

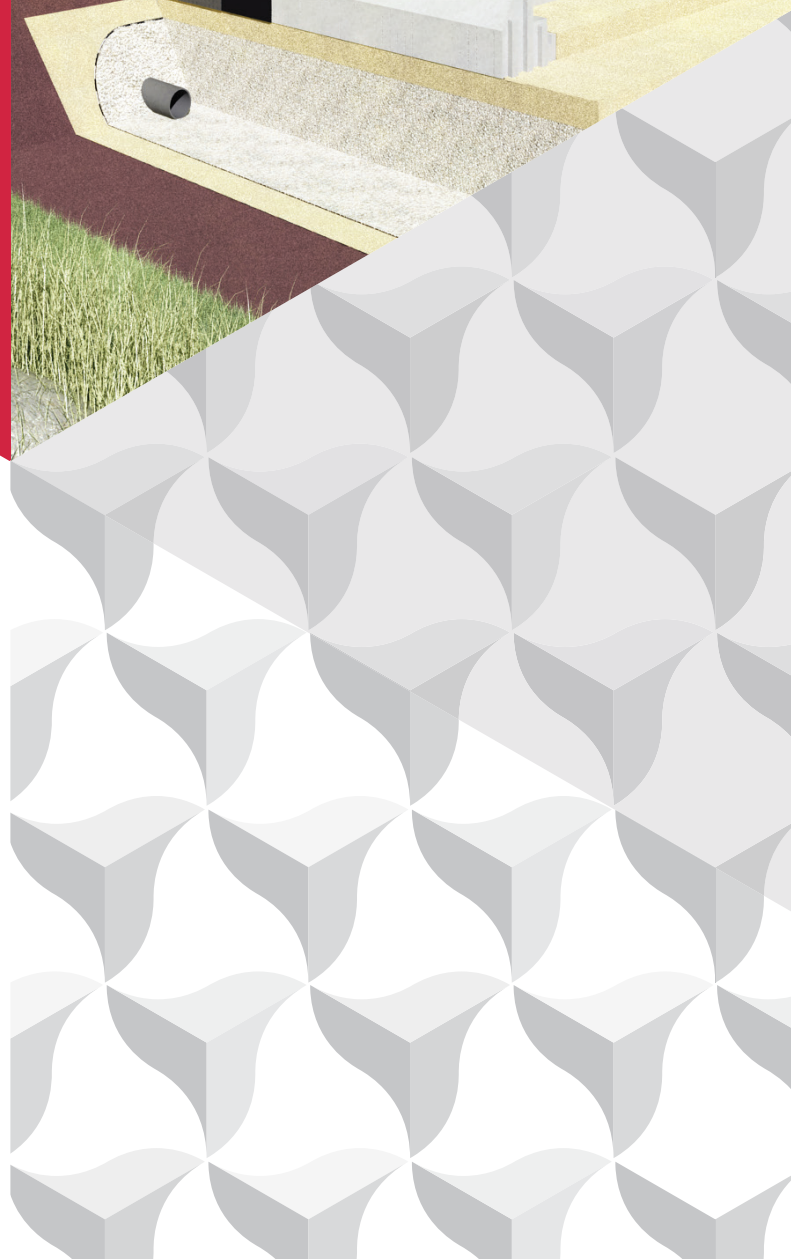
So good, even
mother nature
would approve...

Passivhaus Raft Foundation System



econeKT
THE INTELLIGENT BUILDING SYSTEM

INSULATED CONCRETE FORMWORK (ICF)



Ground slab

Izodom 2000 Polska

$U_0 = 0,09-0,14 [W/m^2K]$

Ground slabs are the newest product offered by Izodom 2000 Polska. They may be successfully used instead of traditional continuous strip footings and foundation walls. These are concrete slabs cast at the construction site, and reinforced with steel fibre reinforcement or classic steel rods. For their manufacture, basic formwork elements produced by Izodom are used, which makes it possible to obtain varied slab shapes – in accordance with the design project for the structure being built. The designer determines the class of concrete and quantity of steel

fibre reinforcement. The thickness of the reinforced concrete ground slab is 25 cm. In exceptional cases, at the request of the designer – it is possible to increase the thickness to as much as 40 cm by the use of a special overlay that increases the height of the edge element – and thus increasing the thickness of the slab. Insulation thickness can be increased by a further 6, 8, 10 or 12 cm, using auxiliary ground slabs. In addition, auxiliary slabs can be extended beyond the outer contour of the executed ground slab to a distance of about 1.5 m in order

to ensure further protection against the possibility of the soil under the ground slab freezing. Thanks to these elements being made in moulds, they feature accurate and repeatable dimensions, and their assembly is simple and fast.

