

**NORGES HUS**

PREFABRICATED HOMES



Healthier living in a welcoming home

www.norgeshus.ee

Introduction

QUALITY from the north.

Norges Hus Nova OÜ is an Estonian company that specialises in producing and assembling prefabricated homes with timber structures. All our homes are built in accordance with European standards. We build in Norway, Italy, Germany, Switzerland, Austria, Luxemburg, and Hungary.

All our houses can be adapted to meet your requirements – sometimes considerably so. Our designers will support you all the way from the initial concept to execution

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With Norges Hus Nova OÜ you can build the house you always dreamed of.

Our houses are modern and functional. Our projects also include commercial and public buildings, such as shops, offices and clinics.

We continually strive to create functional homes that are modern, environmentally friendly, and above all competitively priced.



Why choose us?

We believe it is possible to build strong, high-quality houses that meet the needs of our customers and quality standards at affordable prices.

Every house is designed with care, skill, experience and impeccable quality.

The external walls and roof are designed to guarantee that thermal loss is kept to a minimum. This keeps the house warm and welcoming come wind, rain or snow. All the materials used to build our houses come from internationally certified manufacturers. We only use high quality natural timber.

The timber structure of our homes has been designed to withstand all climatic conditions, in accordance with construction building practices. We only use high quality solid timber.

We create healthy, efficient and environmentally friendly homes with our winning combination of quality materials and expertise. With more than ten years of experience in building prefabricated houses, Norges Hus has all the skills required to deliver superior quality products and satisfy its clients.

REASONS FOR CHOOSING A PREFABRICATED TIMBER HOME:

- They have better earthquake resistance than traditional houses because timber withstands stress and is flexible
- They offer a high level of energy savings
- With a good price to quality ratio, they offer greater value for money
- The construction period is significantly shorter
- They are fire resistant. In the event of fire only the first layer burns. This means there is no risk of structural collapse
- They have larger useable floor space
- They do not require any more maintenance than traditional homes
- There is less waste, and the construction site is cleaner

HOW DO WE BUILD AND ASSEMBLE?



We are equipped with the very best precision machinery supplied by leading European manufacturers. However, we still place a great deal of importance on doing things by hand. This means that you can expect the utmost attention to detail and quality of the highest level.

All materials are strictly CE marked and sourced from the best European production firms.
All components of the house are loaded onto 40 t lorries inside the production facility to protect them from rain or snow.



ASSEMBLY

On site assembly of the timber structure is performed using a 30 t crane.



TEAM

A four person team can assemble a house in 7-14 days.



CLIENTS

Clients obtain a high-quality dry timber structure, which, during the initial stages, can be modified internally.

General Features

DELIVERY

The delivery and assembly of the house components is understood to be PRE-FINISHED.

WINDOWS

All windows and French window doors are triple glazed with a double void and Class S mouldings. In addition, they have a particularly high level of thermal radiation resistance (12GJ/m²).

EXPOSED BEAM CEILINGS

The exposed beam ceiling supplied has a heat transfer coefficient equal to: $U = 0.18 \text{ W/m}^2$.

WALLS

The load-bearing external wall structure is framed and finished with a wood fibre coating with a thermal insulation coefficient of: $U = 0.120 \text{ W/m}^2$.

WARRANTY

The structures are guaranteed for ten years.



