ISOHEMP
NATURAL BUILDING

HEMP BLOCKS

APPLICATION GUIDE

For sustainable construction and renovation.

EDITORIAL

> Selection of construction materials is of primary importance.

Building performance, ease of implementation, impact on the health of occupants are also criteria that will guide your choice.

You have a building or renovation project and of course you want a solution without compromises? Profit from the many advantages of walls made of IsoHemp hemp blocks: healthy and warm atmosphere, optimum thermal and sound insulation, moisture regulation, fire resistance, etc.

We have designed this guide to present you with an as specific as possible presentation of the benefits, applications, performance and complementarity of hemp blocks in different building systems.

As an added bonus, you can of course count on our team of experts to guide you in your considerations. They will help you to find the answers you need and provide you with the technical support necessary in carrying out your projects.

Join us in constructing tomorrow's sustainable buildings!

OUR VALUES

› EXPERTISE

All of our experience is at your service to provide you with the most appropriate solution for your construction or renovation project.

› RELIABILITY

Certified quality material that ensures a long building life.

› ECOLOGY

Respect for the environment due to both the type of products offered and their manufacturing process.

› PROXIMITY

A team available to help you in the optimum completion of your projects.

› HEALTHY HABITAT

Natural materials respect your health by providing a healthy interior climate.

CONTENTS

THE HEMP BLOCK

The hemp block, naturally effective in all its applications

The IsoHemp hemp block is a non-load-bearing glued masonry product intended for all types of projects both in new builds and renovation. It can be used for:

- Construction of envelopes
- Construction of partitions
- Implementation of interior and exterior lining
- Insulation of flat roofs and floors

Its insulating performance complies with low energy, very low energy and passive house standards

› BUILD

OUR SOLUTIONS :

1. Hempro system
2. Timber columns-beams
3. Metal structure
4. Timber framework
5. Load-bearing masonry
6. CLT timber structure

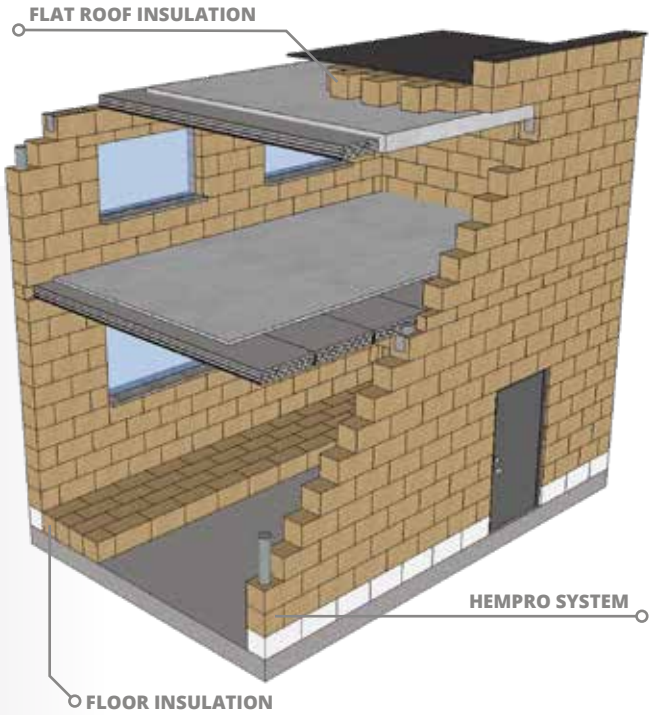
› RÉNOVER

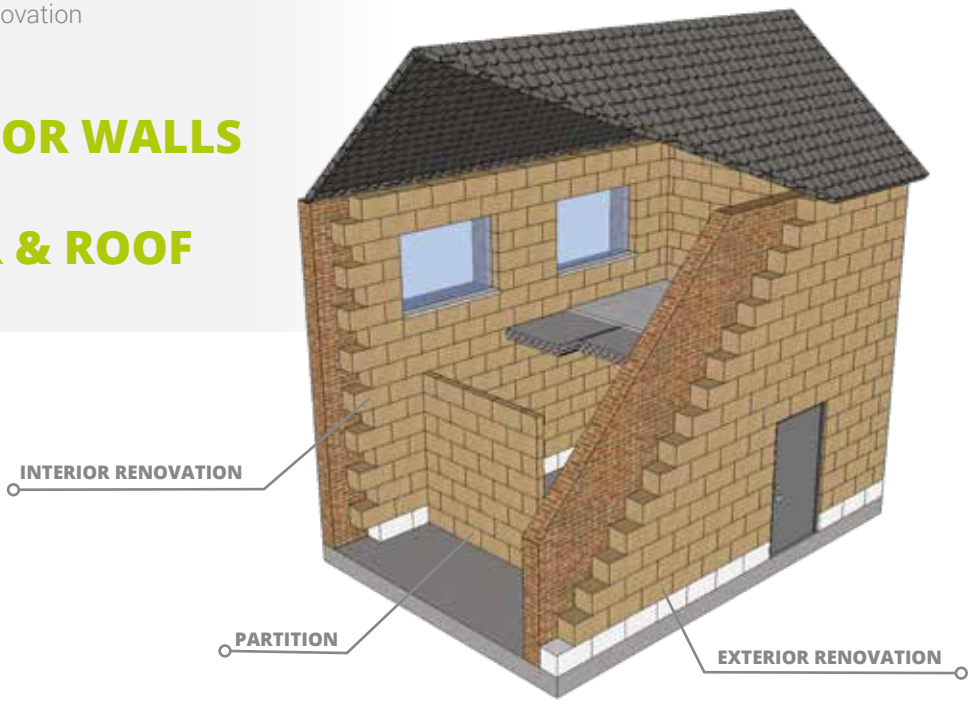
OUR SOLUTIONS :

1. Interior renovation
2. Exterior renovation
3. Extension

› INTERIOR WALLS

› FLOOR & ROOF





The 5 major advantages of the hemp block

›THERMAL REGULATION

The hemp block naturally regulates the temperature of the building thanks to its excellent ability to store and dissipate accumulated heat. This insulating block has a high thermal inertia and protects:

- Against the cold in winter by keeping the heat in the house for longer
- Against the heat in summer by avoiding overheating of the living areas.

As a true thermal buffer, it maintains a constant interior temperature and significantly reduces the effect of heat variations between day and night.

›SOUND INSULATION

Whether you use the IsoHemp hemp blocks for your walls or internal partitions, both ambient and outside noises are significantly reduced. Thanks to its performance in respect of both sound attenuation and absorption, the hemp block acts as a genuine sound trap - damping the majority of sound waves and thus protecting you against noise pollution.

›MOISTURE REGULATION

Thanks to its high permeability to water vapour, the hemp block acts as a moisture buffer, thus providing a constant interior climate that is healthy for the building inhabitants. It also prevents condensation problems by naturally managing the exchanges of moisture between walls or different materials.

Its uses:

- Renovation and isolation of old buildings with old brick walls or damp walls
- Interior renovation to insulate walls which also serve to support the wooden floors that project into them. It prevents any condensation problems at the interface of different
- materials and in this way ensures excellent preservation of the existing building
- Humidity regulation in commercial projects where the variations in humidity level are significant: archive rooms, museums, gyms, swimming pools, etc.

›FIRE PROTECTION AND FIRE RESISTANCE

The IsoHemp hemp block complies with the standards in force and provides a simple and effective solution to fire protection problems for new builds, being just as applicable to industrial and communal (nurseries, schools, etc.) buildings as it is to residential buildings. Having an excellent reaction to fire (Class A2 for a block rendered on both sides), it also offers more than two hours of fire resistance dependent on the finish and the thickness of the block used. It is inflammable and does not release toxic gases during its combustion.

›HEALTH & ENVIRONMENTAL QUALITIES

The hemp block fulfils the most exacting requirements where sustainable development is concerned: it is manufactured using a very low energy process using 100 % natural material (lime and hemp) sourced from local supply chains. Constructing or renovating your house with hemp blocks allows you to store permanently more than 2 tonnes of CO2 previously contained in the air.

Therefore, an extremely positive carbon balance!

THE HEMP BLOCK

Technical characteristics of the hemp block

Very versatile, the IsoHemp hemp block responds to many challenges both for new builds and renovations, whether in single-family or multi-family dwellings or commercial buildings.

RANGE OF BLOCKS

HOLED BLOCK

U-BLOCK

› SUMMARY TABLE

Technical characteristics		Block 6	Block 9	Block 12	Block 15	Block 20	Block 25	Block 30	Block 36	Unit
Thickness		6	9	12	15	20	25	30	36	cm
Modular dimensions		60x30								cm
Number of blocks per m²		5,5								blocks/m²
Maximum block weight		4,6	7,1	9,2	11,5	15,3	20	23	27,5	kg
Bulk density when dry		340								kg/m³
Adhesive consumption		2,4	3,6	4,7	5,8	7,8	9,7	11,6	14	kg/m²
Dry thermal resistance		0,90	1,34	1,79	2,24	3	3,73	4,48	5,37	m²K/W
Thermal resistance at 50% RH		0,85	1,27	1,69	2,11	2,82	3,52	4,23	5,07	m²K/W
Thermal conductivity λ		0,071								W/mK
Phase shift		3,9	5,9	7,9	9,8	13,1	16,4	19,7	23,6	h
Sound reduction index* Rw		37	38	39	40	42	43	44	45	dB
Acoustic absorption coefficient α		0,85								
Equivalent air layer thickness Sd		0,17	0,25	0,34	0,42	0,56	0,70	0,84	1,00	m
Water vapour resistance factor μ		2,8								
Compressive strength		300								kPa
Dimensional tolerance		+4 ; -2								mm
Reaction to fire	Without render	B, S1, d0								
	With render	A2								
Resistance to fire with render				60		120				min

Technical characteristics	O Blocks		U Blocks		Unit
Thickness	30	36	30	36	cm
Modular dimensions	60x30				cm
Maximum block weight	19,7	24,3	15,3	18,3	kg
Diameter of the recess	15	18	15 x 20	18 x 20	cm
Cross-section of the recess	177	254	300	360	cm²
Adhesive consumption	11	12	10	12	kg/m²

* Masonry hemp block with render on one side - extrapolated value

You can find all the necessary information concerning our products in our product catalogue. Download the technical data sheets from www.isohemp.com.

AN INSULATING AND EFFECTIVE ENVELOPE

Do you have a building project in mind? Irrespective of the construction system you opt for, the IsoHemp hemp blocks represent a major advantage for your project.
The naturally effective construction and insulation of your building are implemented in a way that guarantees humidity management, thermal and sound insulation, etc.