Advantages of the ground slab:

1.Speed of execution.

By using our components it is possible to significantly reduce the time of foundation construction: even by 2-3 days!

2.Stability

The ground slab is a monolithic element and is much more stable than the currently designed continuous strip footings and foundation walls.

3.Easier thermal and damp protection

The slab is easier to insulate – there is no need for additional vertical and horizontal insulation applied in the execution of traditional continuous strip footings and foundation walls.

4.Ease of execution

The slab is an element whose extremely simple structure precludes the possibility of making mistakes.

5.Shallow positioning of slabs

Thanks to the possibility of positioning slabs at a depth of just 0.5 m, it is possible to reduce the scope and duration of earthworks.



Technology recommended by Poland's Ministry of the Environment

Izodom 2000 Polska

GREENEV
AKCELERATOR ZIELONYCH TECHNOLOGII



About Izodom and its other products



FOUNDATIONS

The ground slab is designed for those who want a durable building foundation constructed speedily with excellent insulation. Edge elements, corners and bottom slab elements are used to build a shuttering, which is filled with concrete. This provides the most durable and most energy-efficient building foundation available on the Polish market, which is characterized by a favourable heat transfer coefficient of $U=0.14W/m^2K$. The shallow depth of the foundation and unprecedented damp proofing allows one to build where traditional foundations would be impossible due to high groundwater levels.

Benefits:

- as much as a 90% saving in energy
- fast construction, only 2-3 days
- ideal damp proofing protection for the building
- possibility of building in difficult ground conditions



WALLS

We can supply a wide range of elements for wall construction, in varied thicknesses. These enable the construction of external and internal walls with an energy class from energy-saving ($U=0.15W/m^2K$) to passive ($U=0.10W/m^2K$). Durability is guaranteed by a 15 cm monolithic concrete wall, and unprecedented energy efficiency is provided by up to 30 cm of Neopor – the best insulating foam in its class.

Benefits:

- perfect for any project
- absolutely no thermal bridging
- walls require no extra insulation
- no mortars, adhesives, staples or unnecessary reinforcement, which reduces costs
- combination of high construction durability and energy efficiency
- short construction time



ROOFS

25 cm thick panels ensure insulation of $U=0.13W/m^2K$ – as in a passive house. These are large ($1.7 m^2$) and lightweight, making for quick assembly. A well-designed combination of roof insulation with insulated walls and a hook system for joining panels allows construction that prevents formation of thermal bridges, and provides drainage of moisture from under the roof covering. You select the roofing method – roof tiles or steel sheets, and we will help choose a suitable type of insulation panel.

Benefits:

- ideal thermal insulation, without undesirable leakages
- excellent protection of the building against damp
- simple and quick assembly



How to build a ground slab

Building structures with the use of ground slab formwork elements is a very simple process, and one that saves time. The main stages are:

Stage 1: Preparation

Removal of humus and subsoil to a depth consistent with the design documentation. Precise positioning of the plumbing and sewers and other media. Performance of this work requires due care in order to avoid removal of the already executed internal installation shafts in the building at a later stage of construction. Using coarse grain gravel or key aggregate we execute a bedding layer, arranging the material in layers, each layer being carefully compacted. The recommended thickness of the bedding layer is 15-20 cm. Then on top of this bedding layer we lay a sand layer (3-4cm). After the sand has been levelled and compacted we lay damp proofing using 0.6 mm thick plastic sheet. The edges of the plastic sheet are laid on the slope of the bedding layer to ensure

maximum security of the slab against negative effects of moisture. Instead of a bedding layer we can execute a backing layer with a thickness of about 15 cm using lean concrete.

Stage 2: Assembly of formwork

Formwork insulating elements are laid in such a way as to obtain the desired size and shape of the slab. The shape of the slab is formed in 5 centimetre module. Bottom elements are joined to each other and to the edge stones using hook locks. Edge elements and corners are joined using dovetail locks. To obtain the desired size of the elements, we cut them with a wood saw or a special thermal cutter (available from Izodom).