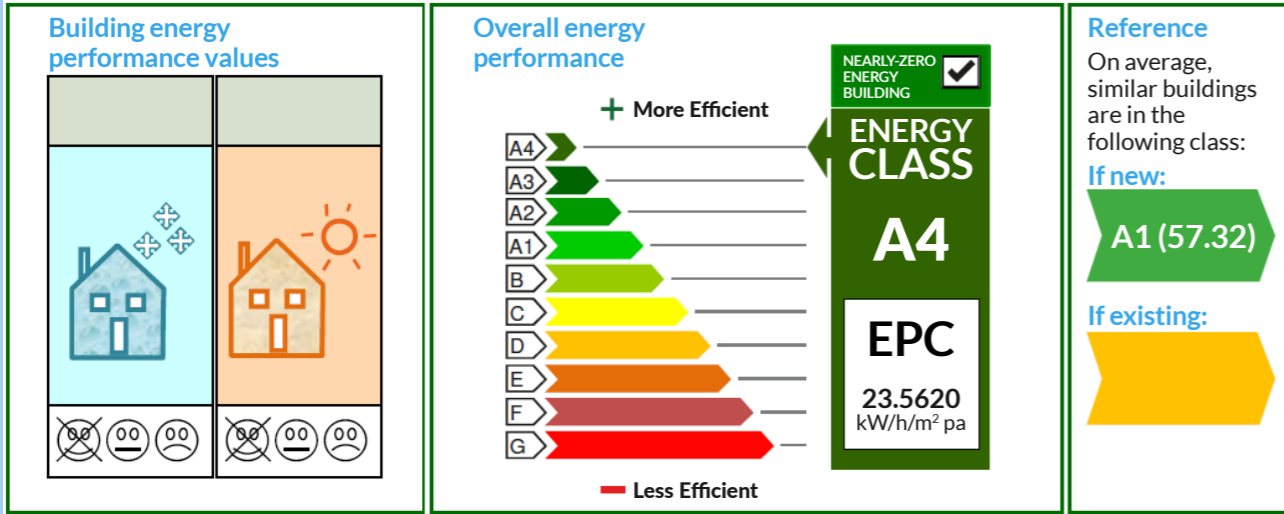
Main Features

ENERGY RATING

A virtually passive building with an energy rating of A+ or higher.

OVERALL AND BUILDING ENERGY PERFORMANCE

The cross section shows the overall non-renewable energy performance of the building and of the energy sources available, in addition to the building's energy performance, net of the production of the equipment in situ.



THERMAL INSULATION

Sheet: MR1

THERMAL AND HYGROMETRIC PROPERTIES OF THE OPAQUE COMPONENTS

Structure Code: MEU=0.133
Description of Structure: EXTERNAL PERIMETER CAVITY WALL MADE FROM A PLASTERBOARD PANEL, OSB/3, MINERAL WOOL, PE FILM, VAPOUR BARRIER, AIR CAVITY, RENDERED EXTERNAL CLADDING

N°	LAYER DESCRIPTION (outwards from the inside)	s [mm]	lambda [W/mK]	C [W/m ² K]	M.S. [kg/m ²]	P<50x10 ¹² [kg/msPa]	C.S. [J/kgK]	R [m ² k/W]
1	Internal facings	0		7.700			0	0.130
2	Plasterboard sheet	12	0.210	17.500	10.80	23.000	1000	0.057
3	STEICO wood fibre panels - ms. 160	12	0.038	3.167	1.92	38.600	2100	0.316
4	Wood wool panels with non-organic binders - mv 500	50	0.109	2.184	25.00	50.000	1500	0.458
5	Synthetic material film	2	0.230	115.000	2.20	0.010	900	0.009
6	Wood wool panels with non-organic binders - mv 500	220	0.109	0.496	110.00	50.000	1500	2.015
7	3 cm vertical air layer	30	0.167	5.553	0.04	193.000	1008	0.180
8	STEICO wood fibre panels - ms. 160	30	0.038	1.267	4.80	38.600	2100	0.789
9	External render Specific Heat 1000 J/kgK	10	0.900	90.000	18.00	8.500	1000	0.011
10	External facings	0		25.000			0	0.040