Discover the benefits and specifics of IsoHemp hemp blocks in the following different construction systems:

- Hempro SYSTEM
- Timber columns-beams
- Metal structure
- Timber framework
- Load-bearing masonry
- CLT timber structure

Our team is at your disposal to assist you in your considerations and performance of the project feasibility study. A construction project is the outcome of lengthy consideration in response to various issues, so let's discuss it first.

THE HEMPRO SYSTEM

With the Hempro system from IsoHemp, there's no need for any other insulating materials. Build the whole building solely with IsoHemp hemp blocks, thanks to a full and extensive range.

The Hempro SYSTEM comprises two types of hemp block of 30 cm thickness: solid blocks and machined blocks (holed blocks and U-blocks). Located in the building envelope, the machined blocks serve as the insulating lost formwork for the structural frame made from the reinforced concrete poured into it.

The holed blocks constitute the formwork for the columns, while the U-blocks allow the beams to be poured that subsequently support the floor and roof.
To achieve even higher thermal performance, a lining with a second masonry layer of hemp blocks of different thicknesses can be planned.

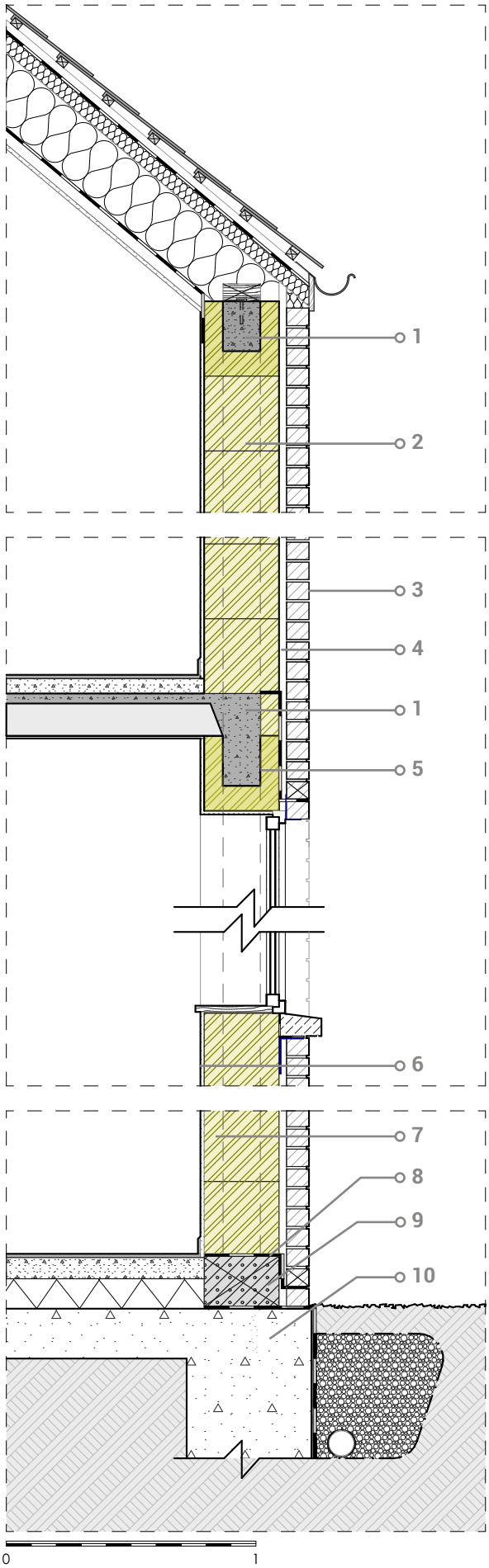
The Hempro system offers a turnkey solution for the quick and easy construction of the associated housing project. The system is perfectly adapted to use by general companies with the lightness of the hemp blocks simplifying on site implementation.

› PERFORMANCE TO MEET YOUR REQUIREMENT

IsoHemp blocks	30	36	30	36	30	36	60	cm
Over-thickness IsoHemp block	-	-	9	9	12	12	-	cm
Wall thickness*	33	39	42	48	45	51	63	cm
Wall R-values	4,43	5,28	5,70	6,54	6,12	6,97	8,66	m²K/W
Wall U-values	0,23	0,19	0,18	0,15	0,16	0,14	0,12	W/m²K

* With interior plaster coating of 1cm and exterior rendering of 2cm.

LOW AND VERY LOW ENERGY PASSIVE



› ADVANTAGES

- ✔ Breathable and homogeneous envelope
- ✔ High insulation value with reduced thickness
- ✔ Rapid and traditional implementation
- ✔ Excellent price/performance ratio

› 30CM ISOHEMP BLOCKS AND FACING BRICKS

1. Reinforced concrete
2. Poured concrete column
3. Facing brick
4. Layer of air
5. 30cm IsoHemp U-block
6. Interior plaster coating
7. IsoHemp holed block 30cm
8. Sealing membrane
9. Rot-proof insulating block
10. Foundation

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

TIMBER COLUMNS-BEAMS

The timber frame offers sustainable construction, economy of resources and is easy to erect.

The association between the timber frame and the hemp blocks occurs naturally by filling in the spaces between the columns using blockwork thus creating a complete, insulating and homogeneous envelope.
The combination is ideal and the two products deliver all of the required performance features when erecting the carcass.

The hemp blockwork is then channelled on the inside to provide the service ducts. Interior and exterior finishes can be applied directly to the hemp blocks.

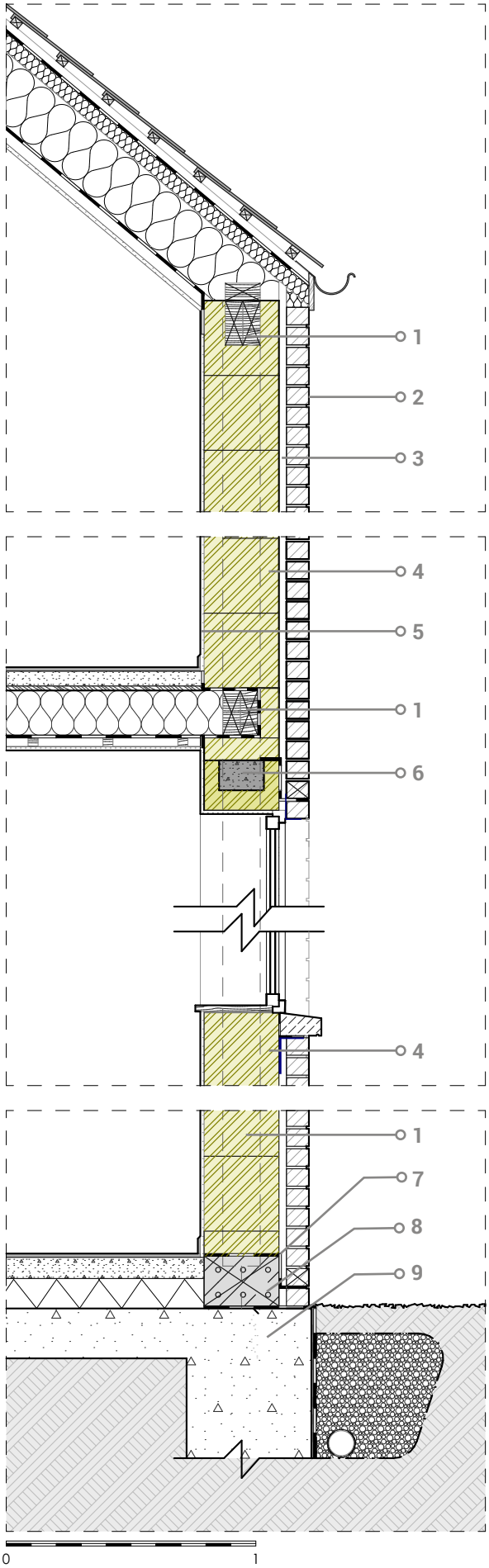
Construction using a columns-beams structure and IsoHemp hemp blocks ensures you will obtain a building that is light, comfortable, environmental and sustainable.

› PERFORMANCE TO MEET YOUR REQUIREMENT

IsoHemp blocks	30	36	30	36	30	36	60	cm
Over-thickness IsoHemp block	-	-	9	9	12	12	-	cm
Wall thickness*	33	39	42	48	45	51	63	cm
Wall R-values	4,43	5,28	5,70	6,54	6,12	6,97	8,66	m²K/W
Wall U-values	0,23	0,19	0,18	0,15	0,16	0,14	0,12	W/m²K

* With interior plaster coating of 1cm and exterior rendering of 2cm.

LOW AND VERY LOW ENERGY PASSIVE



› ADVANTAGES

- ✔ Sustainable and 100% environmental design
- ✔ Lightweight construction with good thermal inertia
- ✔ Ideal for annexes and self-builds
- ✔ Breathable and homogeneous envelope

› 30CM ISOHEMP BLOCKS AND FACING BRICKS

1 Timber structure
2 Facing brick
3 Gap
4 IsoHemp block 30cm
5 Interior plaster coating
6 IsoHemp lintel
7 Sealing membrane
8 Rot-proof insulating block
9 Foundation

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

METAL STRUCTURE

Metallic structures, primarily used for industrial buildings and apartments are becoming more and more widespread in single and multiple-occupancy dwellings. The benefits are:

- Economic solution
- Great architectural flexibility
- Quickly assembled structure

The hemp blocks form a complete and homogeneous envelope around the metallic structure in which bay openings for doors and windows are implemented.

The blocks alone provide:

- The wall (substrate for the finishes) as well as the air sealing
- The thermal and acoustic performance of the building
- The fire protection of the structure

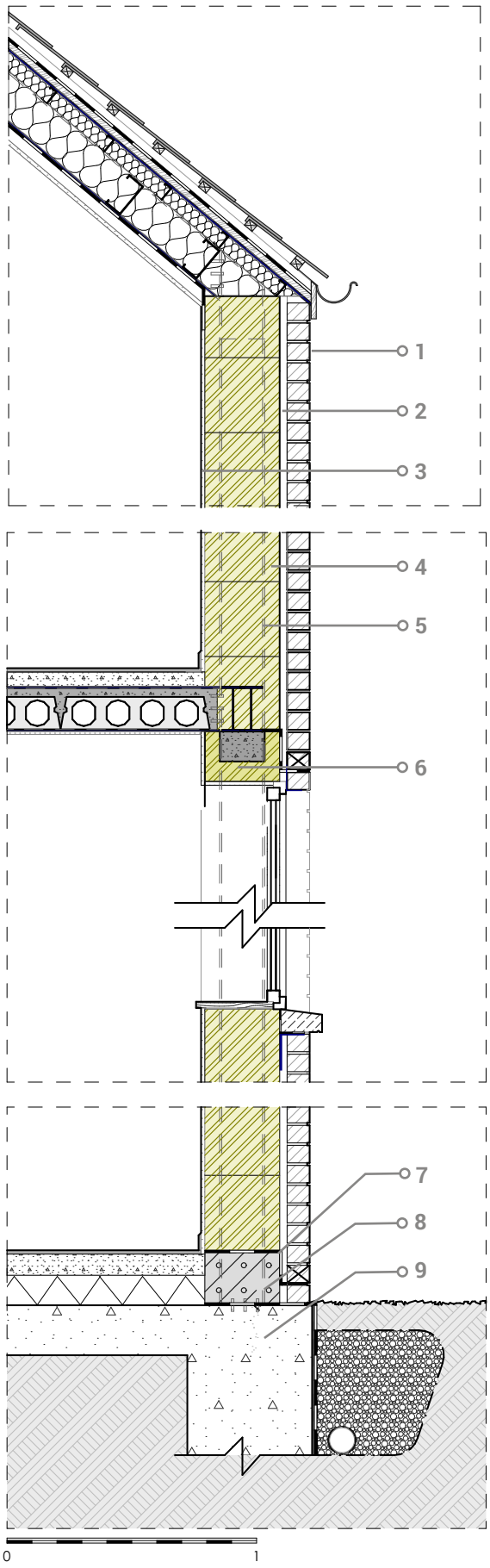
This construction solution ensures the erection of a high-performance building benefiting from a fully breathable, insulating and homogeneous envelope.