Stage 3: Circular drainage

We execute circular drainage in the foundation trench, as close as possible to the lower edge of the bedding layer. The diameter of the drainage pipes and their distance from the designed walls must be in accordance with the documentation. Drains should be laid on the sand

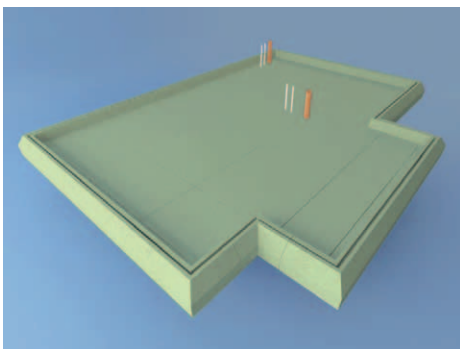
bed and filled over with gravel or coarse grain sand. Drainage is necessary only in cases where the level of groundwater is higher than the bottom of the filter layer.

Stage 4: Reinforcement

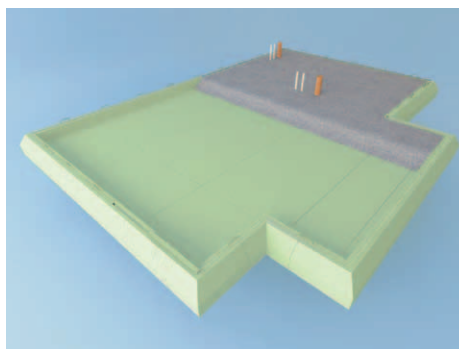
We execute reinforcement of the slabs according to the documentation. This may be a fibre reinforcement or traditional reinforcement in the form of steel mesh or classic reinforcement using steel rods, or a combined solution using both these two solutions, or combined solutions involving the application of all the above solutions together.

Stage 5: Concrete filling

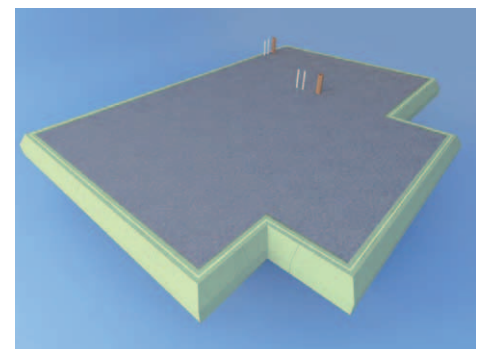
We fill the formwork with concrete of a suitable class and consistency – always in accordance with the design and the concrete manufacturer's recommendations. We fill the slots with shapes made of insulating material, available from the company.



Insulation of the ground slab



Structural layers of the ground slab



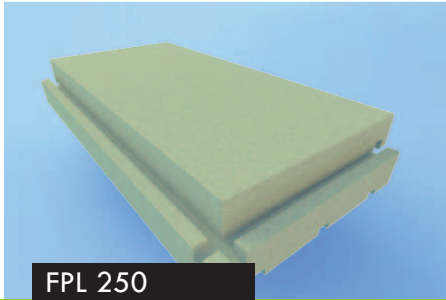
Ready ground slabs

In operation since 1991, Izodom 2000 Polska has provided materials for the construction of more than 17,000 structures from the Middle East to northern Norway, from Western Europe to Siberia.

The technology offered by the Company is featured in the Polish Ministry of Environment's GreenEvo program and in the European Commission's EU Gateway program (as one of the 40 best technologies in the construction industry). The company is a signatory to the „Caring for Climate” document – an initiative of the Secretary-General of the United Nations and UNDP.