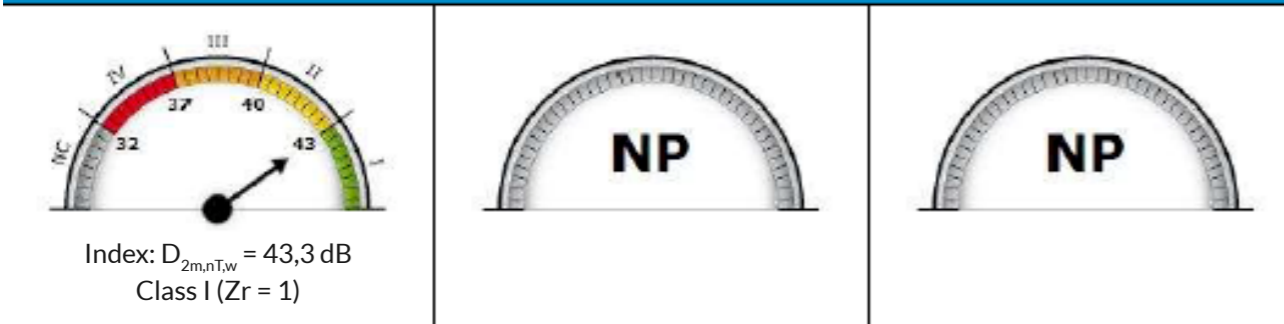
RESISTANCE = 4.005 m ² K/W	TRANSMITTANCE = 0.250 W/m ² K
THICKNESS = 366 MM	THERMAL AIR CAPACITY (int) = 22.674 kJ/m ² K
PERIODIC THERMAL TRANSMITTANCE = 0.01 W/m ² K	SURFACE MASS = 155 kg/m ²
FRSI TEMPERATURE FACTOR = 0.7942	ATTENUATION FACTOR = 0.04
	OFFSET = 18.78 h

S = Layer thickness; lambda = Material thermal conductivity; C = conduction per unit; M.S. = Surface mass; P<50*10¹² = Vapour permeability with relative humidity up to 50%; C.S. = Specific Heat; R = Thermal resistance of individual layers; Resistance - Transmittance = Actual resistance and transmittance values; Surface Mass = Value calculated as set out in Appendix A of Law Decree 192/05 as amended.

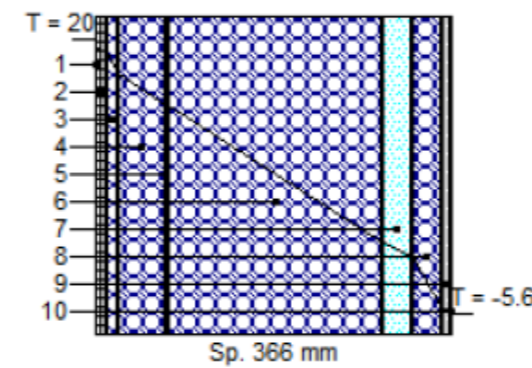
ACOUSTIC RATING

Class 1

ACOUSTIC CLASS FORECAST FOR THE PROPERTY UNIT: I



STRUCTURAL LAYERING



PRESSURE DIAGRAMS



	Ti [°C]	Psi [Pa]	Pri [Pa]	Uri [%]	Te [°C]	Pse [Pa]	Pre [Pa]	Ure [%]
PRESSURE DIAGRAMS	20.0	2 337	1 168	50.0	-5.6	380	148	38.9

Ti = Internal Temperature; Psi = Internal saturation temperature; Pri = Relative internal temperature; Uri = Relative internal humidity; Te = External temperature; Pse = External saturation temperature; Pre = Relative external temperature; Ure = Relative external humidity