› PERFORMANCE TO MEET YOUR REQUIREMENT

IsoHemp blocks	30	36	30	36	30	36	60	cm
Over-thickness IsoHemp block	-	-	9	9	12	12	-	cm
Wall thickness*	33	39	42	48	45	51	63	cm
Wall R-values	4,43	5,28	5,70	6,54	6,12	6,97	8,66	m²K/W
Wall U-values	0,23	0,19	0,18	0,15	0,16	0,14	0,12	W/m²K

* With interior plaster coating of 1cm and exterior rendering of 2cm.

LOW AND VERY LOW ENERGY PASSIVE



› ADVANTAGES

- ✔ Economic solution
- ✔ Quickness of building
- ✔ Breathable and homogeneous envelope
- ✔ Construction of large span structures

› 30CM ISOHEMP BLOCKS AND FACING BRICKS

1. Facing brick
2. Gap
3. Interior plaster coating
4. 30cm IsoHemp block
5. Metal framework
6. 30cm IsoHemp U-block
7. Sealing membrane
8. Rot-proof insulating block
9. Foundation

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

TIMBER FRAMEWORK

The timber framework is for construction of buildings with insulated, load-bearing walls. If these buildings generally benefit from a significant thermal efficiency, they generally have poor thermal inertia due to their lightness. Lining the wall on either the inside and/or the outside with hemp blocks, overcomes this lack of inertia.

Positioning the hemp block on the inside, not only permits insulated lining, but also simplifies the positioning of the service ducts and decorative elements. Moreover, this masonry obviates the need for installation of a vapour barrier because its role is fulfilled by the interior render.

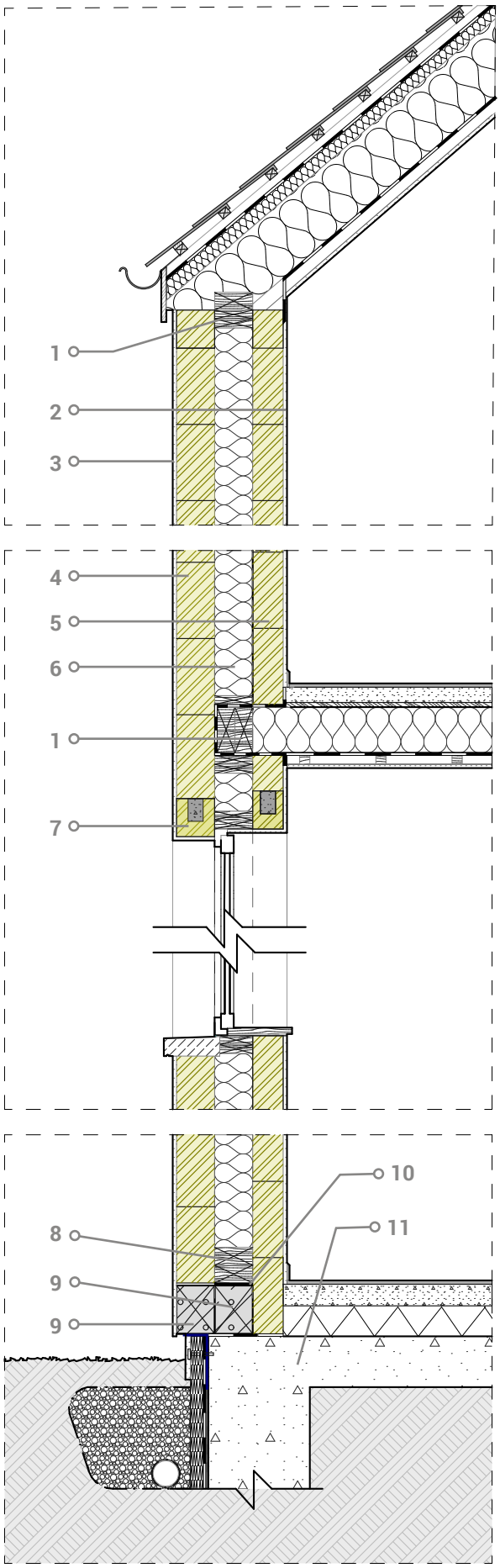
Exterior hemp blocks are an excellent substrate for finishes and attachment of other elements (gutters, basketball hoop, light, etc.) while preventing overheating in the summer.

› PERFORMANCE TO MEET YOUR REQUIREMENT

Envelope IsoHemp block	20	30	OSB panel or fibreboard	15	cm
	14cm insulated timber structur				
Over-thickness IsoHemp block	OSB panel or fibreboard		12	15	12	cm
Wall thickness*	37	47	29	32	44	cm
Wall R-values	6,13	7,54	5,01	5,43	7,12	m²K/W
Wall U-values	0,16	0,13	0,20	0,18	0,14	W/m²K

* With interior plaster coating of 1cm and exterior rendering of 2cm.

LOW AND VERY LOW ENERGY PASSIVE



› ADVANTAGES

- ✔ Significantly improved acoustics
- ✔ Prevention of overheating in summer
- ✔ Simple penetration of service ducts
- ✔ Large choice of finishes

› 12CM INTERIOR AND 15CM EXTERIOR ISOHEMP BLOCKS

1 Timber framework
2 Interior render
3 Parging
4 15cm IsoHemp block
5 12cm IsoHemp block
6 Flexible insulation
7 IsoHemp lintel
8 Timber framework
9 Rot-proof insulating block
10 Sealing membrane
11 Foundation

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

LOAD-BEARING MASONRY

Load-bearing concrete, clay-based or aerated concrete blocks are primarily used for structural envelopes. Nevertheless, these different masonry systems require the implementation of supplementary insulation to meet the thermal requirements of new builds.

It is possible to surround the load-bearing masonry by a resistant envelope made of hemp blocks to:

- Attach the exterior finishes directly onto the insulating blocks: renders, panels, stone facings, etc. thus avoiding creation of cold spots caused metallic hooks
- Ensure constant thermal performance over time thanks to a high quality resistant material
- Prevent any potential problem of compaction or debonding of the insulation in the long term
- Cut off any thermal bridges associated with the floors and outside walls

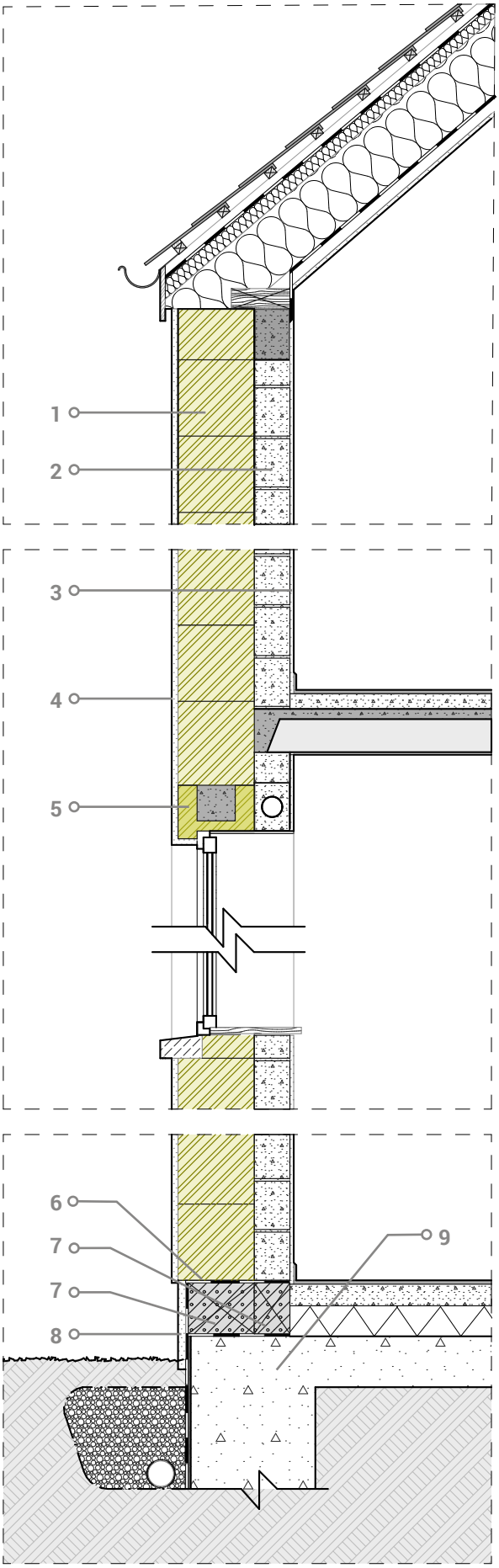
To implement this second envelope, all that is necessary is simply to provide for a sufficient projection beyond the foundation slab and roof to protect and start the hemp blockwork.

› PERFORMANCE TO MEET YOUR REQUIREMENT

	Concrete block 14cm		Clay block 14cm		Aerated concrete block 20cm			
Envelope IsoHemp block	**30**	**30**	**30**	**30**	**25**	**30**	**36**	**cm**
Over-thickness IsoHemp block	**-**	**15**	**-**	**15**	**-**	**-**	**-**	**cm**
Wall thickness*	47	62	47	62	48	53	59	cm
Wall R-values	4,54	6,65	4,91	7,03	5,39	6,10	6,94	m²K/W
Wall U-values	**0,22**	**0,15**	**0,20**	**0,14**	**0,19**	**0,16**	**0,14**	W/m²K

* With interior plaster coating of 1cm and exterior rendering of 2cm.