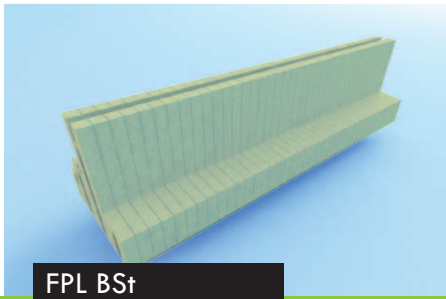
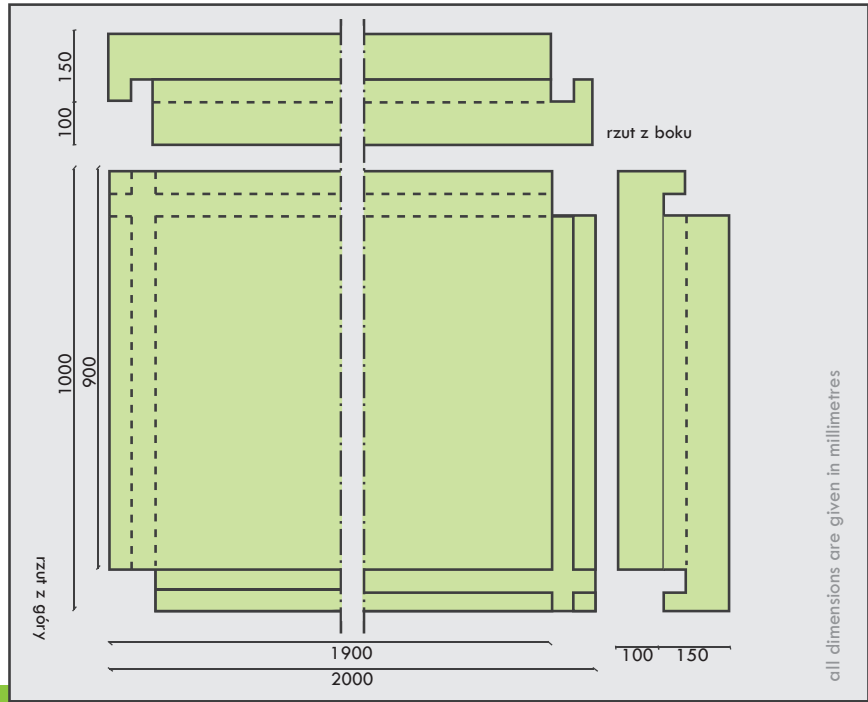
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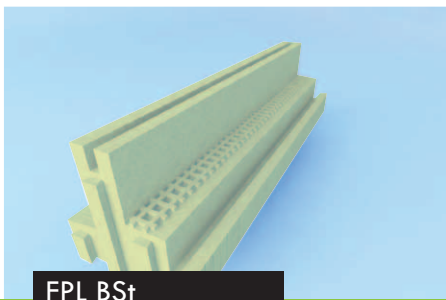
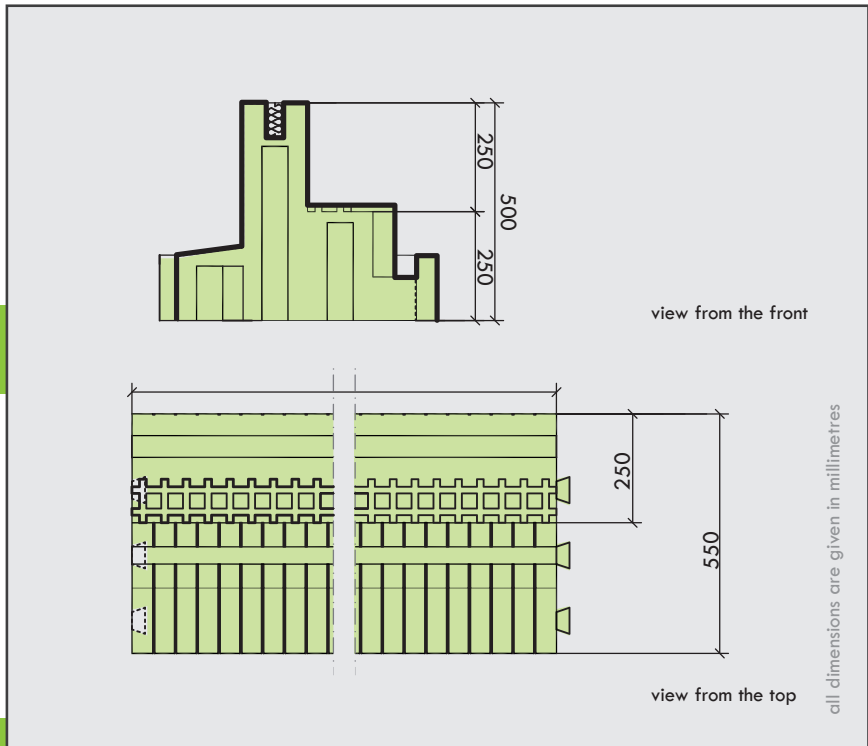
FPL 250

Ground slab
190 x 90 x 25 [cm]



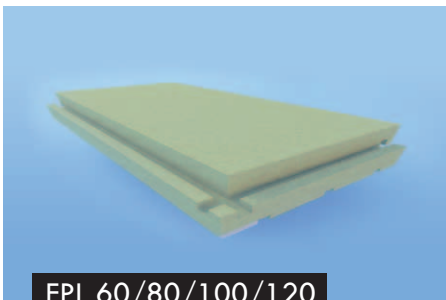
FPL BSt

Ground slab 195 x 55 x 50 [cm]



FPL BSt

Edge stone - view from the inner
sid 195 x 55 x 50 [cm]



