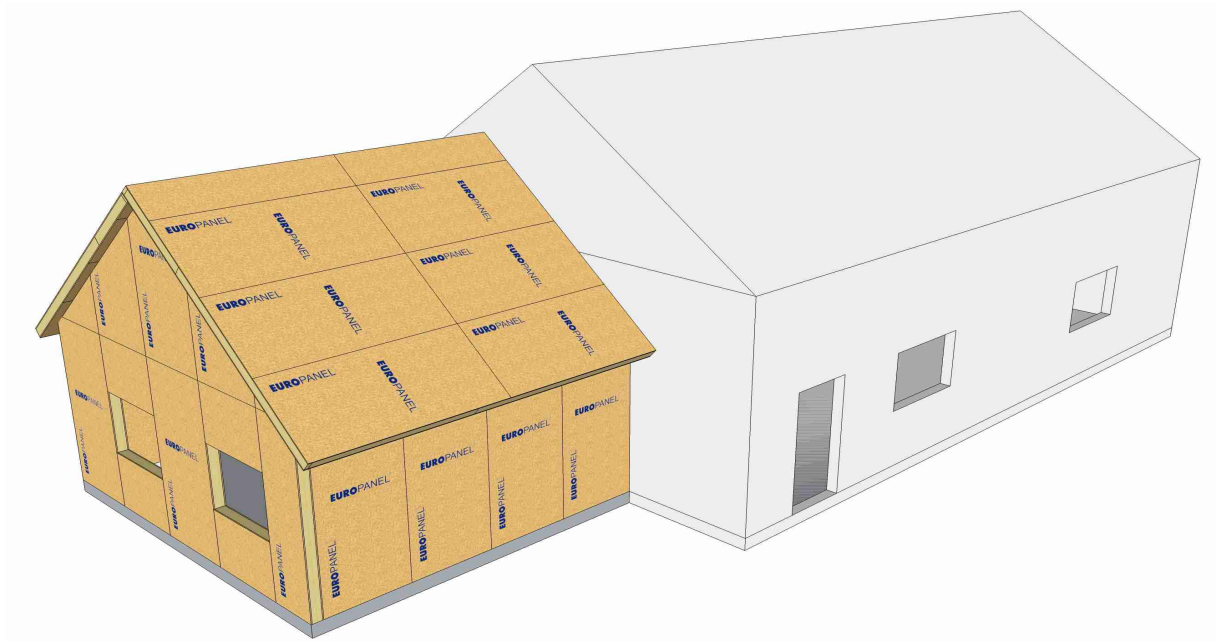


Picture 8: extension of family house from EUROPANEL with terrace

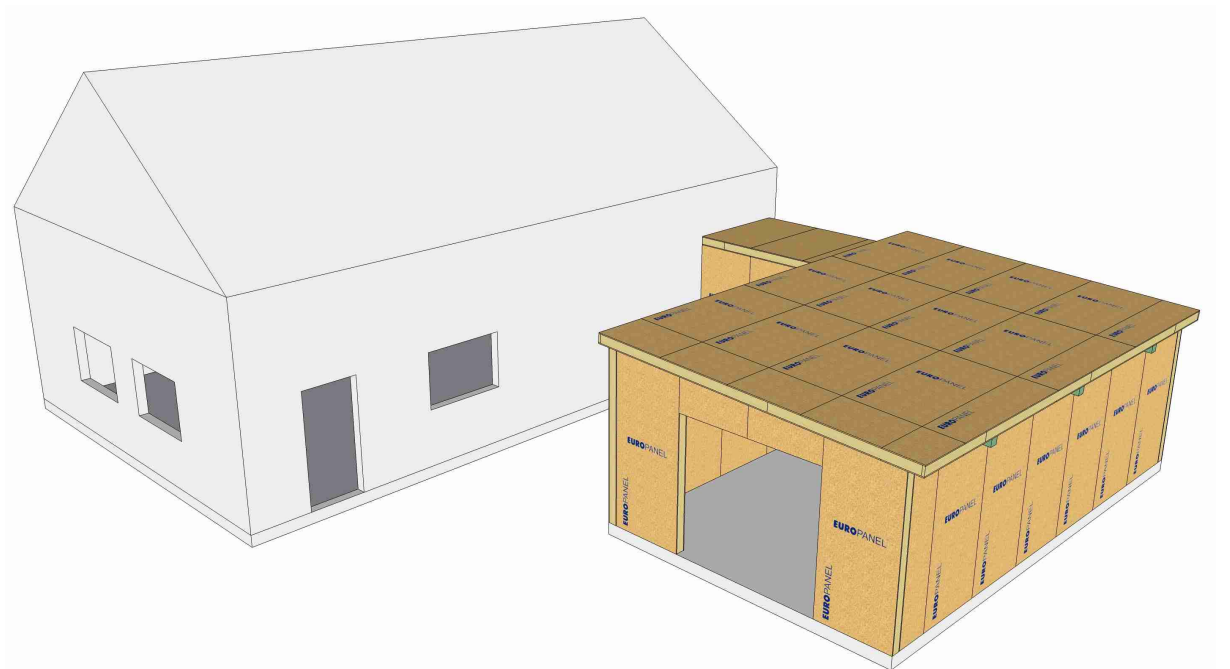
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Picture 9: extension of family house from EUROPANEL with saddle roof