LOW AND VERY LOW ENERGY **PASSIVE**



› ADVANTAGES

- ✔ Guaranteed stability and durability over time
- ✔ Traditional design
- ✔ Excellent substrate for renders and cladding panels
- ✔ Single trade - masonry

› 14CM CLAY BLOCKS AND 30CM ISOHEMP BLOCKS

1. 30cm IsoHemp block
2. Load-bearing masonry
3. Interior plaster coating
4. Parging
5. 30cm IsoHemp U-block
6. Sealing membrane
7. Rot-proof insulating block
8. Exterior baseboard
9. Foundation

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

CLT TIMBER STRUCTURE

Cross laminated timber (CLT) panels enable the fast erection of a closed carcass and rapid erection of the building structure.

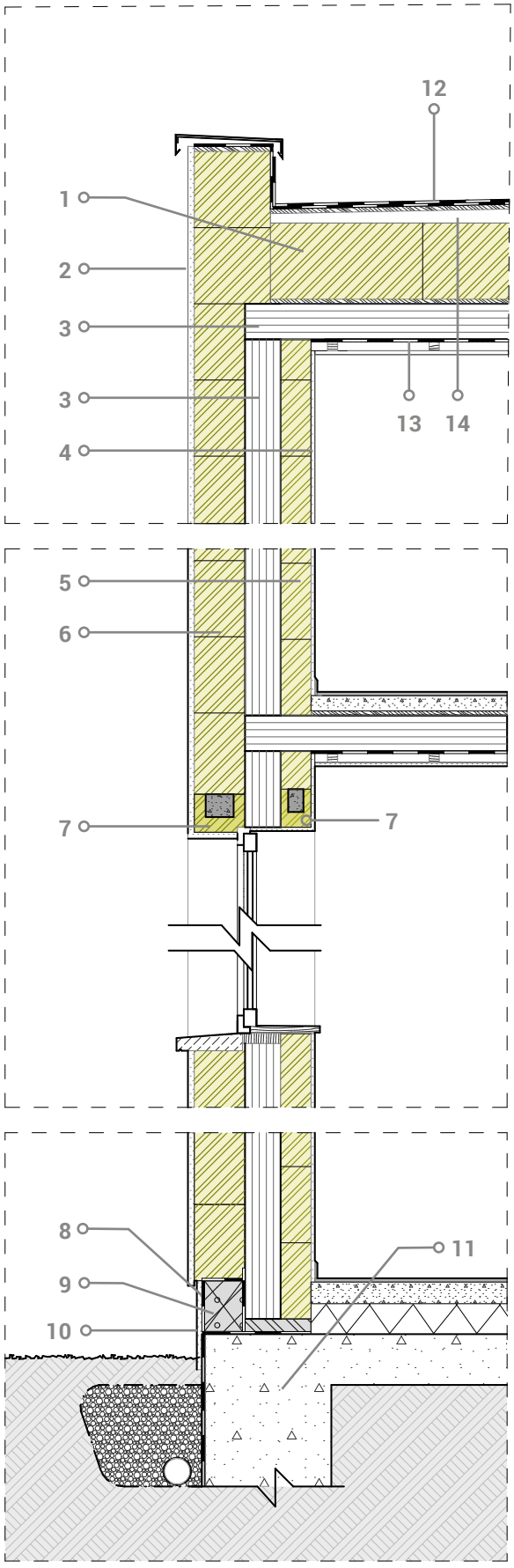
Enveloping the exterior of the CLT with hemp blocks has numerous advantages, in particular a significant improvement in the acoustic behaviour as well as enabling a large choice of finishes: application of blue stones, mineral renders and attachment of elements. At the same time, the hemp blocks let the wood breathe while conserving and protecting it.

To improve the thermal comfort, reduce the sound reverberation and apply an internal plaster coating, we recommend joining of the hemp interior walls and non-load-bearing partitions to the CLT. These interior walls improve the thermal and sound insulation while facilitating the running of the electrical conduit. This joining together enables implementation of projects with a low environmental impact.

› PERFORMANCE TO MEET YOUR REQUIREMENT

Envelope IsoHemp block	30	15	20	30	cm
	CLT 14 cm				
Over-thickness IsoHemp block	-	12			cm
Wall thickness*	47	44	49	59	cm
Wall R-values	5,01	4,59	5,30	6,70	m²K/W
Wall U-values	0,20	0,22	0,19	0,15	W/m²K

* With interior plaster coating of 1cm and exterior rendering of 2cm. LOW AND VERY LOW ENERGY PASSIVE



› ADVANTAGES

- ✔ Rapid construction
- ✔ Significantly improved acoustics
- ✔ Construction nodes mastered
- ✔ Architectural freedom

› 12CM INTERIOR AND 20CM EXTERIOR ISOHEMP BLOCKS

1. 30cm IsoHemp block
2. Parging
3. CLT structure
4. Interior plaster coating
5. 12cm IsoHemp block
6. 20cm IsoHemp block
7. IsoHemp lintel
8. Sealing membrane
9. Rot-proof insulating block
10. Exterior baseboard
11. Foundation
12. Double sealing
13. Vapour barrier
14. Screed

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

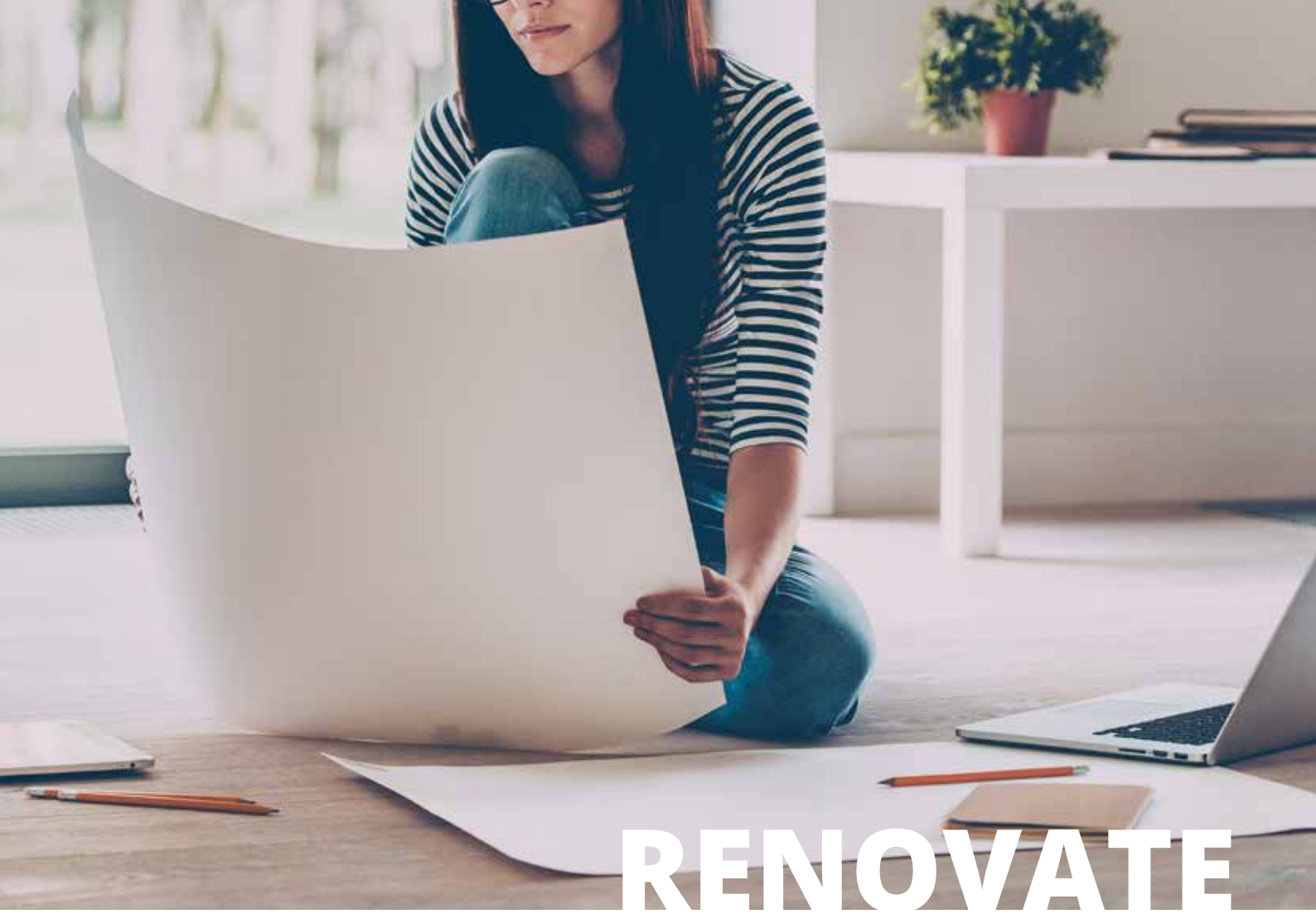
We are still at the carcass stage, but **we are very satisfied with the hemp blocks**. Even at this stage we can sense the real comfort provided by our walls. Supplementary but not insignificant advantages are the very good acoustics of the product and the easy fastening to the blocks."

Alexandre – Owner and self-builder – Belgium

We have benefited from technical support, provided by IsoHemp engineers, who are always ready to listen and be proactive.

They helped us to check the feasibility of our project."

Julie Goffin – Kiss Architects – Belgium



RENOVATE

A HIGH PERFORMANCE AND INSULATING LINING

Do you have a renovation project in mind? Think about effective insulation.
To avoid any problem (condensation, leaks, etc.), special attention must be paid to ensuring a good match between the existing walls and the newly applied materials.

Thanks to the IsoHemp hemp blocks, the naturally effective renovation of your building is ensured in a way that guarantees humidity management and thermal and sound insulation.

Discover the benefits and specifics of IsoHemp hemp blocks in your renovation projects:

- Interior renovation
- Exterior renovation
- Extension

Our team is at your disposal to assist you in your considerations and the design of your project. A renovation project must be based on respect for the existing materials and responding to the objectives of an accurately specified performance, let's talk about it.

INTERIOR RENOVATION

IsoHemp hemp blocks provide efficient and high performance solutions for managing technical challenges during the implementation of an interior renovation, whether for urban development requirements or preservation of the exterior façade.

When carrying out an interior renovation, all the energy dynamics of the building may be changed. Indeed, it is possible to completely disturb the thermal and moisture regulating behaviour of the wall, create construction nodes or condensation points on the floors or outside walls.

Applying an internal lining to existing walls using hemp blockwork avoids problems that are inherently associated with condensation. Both the permeability of the block and its absorption are part of its main advantages. It also ensures excellent conservation of the old building.