FPL 60/80/100/120

Auxiliary ground slab
195 x 95 x 6/8/10/12 [cm]

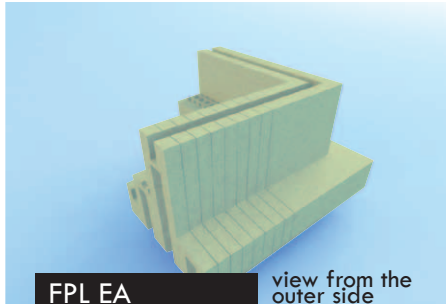
Available thicknesses of auxiliary ground slab	
Symbol	Dimensions (length x width x thickness) [cm]
FPL 60	195 x 95 x 6
FPL 80	195 x 95 x 8
FPL 100	195 x 95 x 10
FPL 120	195 x 95 x 12



FPL EA

view from the inner side

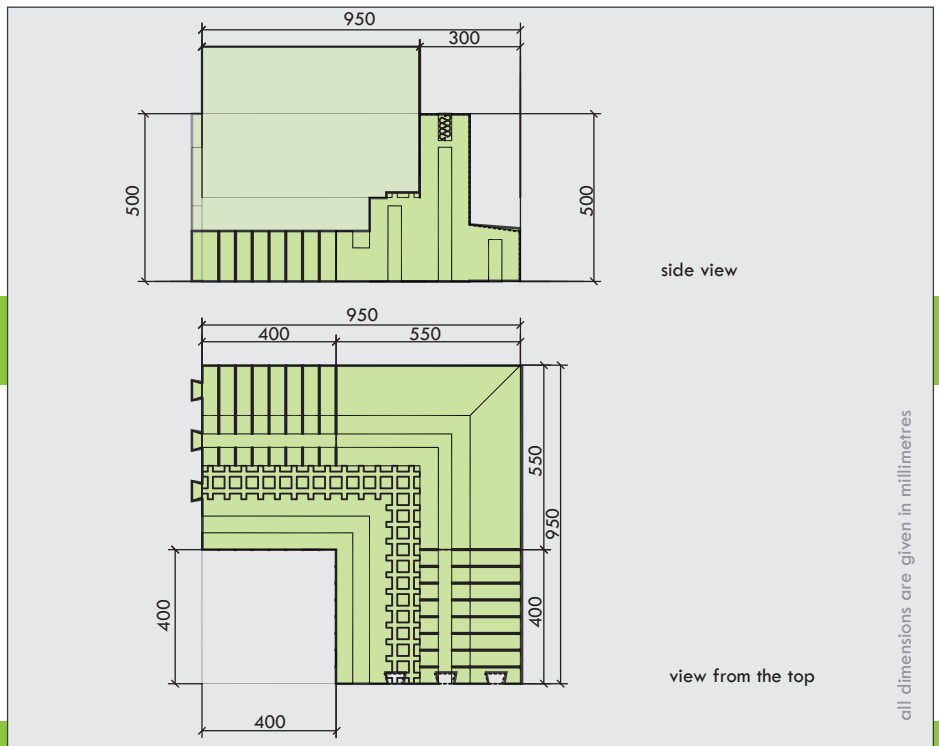
Outer corner
95 x 95 x 50 [cm]



FPL EA

view from the outer side

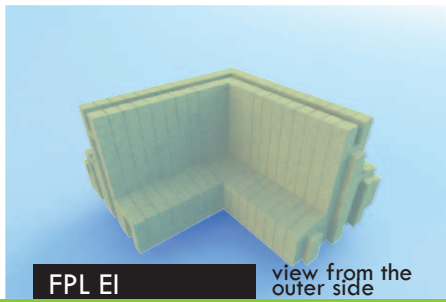
Outer corner
95 x 95 x 50 [cm]