External Wall Supply

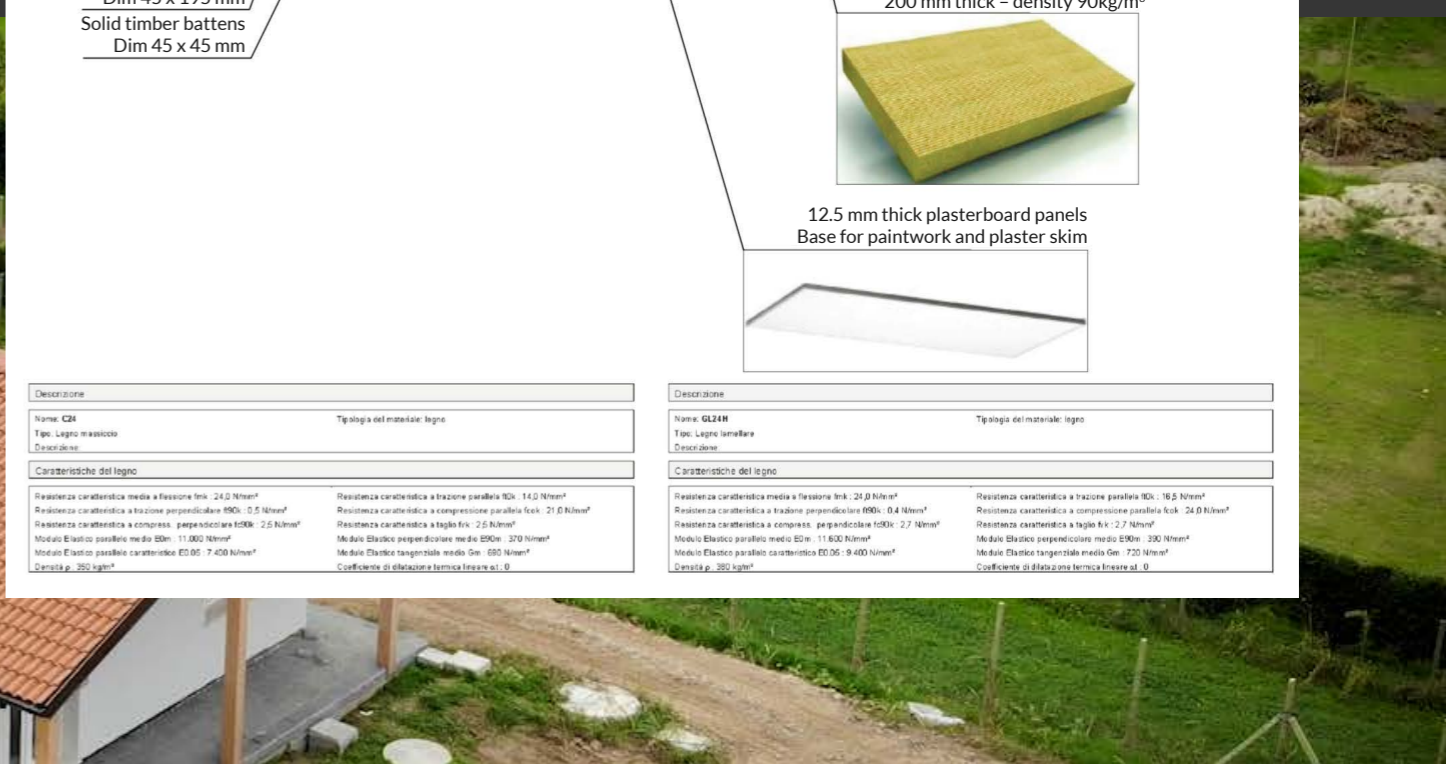