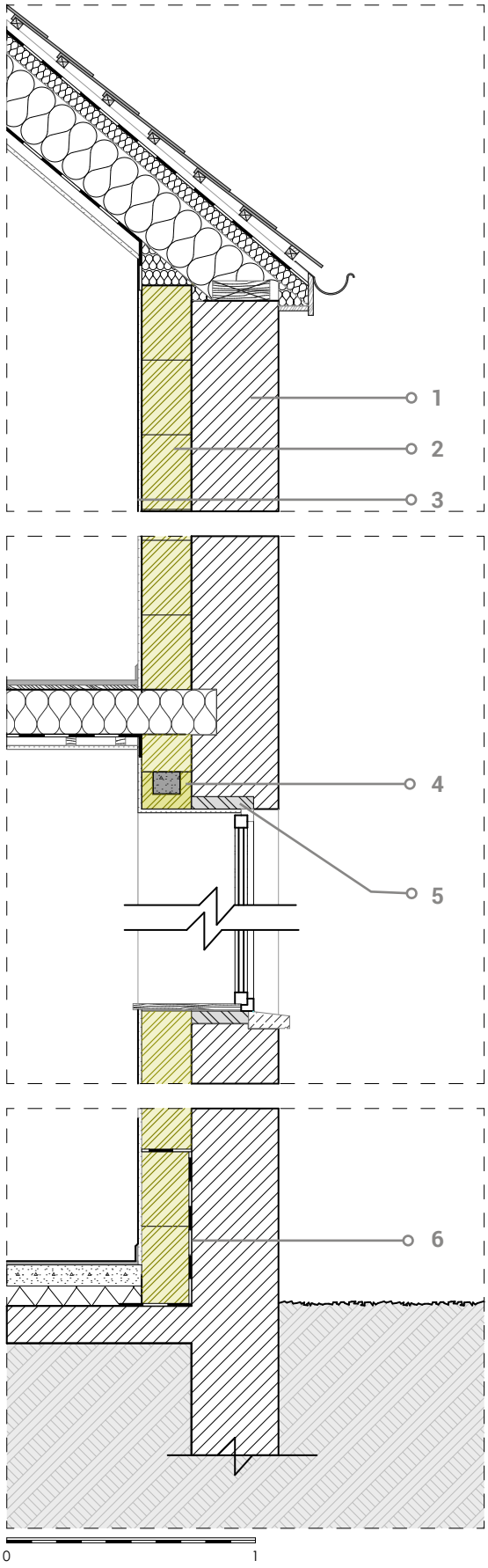
Moreover, interior renovation using hemp blocks does not require a lot preparation work. The blocks are easy to build, even for DIY renovations, ensuring the outcome is plumb walls. Once built against the existing wall, they can easily be channelled so that service ducts can be buried. Then they can be coated to achieve the desired finish.

To obtain perfect continuity of the wall and allow effective migration of water vapour, the gap between the existing wall and the masonry blocks should ideally be filled by a mortar made of lime and hemp.

› PERFORMANCE TO MEET YOUR REQUIREMENT

Envelope IsoHemp block	9	12	15	20	25	30	36	cm
Total thickness*	10	13	16	21	26	31	37	cm
Block R-values	1,29	1,71	2,13	2,84	3,54	4,24	5,09	m²K/W

* With an interior coating of 1cm.



› ADVANTAGES

- ✔ Simple, economic and ecological solution
- ✔ No condensation or dew points
- ✔ Healthy inside environment
- ✔ Simple penetration of service ducts and fasteners

› 20CM INTERIOR ISOHEMP BLOCKS

1. Existing building
2. 20cm IsoHemp block
3. Interior plaster coating
4. IsoHemp lintel
5. Thermal insulation
6. Sealing membrane

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

EXTERIOR RENOVATION

IsoHemp hemp blocks deliver high performance and effective solutions for managing technical challenges during the implementation of outside renovation. The renovation of the envelope of a building enables significant reductions in heating, ensures effective airtightness and continuity of the insulation while removing all thermal bridges.

When an exterior renovation is performed, you unavoidably change the energy dynamics of the building. Impairments or changes to the moisture regulating behaviour of existing walls can arise when creating an envelope made of insulating material. Thus, the hemp blocks offer a good level of isolation, while at the same time still allowing the walls to breathe whether they be made of brick or stone, for example.

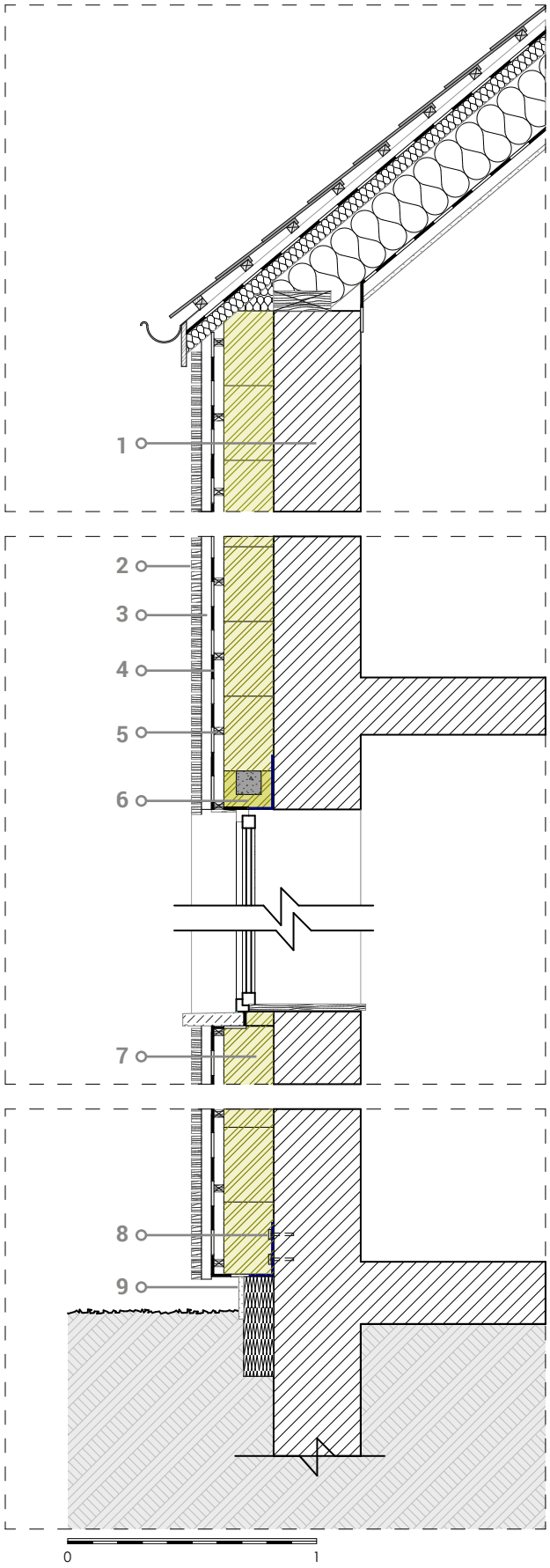
Moreover, exterior renovation offers many other advantages such as a large choice of finishes. The hemp blocks are perfectly suited to the application of exterior renders but also to the fitting of cladding panels which can be directly fixed into the new hemp blockwork. This supports the load of the panels and avoids penetration into the insulating layer by the fasteners. Exterior woodwork as well as heavy sills made of blue stone or concrete may be included directly in the hemp blockwork.

Applying an insulating exterior lining is the best solution for achieving high thermal performance for the whole building while avoiding any chance of thermal bridging.

› PERFORMANCE TO MEET YOUR REQUIREMENT

Envelope IsoHemp block	9	12	15	20	25	30	36	cm
Total thickness*	11	14	17	22	27	32	38	cm
Block R-values	1,28	1,71	2,13	2,83	3,54	4,24	5,09	m²K/W

* With an exterior render of 2cm.



› ADVANTAGES

- Resistance of the insulating envelope
- Support for panels, substrate for renders and stones
- Environmental and sustainable solution
- Regulation of the wall moisture

› 20CM EXTERIOR ISOHEMP BLOCKS

1 Existing building
2 Cladding
3 Counter laths
4 Rain barrier
5 Lathing
6 IsoHemp lintel
7 20cm IsoHemp block
8 Metal angle
9 Baseboard + glued insulation

The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged. Do not hesitate to contact our technical service.

Thanks to IsoHemp hemp blocks, you can quickly perform all your extension projects and benefit from all the advantages of an extension that is perfectly insulated and efficient.

An extension offers many advantages such as: being easy and quick to build, providing a new pleasant living space, providing architectural adaptability and freedom of choice of the building system.

Discover the benefits and specifics of IsoHemp hemp blocks in the following different construction systems:

- Hempro SYSTEM
- Timber structures
  - > Timber columns-beams
  - > Timber framework
- Load-bearing masonry

See the previous pages of this guide for all the details of these systems.

INTERIOR WALLS

BUILD YOUR INTERIOR WALLS

In building just as in renovation, choose IsoHemp hemp blocks for your interior masonry. Building your walls or dividing your rooms with IsoHemp hemp blocks ensures the benefits of lightness, simplicity and good sound insulation.

Hemp blocks are an ideal solution for:

- Interior walls of multiple dwellings and flats/apartments
- Partition walls of residential housing
- Interior walls of industrial buildings

Our team is at your disposal to assist you in your considerations and performance of the project feasibility study. Interior walls fulfil numerous functions but there is a solution for all your needs, so let's discuss it.

FLATS & APARTMENTS

To separate residential units and thermally and/or acoustically insulate them, different solutions can be envisaged dependent on whether the wall must be able to support a floor or not.

Load-bearing walls are built using conventional masonry or using load-bearing walls elements that are then lined with hemp blocks that have a certain separation from the load-bearing wall. The gap will be filled with flexible mineral wool insulation to ensure an optimum acoustic outcome.

Non-load-bearing walls are built as double masonry walls of hemp blocks separated by flexible insulating mineral wool. The two walls are held together by fastenings embedded in the masonry joints.

NB : As the sound insulation depends directly of the applied coating, the latter must be continuous to ensure an optimum result. Do not hesitate to contact us to check your technical details.

› PERFORMANCE TO MEET YOUR REQUIREMENT

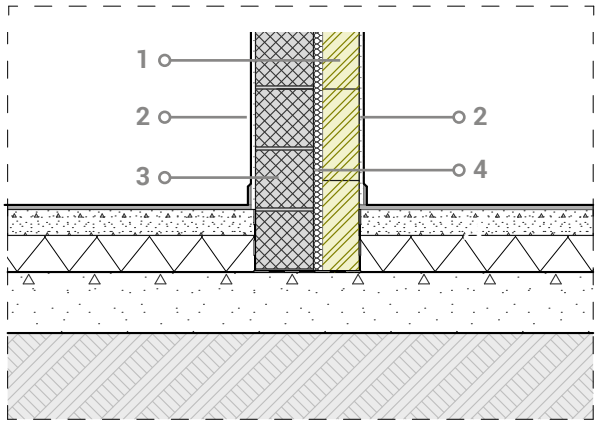
	SOLUTION 1			SOLUTION 2		
Load-bearing block or IsoHemp blocks	**Sand-lime 21.4cm**			**9**	**12**	**cm**
Gap	**Mineral wool 3cm**			**Mineral wool 3cm**		
IsoHemp blocks	**9**	**12**	**15**	**12**	**15**	**cm**
Total thickness*	36,4	39,4	42,4	26	32	cm
Wall R-values	2,14	2,59	3	3,66	4,51	m²K/W
Fire resistance*	120	120	120	120	120	min

* With a coating of 1cm on both sides.