side view

view from the top

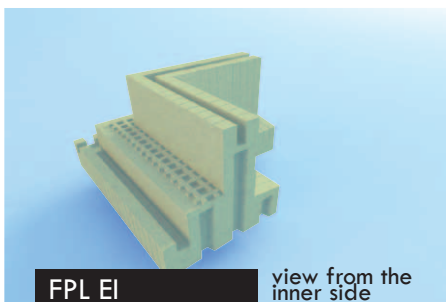
all dimensions are given in millimetres



FPL EI

view from the outer side

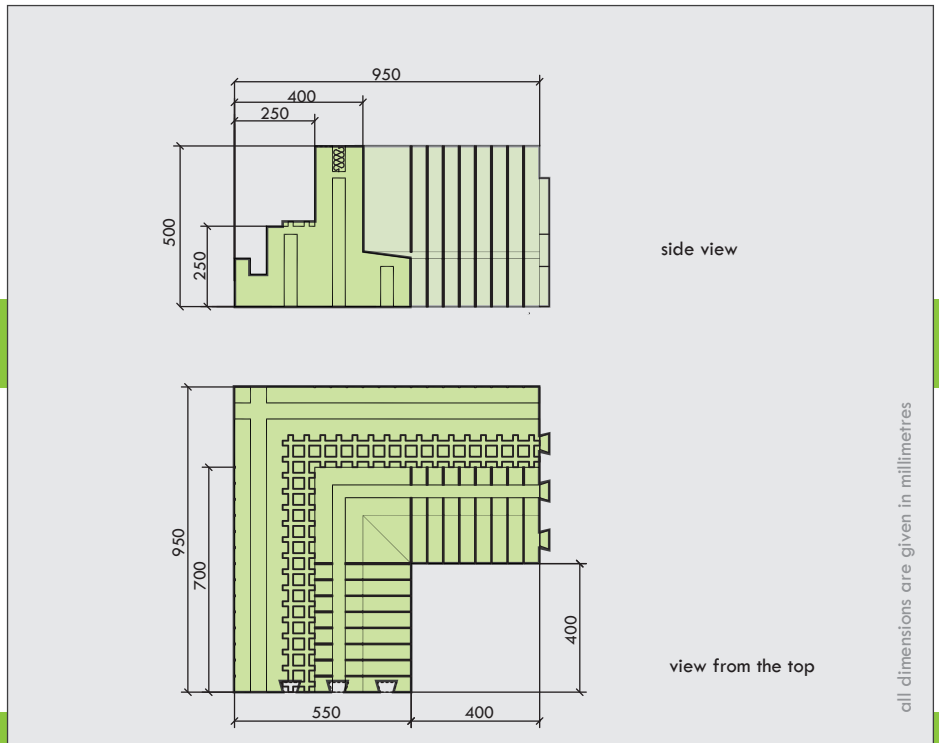
Inner corner
95 x 95 x 50 [cm]



FPL EI

view from the inner side

Inner corner
95 x 95 x 50 [cm]