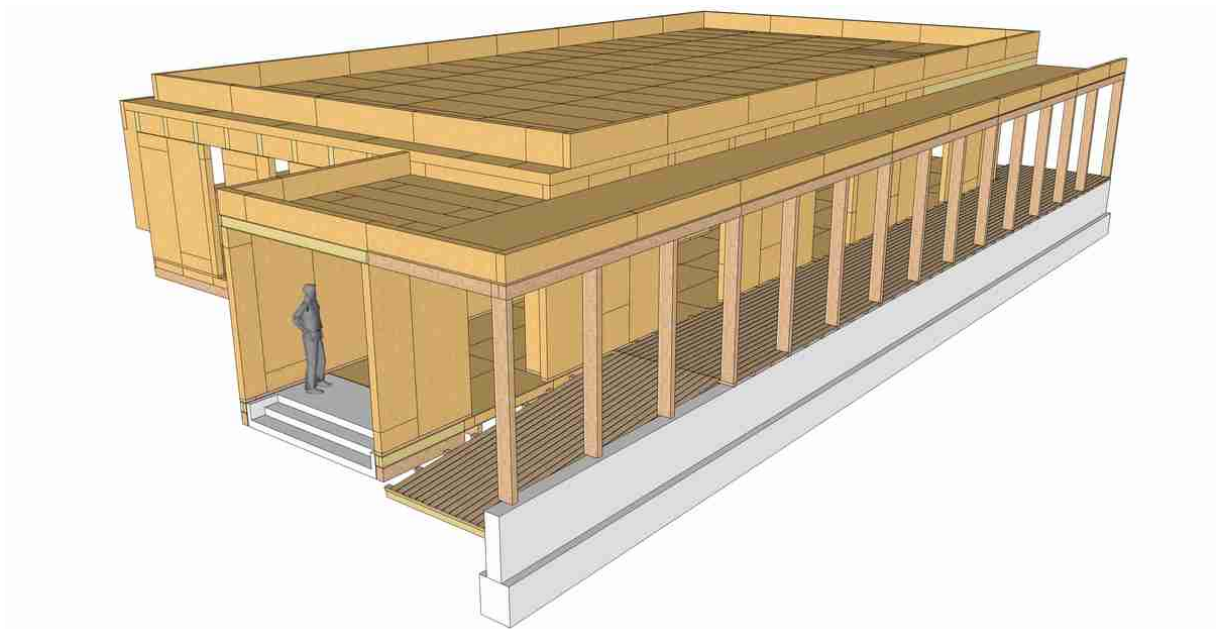


Picture 10: atelier extension of family house from EUROPANEL

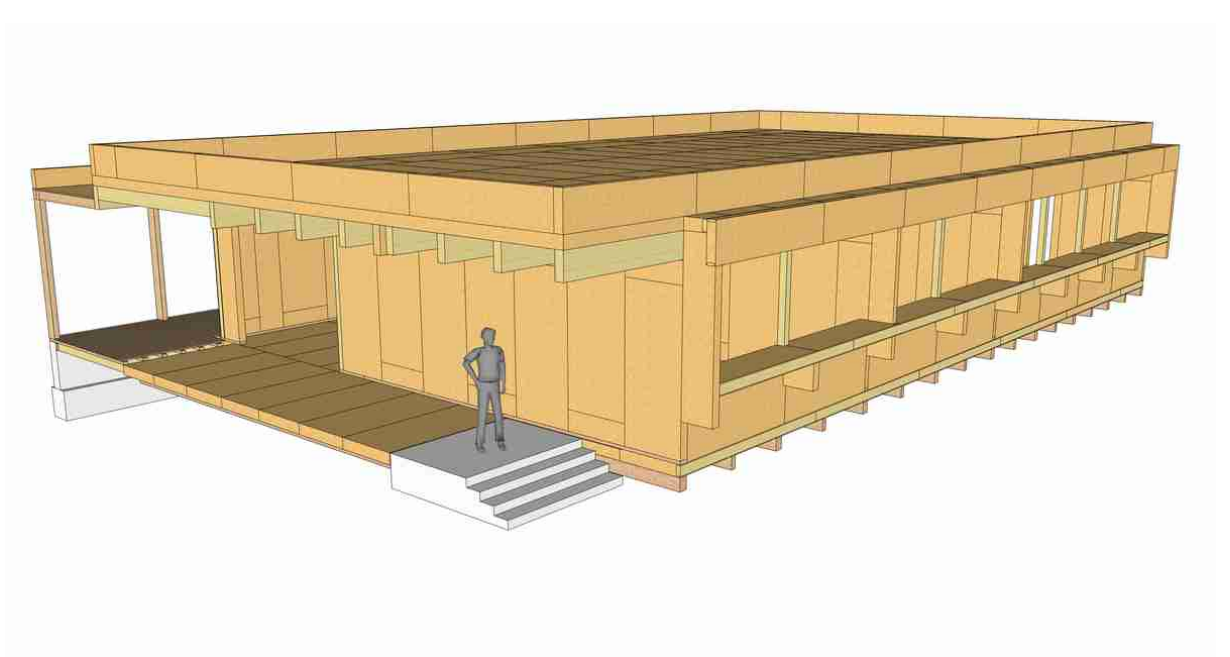
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Picture 11: Extension of the school Da Vinci – biggest building on ground screws in Czech Republic (2013)



Picture 12: Extension of the school Da Vinci – biggest building on ground screws in Czech Republic (2013)

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EUROPANEL TOWER – exhibit on Prague expo Dřevostavby