› ADVANTAGES

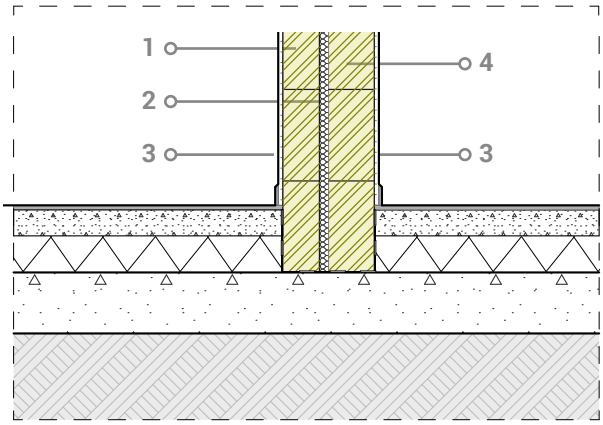
- Economic And Sustainable Solution
- Good Sound Insulation
- Quickness Of Building
- Numerous Finishing Options

› SOLUTION 1
LOAD-BEARING MASONRY AND ISOHEMP BLOCKS



1 12cm IsoHemp block
2 Interior plaster coating
3 Load-bearing masonry
4 Flexible insulation

› SOLUTION 2
DOUBLE WALL OF ISOHEMP BLOCKS



1 12cm IsoHemp block
2 Flexible insulation
3 Interior plaster coating
4 15cm IsoHemp block

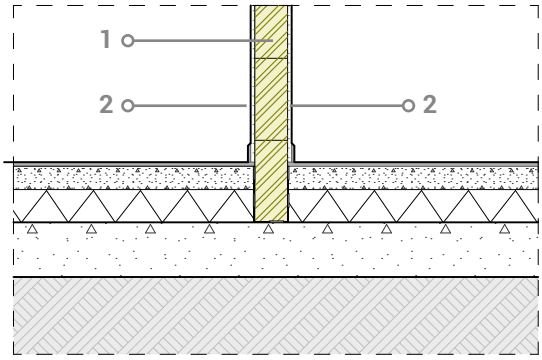
The performance table and the technical cross-section represent examples of construction systems. Other solutions can be envisaged.
Do not hesitate to contact our technical service.

RESIDENTIAL PARTITION WALLS
INTERIOR WALLS

Partition walls made of hemp blocks are ideal in many configurations, especially when the aim is a high level of sound insulation or when the weight of the interior walls must be low. They are also recommended to provide thermal inertia in "light" projects which otherwise would tend to suffer from significant thermal variations.

The masonry is built on concrete or wooden floors before the floor is insulated. They are built straight up and stiffened by the geometry of the walls (angles). The greater the length to height ratios, the thicker the partition must be to ensure optimum strength.

The continuity of the coating ensures optimum sound insulation.



1 12cm IsoHemp block
2 Interior plaster coating

› PERFORMANCE TO MEET YOUR REQUIREMENT

Envelope IsoHemp block	9	12	15	20	25	30	cm
Total thickness*	11	14	17	22	27	32	cm
Wall R-values	1,31	1,73	2,15	2,86	3,56	4,26	m²K/W
Reaction to fire*	A2						
Fire resistance*		60		120			min
Sound attenuation**	38	39	40	42	43	44	dB
Sound absorption	0,85						

* With a coating of 1cm on both sides. ** With a coating on one side - extrapolated value.

INDUSTRIAL BUILDINGS

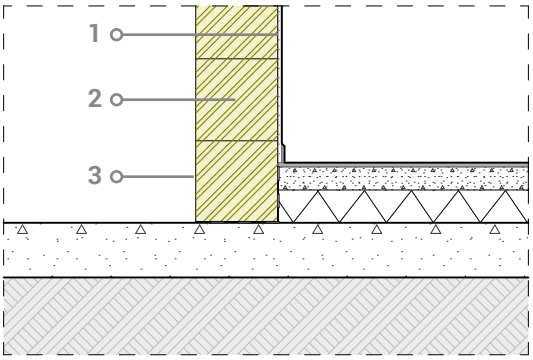
INTERIOR WALLS

The requirements relating to the layout of industrial buildings or offices are generally high and there are numerous points to consider:

- Thermal: heating or not of the rooms
- Acoustic: noisy workshop and quiet office
- Fire: Protection required for two or more hours
- Resistance: fastening of cableways, etc.

Hemp blocks fulfil all of these specific requirements and ensure the high thermal performance of dividing walls - between offices and unheated spaces for example.

The masonry can remain bare, be rendered or plastered or also spray painted for optimum acoustic absorption.



1 Interior plaster coating
2 20cm IsoHemp block
3 Paint

› PERFORMANCE TO MEET YOUR REQUIREMENT

Envelope IsoHemp block	20	25	30	36	cm
Total thickness*	21	26	31	37	cm
Wall R-values	2,84	3,54	4,24	5,09	m²K/W
Reaction to fire*	A2				
Fire resistance*	120				min
Sound attenuation**	42	43	44	45	dB
Sound absorption	0,85				

* With a coating of 1cm on one side - extrapolated value. ** With a coating on both sides.

I used hemp blocks for the first time following a request from one of my clients who wanted to use them in his building project. **I discovered a product with very advantageous properties that is easy to build with**. A very nice alternative for internal partition walls."
David Loir – Dream Architecture - Belgium

The hemp provides a genuine sensation of comfort.

It creates a warm atmosphere, there isn't anything else like it."
Brigitte – Owner – France

FLOOR & ROOF

HEMP BLOCKS FOR FLOOR AND ROOF INSULATION

Both for new builds and renovations, IsoHemp hemp blocks offer numerous advantages for insulation of both floors and flat roofs. A solution that is easy and quick to implement.

Our team is at your disposal to assist you in your considerations and the design of your project. Insulation of the ground floor and the roof is of paramount importance in ensuring your increased thermal comfort, let's talk about it.

FLOOR

Used as a floor insulator, hemp blocks offer a resistant and durable solution. It is recommended that they are located directly on a surface protected against rising damp and then to cover them with a compression cap.

There are two floor design techniques:
- Place the hemp blocks on a sealed concrete foundation slap
- Place the hemp blocks on a draining block or granular fill

The latter technique is economical and means that a base/foundation slap can be completely omitted.

The floor insulation hemp block can be combined with number types of cap (cement, lime or clay). It is also suitable for the running of service ducts and the installation of underfloor heating.

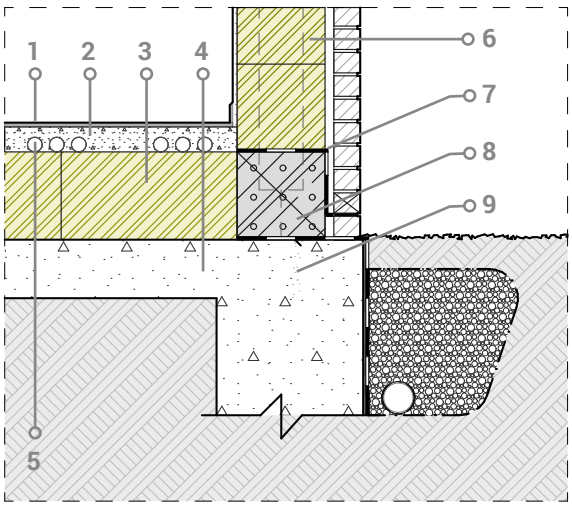
› PERFORMANCE TO MEET YOUR REQUIREMENT

	Cap 8cm							
IsoHemp blocks	**30**	**30**	**15**	**20**	**30**	**15**	**20**	**cm**
Medium	**Concrete foundation slab 20cm**	**Stabilised 3cm**						
		35 cm draining block of pebbles	**35cm draining block of expanded clay**			**35cm draining block of cellular glass**		
Thickness	58	76	61	66	76	61	66	cm
R-values	4,55	4,46	4,84	5,55	6,96	6,45	7,17	m²K/W
U-values	0,22	0,22	0,21	0,18	0,14	0,15	0,14	W/m²K

› ADVANTAGES

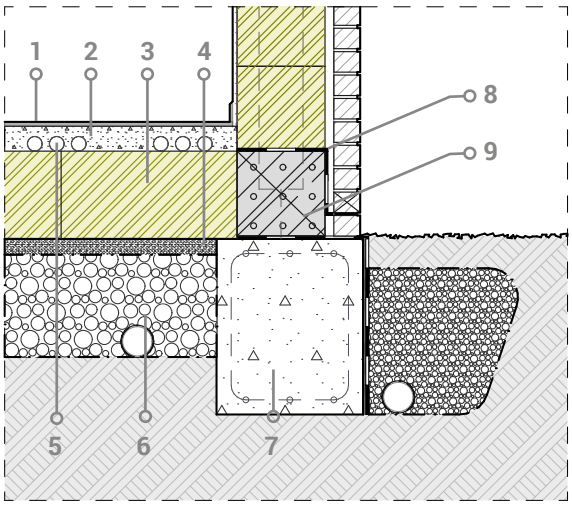
- ✔ Speed and ease of implementation
- ✔ Durable solution
- ✔ Compatibility with underfloor heating
- ✔ High strength without compaction over time

› SOLUTION 1
FLOOR INSULATION OVER CONCRETE FLOOR SLAB



1 Finish
2 Cap 8cm
3 30cm IsoHemp block
4 Slab on soil
5 Underfloor heating/ service ducts
6 Outside wall
7 Sealing membrane
8 Rot-proof insulating block
9 Foundation

› SOLUTION 2
FLOOR INSULATION OVER DRAINING BLOCK



1 Finish
2 Cap 8cm
3 30cm IsoHemp block
4 Stabilised
5 Underfloor heating/ service ducts
6 Draining block
7 Foundation
8 Sealing membrane
9 Rot-proof insulating block

The performance table and the technical cross-sections represent examples of construction systems. Other solutions can be envisaged.
Do not hesitate to contact our technical service.

FLAT ROOF

Hemp blocks placed in the flat roof provide excellent thermal comfort thanks to their significant thermal inertia.

Consequently, they prevent overheating of the building in the summer, improve the sound insulation by reducing airborne noise and ensure constant technical performance over time.