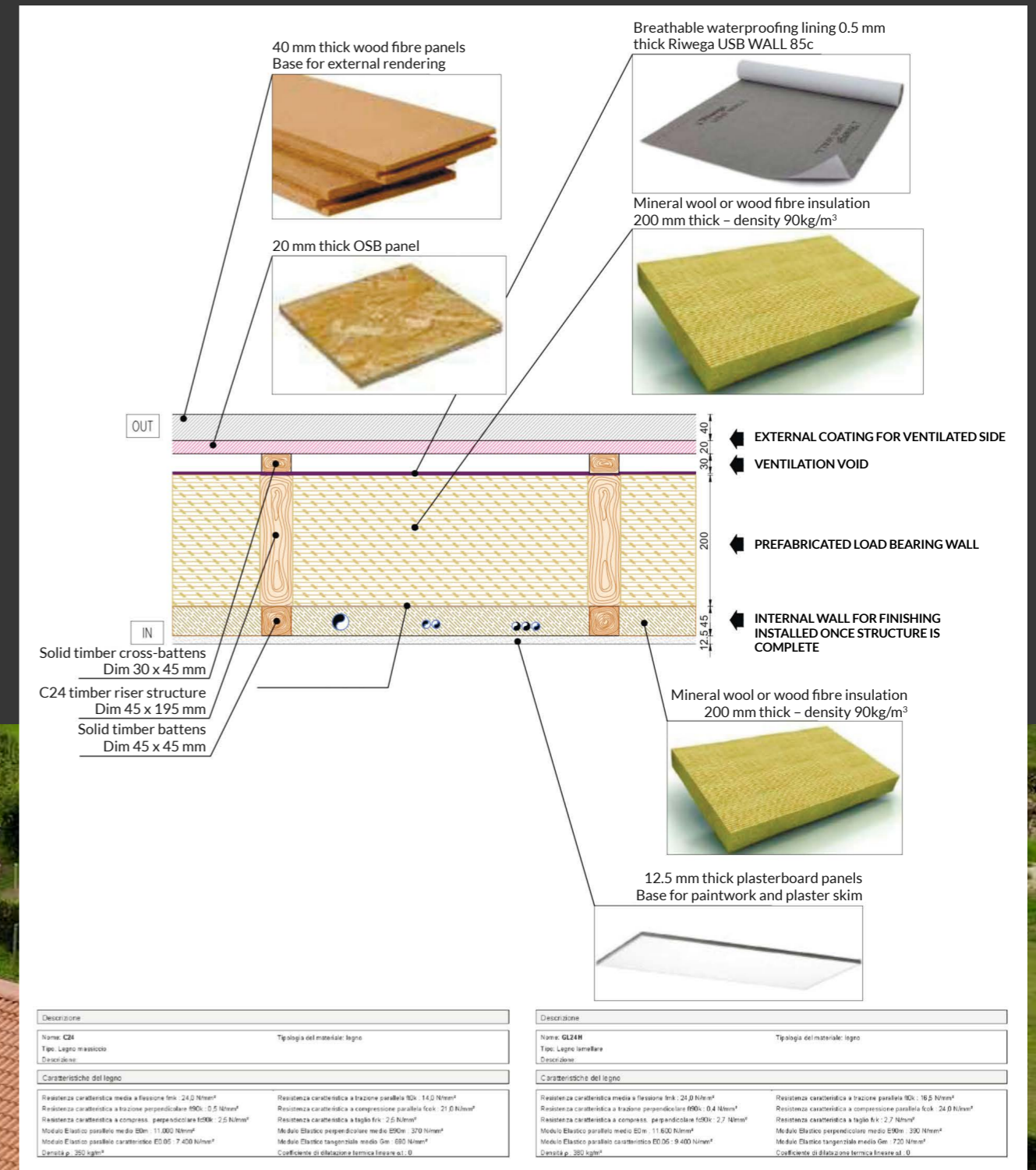
OUR EXTERNAL WALL SUPPLY AND ASSEMBLY SERVICE INCLUDES:

- Insulated external walls: wall height 2500mm – possible wall height up to 3000mm
- Wooden cladding UYVK 21x145 Spruce AB – horizontal
- 30x45mm ventilation lath
- Wind barrier TYVEK
- Timber construction C24 / 45x195mm with 600mm interval
- 200mm insulation (200mm rock wool ROCKWOOL / SUPERROCK)
- Vapor barrier 0,2mm
- BITUMEN – ICOPAL 300mm – hydro insulation



Building details for external perimeter walls

EXTERNAL LOAD-BEARING WALLS WITH RENDER FINISHES



Internal Wall Supply



OUR INTERNAL WALL SUPPLY AND ASSEMBLY SERVICE INCLUDES:

Wall frames with 45 mm thick C24 timber uprights of varying widths (45x95/120/145mm).

Supplying and assembling lofts

(FOR TWO STOREY HOMES ONLY)

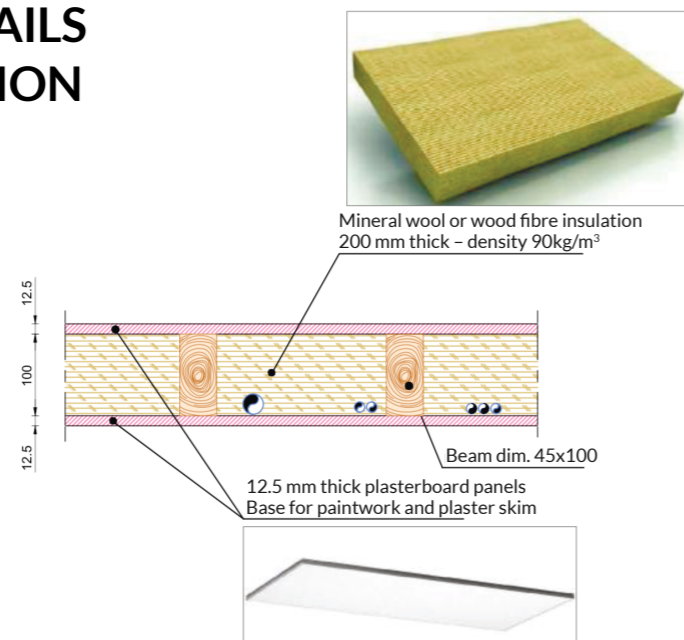
OUR LOFT SUPPLY AND ASSEMBLY SERVICE (FOR TWO STOREY HOMES ONLY) INCLUDES:

Ceiling construction is made of 240 mm thick timber beams at intervals that vary depending on the structural calculations.



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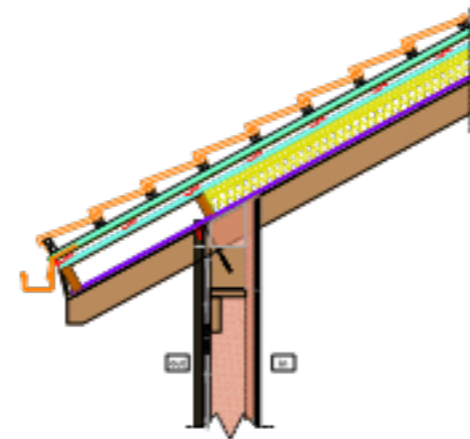
CONSTRUCTION DETAILS OF INTERNAL PARTITION WALLS



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Descrizione		Descrizione	
Nome: C24	Tipologia del materiale: legno	Nome: GL24H	Tipologia del materiale: legno
Tipo: Legno massiccio		Tipo: Legno lamellare	
Classificazione:		Classificazione:	
Caratteristiche del legno		Caratteristiche del legno	
Resistenza caratteristica media a flessione $f_{m,k}$: 24,0 N/mm ²	Resistenza caratteristica a trazione parallela $f_{t,0,k}$: 14,0 N/mm ²	Resistenza caratteristica media a flessione $f_{m,k}$: 24,0 N/mm ²	Resistenza caratteristica a trazione parallela $f_{t,0,k}$: 14,5 N/mm ²
Resistenza caratteristica a trazione perpendicolare $f_{t,90,k}$: 0,5 N/mm ²	Resistenza caratteristica a compressione parallela $f_{c,0,k}$: 21,0 N/mm ²	Resistenza caratteristica a trazione perpendicolare $f_{t,90,k}$: 0,4 N/mm ²	Resistenza caratteristica a compressione parallela $f_{c,0,k}$: 24,0 N/mm ²
Resistenza caratteristica a compress. perpendicolare $f_{c,90,k}$: 2,5 N/mm ²	Resistenza caratteristica a taglio $f_{v,k}$: 2,5 N/mm ²	Resistenza caratteristica a compress. perpendicolare $f_{c,90,k}$: 2,7 N/mm ²	Resistenza caratteristica a taglio $f_{v,k}$: 2,7 N/mm ²
Modulo elastico parallelo medio $E_{0,05}$: 11.000 N/mm ²	Modulo elastico perpendicolare medio $E_{0,05}$: 370 N/mm ²	Modulo elastico parallelo medio $E_{0,05}$: 11.600 N/mm ²	Modulo elastico perpendicolare medio $E_{0,05}$: 390 N/mm ²
Modulo elastico parallelo caratteristico $E_{0,05}$: 7.400 N/mm ²	Modulo elastico tangenziale medio $G_{0,05}$: 690 N/mm ²	Modulo elastico parallelo caratteristico $E_{0,05}$: 9.400 N/mm ²	Modulo elastico tangenziale medio $G_{0,05}$: 720 N/mm ²
Densità ρ_0 : 380 kg/m ³	Coefficiente di dilatazione termica lineare $\alpha_{t,0}$: 0	Densità ρ_0 : 380 kg/m ³	Coefficiente di dilatazione termica lineare $\alpha_{t,0}$: 0