side view

view from the top

all dimensions are given in millimetres

Thickness [cm]	U_o [W/m ² K]
25	0,14
25+6	0,11
25+8	0,10
25+10	0,10
25+12	0,09

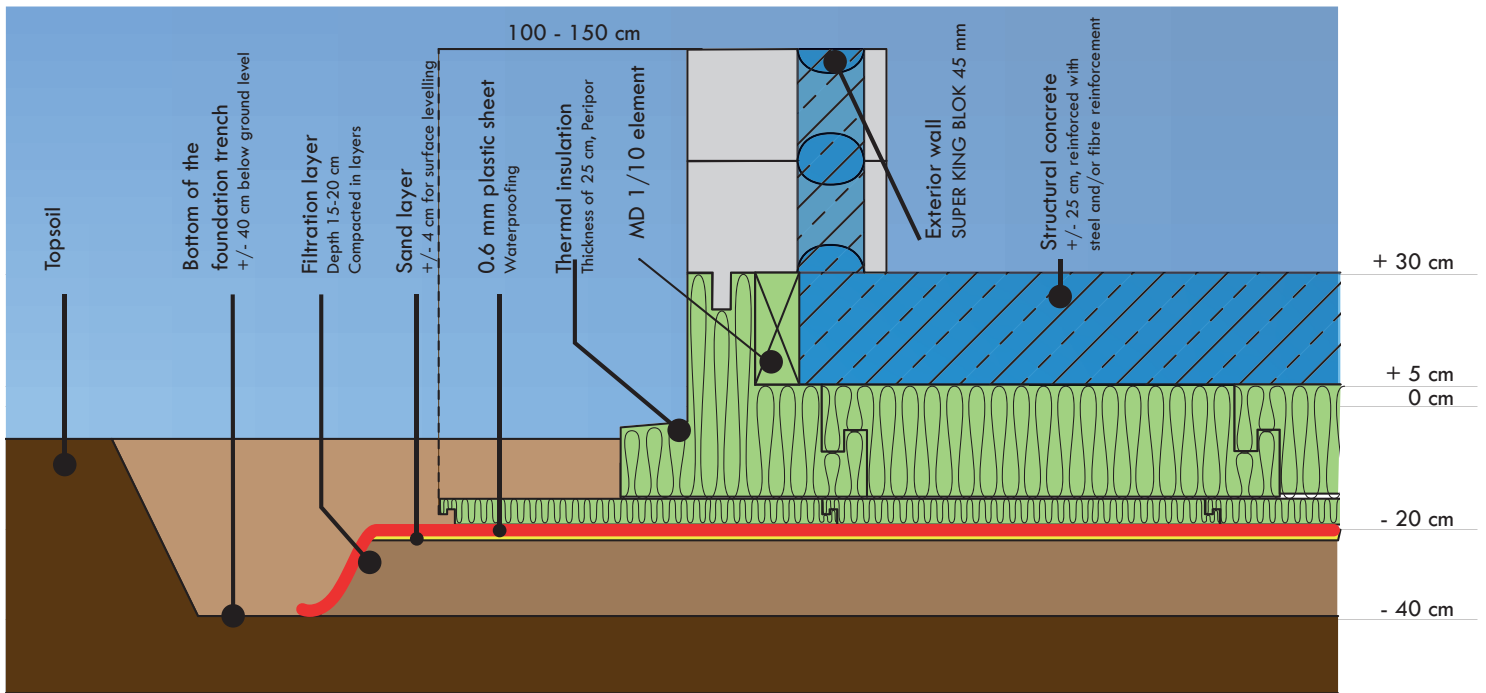


Figure 1 Diagram showing execution of the ground slab in the version with 45 cm wide external walls (Super King Block)

Those building a passive house most often use appropriately thick and warm walls made of Izodom Super King Block $U_o = 0.10 \text{ W/m}^2\text{K}$ and a ground slab with additional insulation. The heat transfer coefficient of such a foundation can be as high as $0.09 \text{ W/m}^2\text{K}$, making it the warmest foundation in Europe.

An additional MD element increases the thickness of the edge stone and facilitates a bridgeless connection between slab and wall. In case of high ground water level, one can use additional waterproofing in the form of construction sheet.

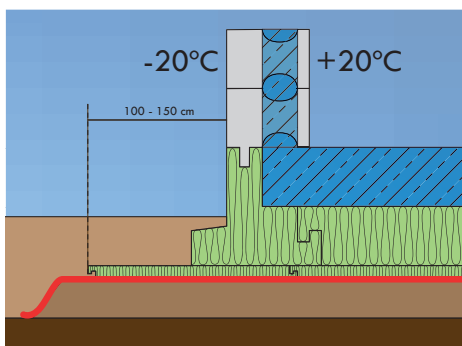
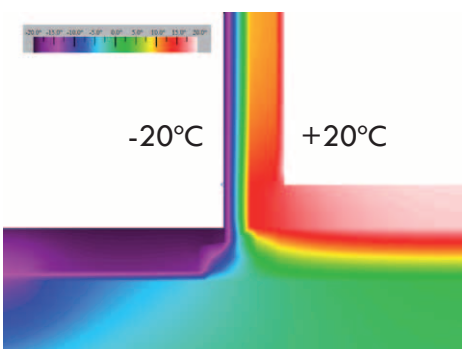


Figure 2 Diagram showing execution of a slab type foundation with additional thermal insulation. Traditionally, in order to protect a building from frost heave phenomena, the foundation walls are built with foundations below the so-called „freeze depth”, i.e. at a depth of 1-1.4 m. The idea is to prevent frost from „getting below the building”. A more effective solution is to shift the FPL (6- 12cm) insulation panel some 1-1.5 m beyond the contours of the building. We then obtain a substantial extension of the so-called „freeze path”. This treatment means we even more effectively protect the building, avoiding deep and expensive excavations.



When building an energy efficient house, one may use Izodom King Block $U_o=0.15 \text{ W/m}^2\text{K}$ wall elements and a ground slab.

The illustration above shows the temperature distribution in the ground, at -20°C (in blue). A thick layer of thermal insulation under the building provides efficient protection against frost penetration beneath the building, freezing and frost heave phenomena. This is why ground slabs are so popular in Scandinavian countries.