To insulate a flat roof with hemp blocks, all that is required is to position blocks of the desired thickness on the support. The latter may be made of concrete or solid timber. A screed, with or without thermal properties is then be poured in-situ. A sealing layer is placed on the screed according to the requirements of the manufacturer.

NB : During load calculation, it is important to take into account the total weight of the implemented solution.

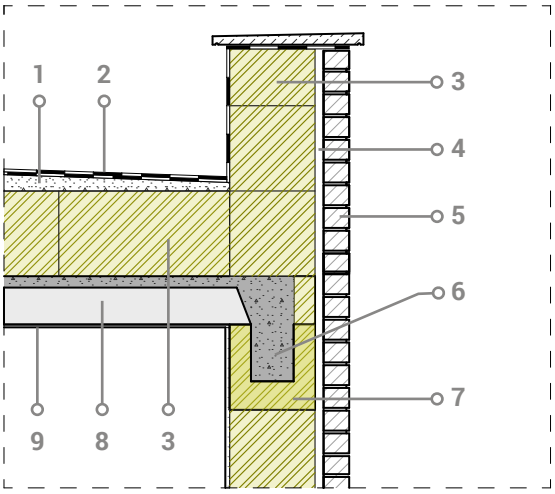
› PERFORMANCE TO MEET YOUR REQUIREMENT

Screed	Isolated slope concrete 10cm	Isolated slope concrete 6cm	Non-insulated slope concrete 4cm	
IsoHemp blocks	**20**	**30**	**30**	**cm**
Medium	Reinforced concrete slab			
Total thickness	30	36	34	cm
Lining R-values	4,36	5,22	4,43	m²K/W
Lining U-values	0,23	0,19	0,23	W/m²K
Lag, IsoHemp blocks	13,1	19,7	19,7	h
RC, IsoHemp blocks	300			kPa

› ADVANTAGES

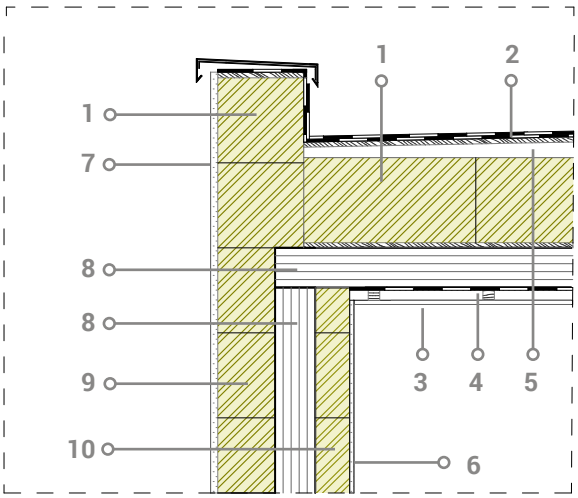
- ✔ Environmental and sustainable solution
- ✔ Addition of inertia to the roof
- ✔ High resistance to compression
- ✔ Sound insulation against airborne noise improved

› SOLUTION 1
LOAD-BEARING CONCRETE STRUCTURE



1 Screed
2 Double sealing
3 30cm IsoHemp block
4 Gap
5 Facing brick
6 Reinforced concrete
7 30cm IsoHemp U-block
8 Load-bearing structure
9 Coating

› SOLUTION 2
LOAD-BEARING TIMBER STRUCTURE (CLT)



1 30cm IsoHemp block
2 Double sealing
3 False ceiling
4 Vapour barrier
5 Screed
6 Interior plaster coating
7 Parging
8 CLT structure
9 15cm IsoHemp block
10 12cm IsoHemp block

The performance table and the technical cross-sections represent examples of construction systems. Other solutions can be envisaged.
Do not hesitate to contact our technical service.

REFERENCES SITES

SPECIFIC FUNCTIONALITIES FOR YOUR SITE

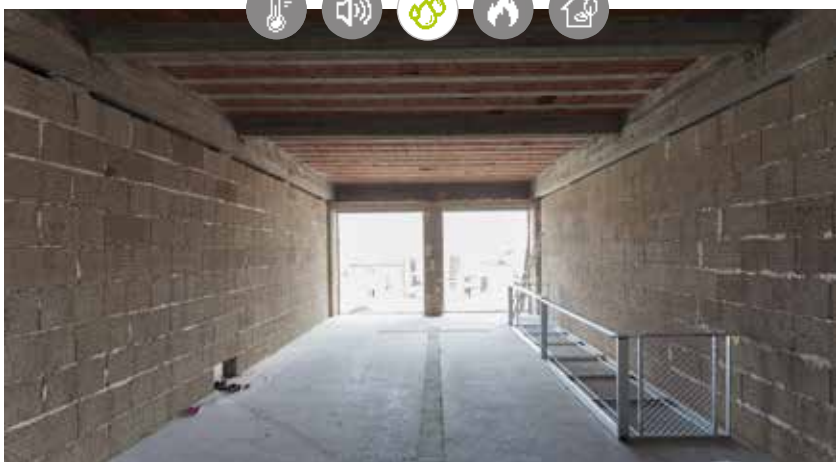
Do you have a specific challenge on your site/project? Hemp blocks can definitely provide a solution! Their multiple features simplify the systems to be installed and guarantee constant maintenance-free performance.

We invite you to visit our various reference projects with multiple applications such as:

- Detached houses
- Multi-occupancy dwellings
- Industrial buildings
- Office buildings
- Product storage (archiving rooms, works of art, food, etc.)
- Schools

Would you like to visit one of our reference sites to find out more? Let's arrange it. Our team is at your disposal to assist you in designing your project.

›REDEVELOPMENT OF OFFICES INTO HOMES



Project: 15cm and 30cm hemp blocks were used in the internal renovation of two floors of a former post office converted into a cohousing association of 9 very low energy loft apartments. A complete interior envelope was constructed using hemp blocks as well as all the interior dividing partitions made of double hemp blockwork with flexible insulation between the two layers of blocks. The result: optimum sound insulation and fire protection walls. Also, the natural interior plaster IsoHemp was used as an internal finish.
Architect: Lode Vranken and Giulia Caterina Verga
Year completed: 2017
Location: Brussels, Belgium

›INTERIOR LINING OF AN ARCHIVE STORE

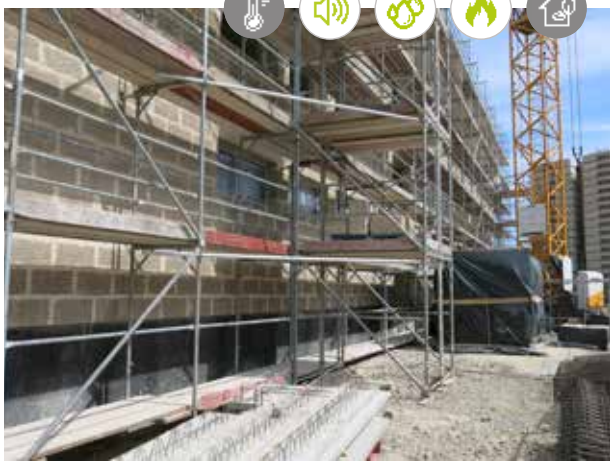
Project: Construction of the extension of a Flemish Government store. The aim of this building is to conserve sensitive objects (archives, etc.) in ideal temperature and humidity conditions. 6cm thick hemp blocks were used to line the entire 1200m² surface area of the interior walls of the building.
Architect: Ar-Te Architecture
Year completed: 2017
Location: Vilvoorde, Belgium

REFERENCE SITES

›TIMBER APARTMENTS BUILDING

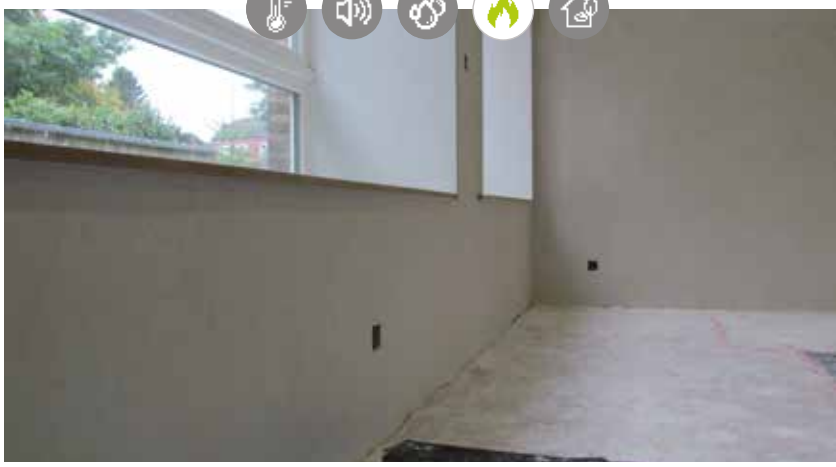
Project: New build of an apartment block make of CLT timber with 30cm hemp blocks for the outer envelope. The client wanted natural breathable insulation. The interior partitions were all made using 12cm hemp blocks to improve the acoustics of the living spaces.
Architect: David Loir - Dr(ea)²m
Year completed: 2018
Location: Pont-à-Celles, Belgium

›OFFICE BUILDING GROUND FLOOR + 3



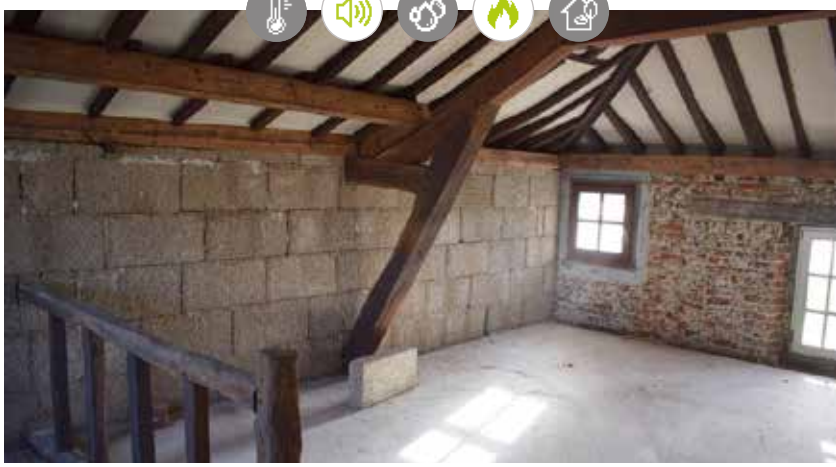
Project: New build of a commercial building in 30cm hemp blocks and load-bearing structure of concrete blocks. For use as a logistics centre and numerous offices.
Architect: Colette Boever Architecte
Year completed: 2018
Location: Contern, Luxembourg

