

Attachment 1 to guide the investor Frequent Asked Questions

SIELANKA®



Index.....	Błąd! Nie zdefiniowano zakładki.
1. Log house or brick - what are the differences in price?	2
2. What affects the final price of the shell closed home?	2
3. Why is the price difference between the one-story house and the house of the usable attic?.....	3
4. Where we can and where is not worth to spare on building a log home?	4
5. How long does the process of building a house of logs?	5
6. What is the best wood to build houses?	5
7. Why dry logs?	6
8. Log thickness and warmth of home	7
9. How warm wooden walls	8
10. How to conserve the wooden houses.....	10
11. What are the types of impregnation?	11
12. Does such a house may eat beetles or other insects?.....	12
13. How to avoid, fungi in wood construction?	13
14. Is this house is flammable?	13
15. What is the sustainability of such houses?.....	14
16. How in log houses mounted electrics?.....	14
17. How and when to finish the house?.....	14
18. Floor heating, floor screed, is the ceiling stand all this?.....	15

1. Log house or brick - what are the differences in price?

Closed-in house of logs, assuming the same parameters of the object is slightly more expensive than a brick. This difference calls for finishing building, ranging from insulation, plastering and finishing the painting. Wood is very good "insulator," having "heat buffer", as we wrote in an investor guide. In addition, the electrostatic properties make the house dust does not float. Wood color calm and mute, help fight stress. House of logs to the touch is much more pleasant than brick, concrete or plaster. In addition, we are surrounded by natural material, in contrast to such blocks, which are often an essential component of plant waste, ash.

2. What affects the final price of the shell closed home?

The final price of the shell closed influence of many factors. The most important are:

- The thickness of the outer walls were afraid,
- Outline the main walls of the house,
- The complexity of the roof structure,
- Number of floors house
- The type of roofing.

The thickness of logs

On average, the difference in the cost of building a house of logs with a width of 25cm and width of 18cm is 20 000 PLN. Between 18cm and 22cm log, this difference is relatively smaller.

Outline of the main walls

Rectangular or square block of the house is the cheapest to make. In the case when the project includes indentation, tabs, patios or porches affect the complexity and thus the final price of the house.

The complexity of the roof structure

The cheapest solution is to pitched roof. The roof envelope or mansard more work includes carpenters, of course, which affects the final price.

Additional costs in the roof structure are:

- Balconies,
- Bay windows,

- Dormers,
- Buffalo-dormers with eyes,
- Different types of roof collapse.

Number of floors house

The cost of implementing m² storey house will be much higher than the price of building a house story. This is due to the fact that to do storey house with the same floor space as needed storey house much more solid logs, the largest cost of the investment (more on this in another question # 3).

Roofing type

On the market there are a large variety of roofing materials. Prices for the ordinary steel roofing tile start at about 20 zloty per m² to about 50-70 zloty per m² for steel roofing tile with granite aggregate imitating wooden shingle. When choosing roofing should find out about the cost of the roof trim (ridge, wind, belts up on the gutters), which often are not low cost m² roof is not included in the price quoted by manufacturers.

In summary, looking for cheap and simple home decide on the optimum thickness of the logs.

3. Why is the price difference between the one-story house and the house of the usable attic?

For example, to select two projects on the basis of almost identical:

- Draft Bolestawice 7 <http://www.dom-projekt.pl/projekt-domu-275.html> . 83 m² living area, the size of the building at the base of 12.9 m x 9.2 m
- Draft Bolestawice wooden <http://www.dom-projekt.pl/projekt-domu-26.html> . 155 m² living area, the size of the building at the base of 12.6 m x 9.3 m

The cost of construction of the shell open first project is about: 155 000 PLN net, and the second is the cost of 164 000 PLN. Choosing storey project gain almost twice more expensive house 9 000 PLN.

This correlation results from the fact that, in both the so-called draft. well of the house (the exterior walls to the level of the first floor) is almost identical. Area and construction of the roof of both buildings is the same. The difference in the price of raw open mainly due to higher wall elbow (outer wall of logs above the floor) and the upper gable.

4. Where we can and where is not worth to spare on building a log home?

Already at the design stage should seek advice on what to look for in order not to generate unnecessary costs. Each designer can move the vision of our house on paper, but not everyone has experienced the creation of a log home. A common practice of less experienced architects' to design these objects with plenty of cross-beams, and the use of more expensive roof performed.

Below we expose for your factors that influence on the price of a log home, and explain which elements should be avoided, or which can not be missed:

- The origin of wood;

Note the origin of the wood. There are many companies on the Polish market offering log home built from cheap wood, for example, in Ukraine. The soil in this country is quite rich which means that the tree is growing too fast and does not meet Polish / European standards for construction material.