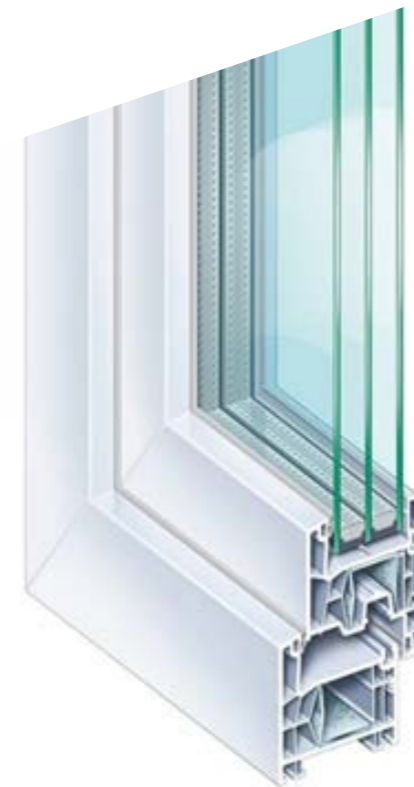
EXPOSED BEAM CEILING



- Structural beams measuring 120 mm x 180 mm, in accordance with the structural calculations
- Tongue-and-groove wooden flooring dimensions: 20 mm x 115 mm or plasterboard at the client's request:
- Riwega DO 135 0.5 mm thick waterproof breathable membrane
- 150 mm thick mineral wool thermal insulation
- 44 mm x 140 mm planks
- 12 mm thick OSB panels
- Riwega DO 135 0.5mm thick waterproof breathable membrane
- 25 mm x 50 mm battens, fixed lengthways to the underside of the joists, with Riwega USB Tip KONT continuous seal.



WINDOWS



- White PVC or a colour selected from our catalogue
- Triple glazing with double void
- S Class mouldings
- Thermal radiation resistance coefficient equal to 12 GJ/m²
- Heat transfer coefficients
 - U_w value = up to 0.50 W/(m²K)
 - U_f value = 0.95 W/(m²K)



Transport and Assembly



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THE FOLLOWING ARE ADDITIONAL CHARGES AND NOT INCLUDED IN THE QUOTATION:

Raft foundations; Cranes; Scaffolding and portable ladders, if required.

THE FOLLOWING ARE NOT INCLUDED IN THE PRICE:

Sheet metalwork around the chimneystacks and roofing; Electrical work; Plumbing work; Mouldings. Secure site access for 2-3 or more lorries, depending on the size of the house.



WE DO NOT SUPPLY THE FOLLOWING SO THEY SHOULD BE ARRANGED BY THE CLIENT:

- Cranes
- Raft foundations
- Scaffolding and portable ladders
- Window and perimeter wall infills prior to rendering
- If access to the building site with an articulated lorry is impossible, then transport from the closest loading location within reachable distance of the site should be arranged by the client
- Board and lodging for the assembly team for the entire duration of assembly
- Site waste removal
- Anything that is not specifically mentioned in the sections stated in this proposal

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Portal Frame Roof Supply

OUR CURRENT SUPPLY SERVICE PORTAL FRAME FOR ROOF CONSTRUCTION INCLUDES:

- 30x45mm roof ventilation lath
- Roofing foil SILVER
- Load-bearing portal frame with beams in accordance with the structural calculations
- Roof sides overlap 600mm
(doesn't include canopies, awnings, posts, columns and other protruding parts)