Declared properties

Essential characteristics of the intended application, for thermal insulation in construction	Declared performance properties, class or level	Testing standard	Harmonized technical specification
Dimension tolerance class:			
Thickness	T2 (± 2 mm)	EN 823	
Length	L4 (± 4 mm)	EN 822	
Width	W3 (± 3 mm)	EN 822	
Squareness	S5 (± 5 mm/1m)	EN 824	
Flatness	P10 (10 mm)	EN 825	
Level of bending strength	BS 450 (≥ 450 kPa)	EN 12089	
Class of dimensional stability under constant normal laboratory conditions	DS(N)5 - ($\pm 0,5$ %)	EN 1603	
Level of dimensional stability under specific conditions – a temperature of 70 °C, 48 hrs	DS(70,-)2 - (≤ 2 %)	EN 1604	PN-EN 13163:2013-05E
Compressive stress at 10% deformation	CS(10)300 - (≥ 300 kPa)	EN 826	
Declared thermal conductivity λ_D	0,034 W/(mK)	EN 12667	
Deformation at 80 °C and at a pressure of 20 kPa	DLT(1)5 - (5 %)	EN 1605	
Behaviour under long-term compressive stress at 30 kPa (= 3 tons/m ²)	2 % odkształcenie względne dla pełzanie przy ściskaniu	EN 13163	
Water absorption under total immersion	WL(T)3 3 %	EN 12087	
Coefficient of water vapour diffusion	MU70	EN 13163	
Reaction to fire class	EUROKLASA E	EN 11925-2	PN-EN 13501-1:2007+A1:2009

The above table is a collection of test results for ground slab elements. The results show that Izodom products are very carefully manufactured, extremely resistant to pressure, guarantee damp proof protection and excellent protection against the cold

The raw material

Ground slab elements are made of Peripor, which has excellent insulating properties. At the same time this material is resistant to moisture and considerable external loads. Thanks to these properties, its characteristics are superior to those of foam elements made of XPS. High quality of this material is guaranteed by BASF, which is our sole supplier.





„When building our house, we wanted to wisely invest our money. IZODOM Technology offered by IZODOM has allowed us to complete construction in a short time and we are already seeing the first savings on heating”
Slawek and Magda, Poznań

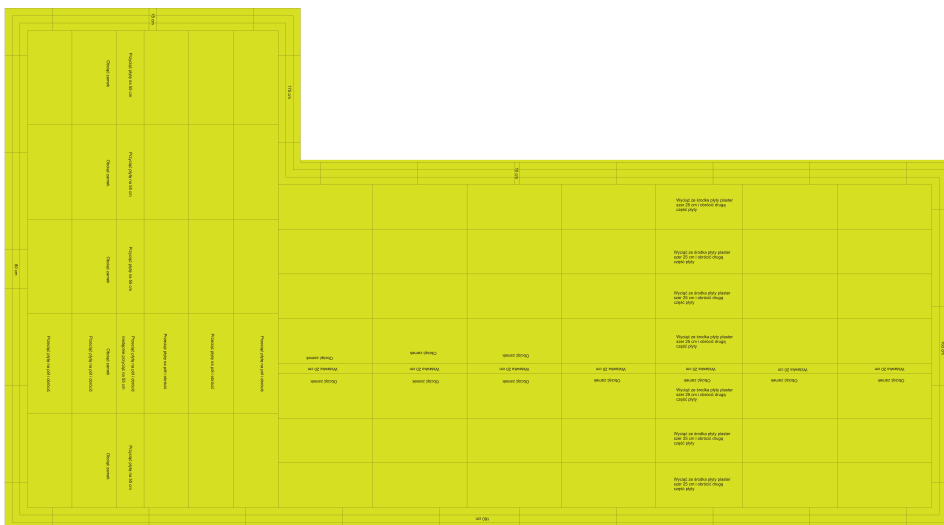
GROUND SLAB DESIGN AND ASSEMBLY

In order for us to prepare an appropriate offer, please send the design documentation regarding your intended building project. At the request of the investor, for a flat-rate price we will prepare a ground slab design. The investor should send us the test results for the soil under the building and provide information about the maximum loads acting on the foundations. The customer will receive a diagram showing the arrangement for laying individual slab elements and the appropriately cut slab elements marked for their alignment by the contractor. In those cases where the slab elements are arranged by our employees, 30% should be added to the price of the purchased items. The cost of this service includes the arrangement of the plastic sheet and slab elements, and transportation. The Investor independently performs the necessary earthworks and filter layer.

What do you need so that we can build you a slab?

Ground tests, determining the depth at which ground water lies, the figures concerning the maximum force acting on the slab, the construction design and the site management project with the location of the building on the plot.

When you order elements from us, prior to delivery we will cut them to the appropriate size, and include a technical drawing showing how to assemble them professionally. Advantages: you build neatly, accurately, permanently, and save time, without generating waste on site, and avoiding thermal bridges.



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