› THERMAL AND SOUND INSULATION OF A SCHOOL



Project: Interior renovation using 20cm hemp blocks of a school and classrooms. Interior finishing performed using IsoHemp's PCS natural interior plaster coating. The thermal and sound insulation of the brick building was considerably improved.
Architect: Commune d'Havelange
Year completed: 2017
Location: Havelange, Belgium

› RENOVATION OF A TIMBER AND BRICK BARN



Project: Complete interior renovation of an old barn using 15cm hemp blocks. Preservation of the inner look as well as the original frame while avoiding any potential condensation problems or degradation of the wooden framework. Interior finishing with natural lime-based plasters.
Architect: DAO Architecture sprl
Year completed: 2017
Location: Scoumont, Belgium

REFERENCE SITES

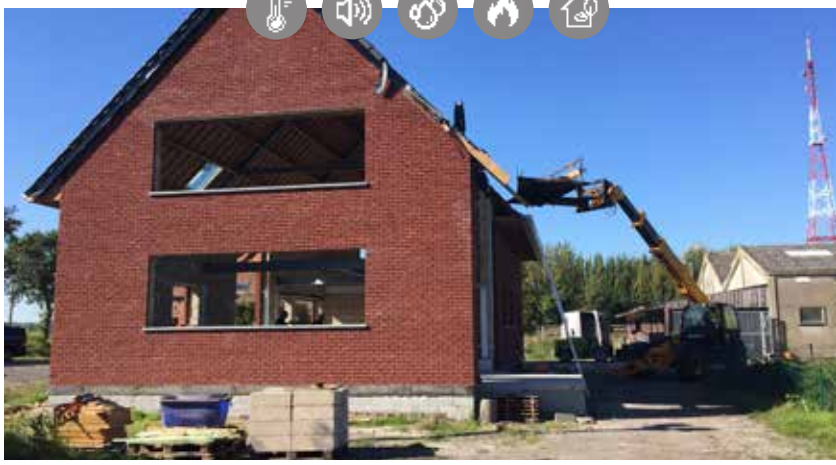
›LOW ENERGY DETACHED VILLA

Project: New build in 30cm hemp blocks laid in the envelope of load-bearing concrete blockwork. The client wanted a strong and insulating substrate for application of the exterior finishes. He chose hemp blocks for application of a lime-based render and attachment of the facing stones directly to the insulating block without creating any thermal bridging.
Architect: Albert & Lambin Architectes
Year completed: 2016
Location: Paliseul, Belgium

›TWO VERY LOW ENERGY DETACHED HOUSES

Project: New build of two very low energy houses with a timber column-beam structure with a complete single wall outer envelope of 42cm made from hemp blocks (12cm + 30cm). Lime render exterior finish.
Architect: Karbon Architecture et Urbanisme
Year completed: 2016
Location: Ottignies, Belgium

›DETACHED VILLA WITH A METAL STRUCTURE



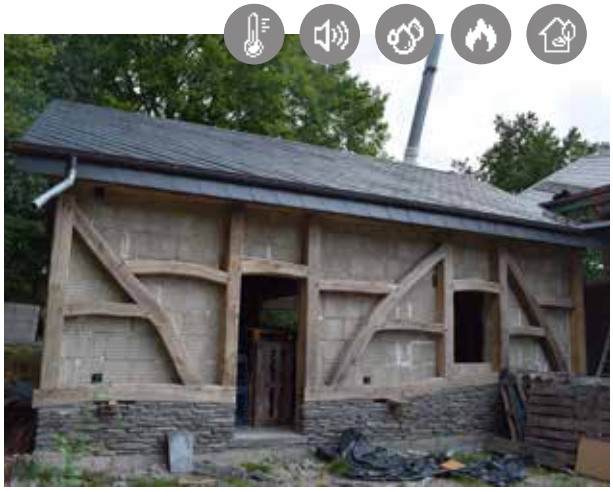
Project: Building of a very low energy detached house with a metal load-bearing structure and complete 30cm + 9cm hemp block envelope with an exterior finish of facing bricks. Selection of an economic structure that can be quickly installed, without compromising the efficient performance of the building envelope.
Architect: Luc Leleu
Year completed: 2018
Location: Vleteren, Belgium

›MODERN PASSIVE VILLA

Project: New build implemented with the IsoHemp Hempro system. Construction system comprising concrete columns-beams poured directly into 30cm hemp blocks. A supplementary envelope of 20cm thickness was built to achieve a home meeting the passive building standard.
Architect: Julie Goffin - Kiss-Architects
Year completed: 2018
Location: Lives-Sur-Meuse, Belgium

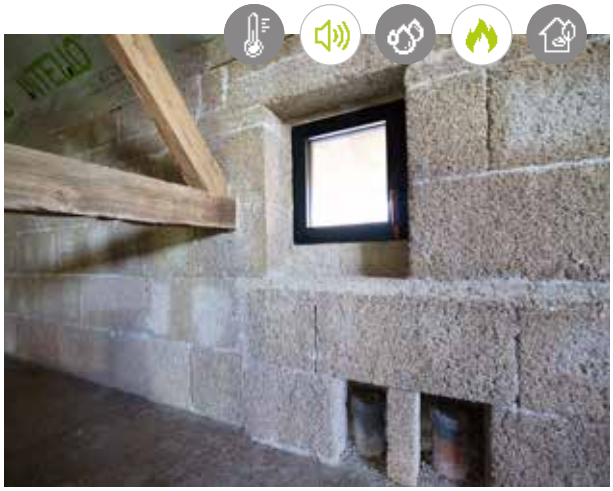
REFERENCE SITES

›TIMBER FRAME DETACHED HOME



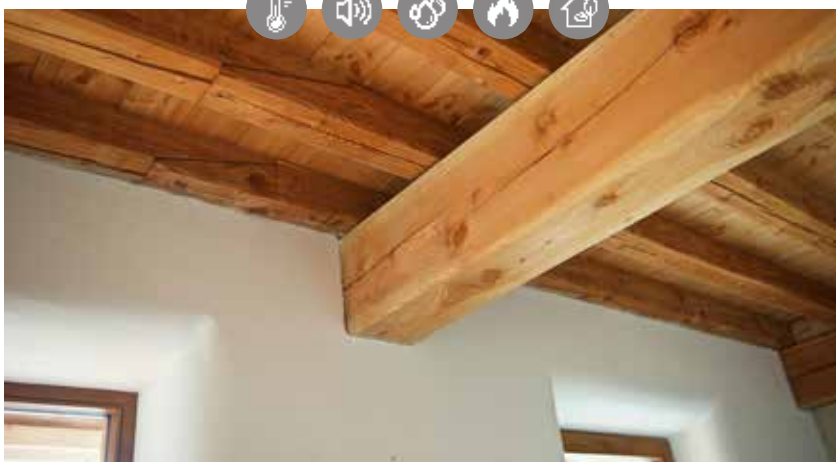
Project: New build of a detached home with a timber columns-beams structure and hemp blocks of 20cm and 30cm. Low energy house with exterior facing of stones attached directly to the insulating block.
Architect: Michel Rémy
Year completed: 2018
Location: Lierneux, Belgium

›HOME INTERIOR RENOVATION



Project: Renovation of an old half-timbered farmhouse with hemp blocks. A complete interior envelope was built using 15cm hemp blocks. This solution avoids any potential condensation problem or degradation of the timber frame.
Architect: /
Year completed: 2018
Location: Limbourg, Belgium

›TIMBER FRAME DETACHED HOUSE



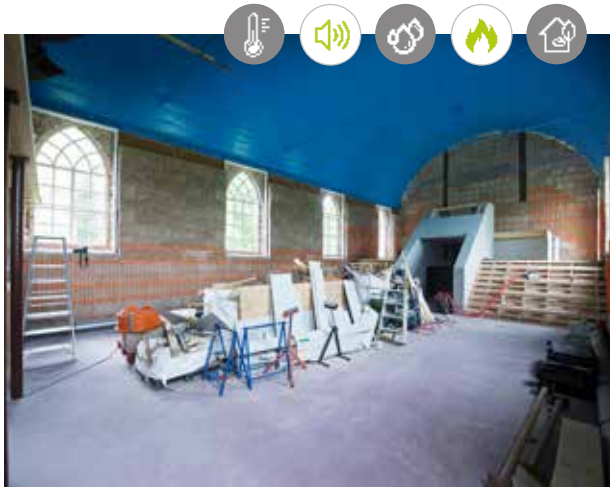
Project: New build of a detached house. Combination of a formwork of hemp concrete and hemp blocks. Load-bearing columns-beams structure and timber framework. Interior and exterior lime-based finishes.
Architect: Platform M² Architecten
Year completed: 2018
Location: Ede, The Netherlands

›INTERIOR RENOVATION OF AN OLD FARMHOUSE

Project: Interior renovation and restoration of an old farmhouse (previously a pig farm) using 20cm hemp blocks. Preservation of the external look of the building in authentic old stones. Application of an interior lime-based plaster.
Architect: /
Year completed: 2018
Location: Fougères, France

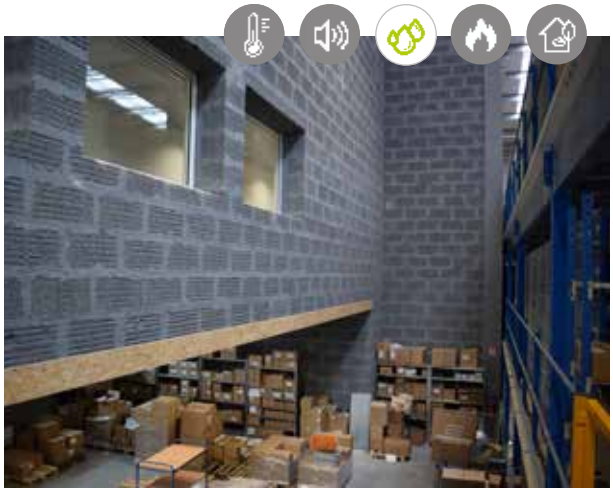
REFERENCE SITES

›REDEVELOPMENT OF AN OLD CHURCH



Project: Low energy renovation of an old church. Interior insulation provided by 30cm hemp blocks. Wall heating and interior clay-based finish.
Architect: Reinier de Gooijer
Year completed: 2018
Location: Kloosterburen, The Netherlands

›INTERIOR WALLS BETWEEN OFFICES AND WORKSHOP



Project: Construction of blockwork, 30cm x 25 metres wide x 14 meters high forming a division between heated offices and a storage area. This unique blockwork provides simultaneous thermal and sound insulation of the two spaces while complying with fire safety standards. The blockwork was plastered on one side and spray painted on the other to achieve optimum sound absorption.
Architect: Colette Boever Architecte
Year completed: 2018
Location: Contern, Luxembourg

NOTES

ISOHEMP
NATURAL BUILDING

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