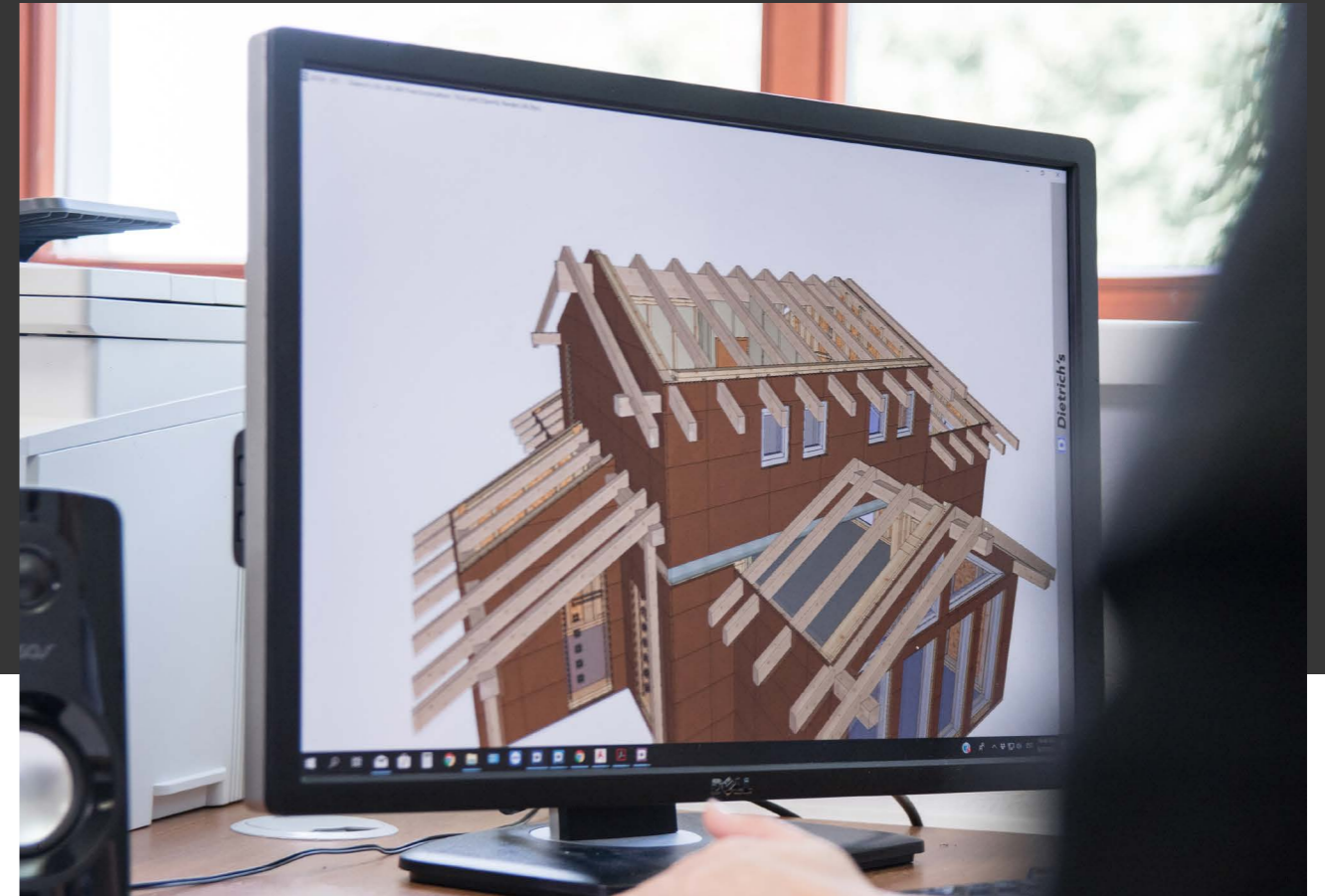


NORGES HUS TEAM EUROPE

Quality and Technology



Production



Projects in progress



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