- Appropriate mergers, tightness;

To get a good home for maximum insulation performance we recommend to pay attention to methods of switching logs. Most were afraid to combine obłap and simple locks at the corners (eg dovetail) by us does not guarantee a proper tightness of the structure. Switching technology 'two foreign pen "and specially cut locks in the guide describe the investor in the" Benefits insulation log houses - the scientific study. "

- Drying chamber;

The cost of drying logs to build a house reaches 10% -15% of the value of the shell. This is the reason for the cancellation of this procedure for many companies. Not dried wood settles down to 18cm, breaking much stronger than dried. Furthermore, drying chamber kills spores of microorganisms. More on this topic we describe in the section "Why dry logs?"

- The use of logs from trees quarters;

Solid log to build a house should be trimmed from a tree that is the core and should have known. tough guy in his central point. This results in the fact that the house is in a controlled manner, a rupture of wood are always in the direction of the core. For example, the implementation of 4 smaller logs from one tree core will have on its outskirts. So if any of his work, cracking will always be greater than the white (softer parts of the tree) than from the core / hardcore. The walls of this house can be more warp and crack in a less controlled manner.

- Width of the logs, exterior walls 18cm, 22cm, 25cm

Recommended are the first two logs to the width of the outer walls 18 (for walls with insulation on the inside) and 22cm (for walls with no insulation on the inside). Larger width of the treatment mainly aimed at adding visual qualities of the whole construction which significantly increases the cost of the investment.

- The complexity of the design and use of attic space;

In order to achieve optimal cost of building a house, select a rectangular structure on the basis of no additional bends, indentations or projections. In addition, the project always with attic will be cheaper to manufacture than one floor at the same floor space. Explain this issue in detail in the section "What is the reason for the price difference between the one-story house and the house of the" utilitarian "attic?"

- Construction of the roof;

The most financially optimal performance will be based gable roof rafters for floor beams, roof, gable characterized by a relatively low cost of building in relation to the resulting usable). In addition, this design is more resistant to strong winds creating a closed block in the shape of a triangle. Rafters are supported by small columns forming the so-called. wall elbow - backbone.

5. How long does the process of building a house of logs?

Order realization time depends on many aspects, however, this process usually takes 3-4 months to reach the shell closed. In the first month of the timber is ordered, than selected and transported to the dryer. The drying process, wood processing (logs to make ready for construction) and bringing the investor into the following month. Last 30 days is a fitting home for the foundation. With efficient coordination of individual construction crews finish turnkey home should take 6-7 months.

6. What is the best wood to build houses?

To build the house should be used pine wood. These recommendations are mainly due to the availability of this tree in Poland and the properties of pine and hence investment costs. It has a high content of grain because of the substrate on which the growing (and dry sand), which makes it tough, elastic, relatively soft and easy to handle. Much more difficult are treated spruce, because it has less elasticity and less durable. Wood should be planed four sides, which gives greater resistance to fire, which slides

over a smooth surface. Furthermore planed wood has greater resistance to insect activity. Wood can't be specified in the standards of defects, such as knots or cracks patients because they reduce its strength. It is best when it is dried Kiln (which once more the microwave). This method reduces the occurrence of mold spores, fungi, insect larvae and minimizes the process of blue stain wood.

Humidity pine, from which you can build a house, it should be:

- not more than 18% - if the items are enclosed,
- not more than 23% - if the items are in the open air.

7. Why dry logs?

Many companies in Poland because of high costs and lack of appropriate conditions, to produce elements of the house, is not drying wood. House made of not dried material settles in the first year up to 15 cm which prevents the further steps of finishing the interior.

Slight cracking of the dried solid wood is a natural phenomenon and does not affect the weakening of the structure of the building. Experience shows that wood to build a house should be 18% - 23% humidity. Such wood is not exposed to distortions arising from the rendering or receiving of excessive humidity. You could say that the house standing in 10 years fitting into the weather just has the humidity.

- Freshly cut wood from the tree (with a moisture content above 30%) is about 60-75% less than the bending strength of dried wood (with a moisture content below 18%). Load house components made of not dry wood is therefore much smaller.
- Wooden construction elements dries, shrink and twist. It reaches a stable size only when it reaches the proper humidity.
- Moisture from the drying wood penetrates the layer of mineral wool, compensating for its insulating properties.

Wood without being able to quickly dry out is brewing and is prone to blue stain. They can grow on it molds and fungi being detrimental to the household. This destroyed the wooden structure of the building threatens the safety of occupants.

8. Log thickness and warmth of home

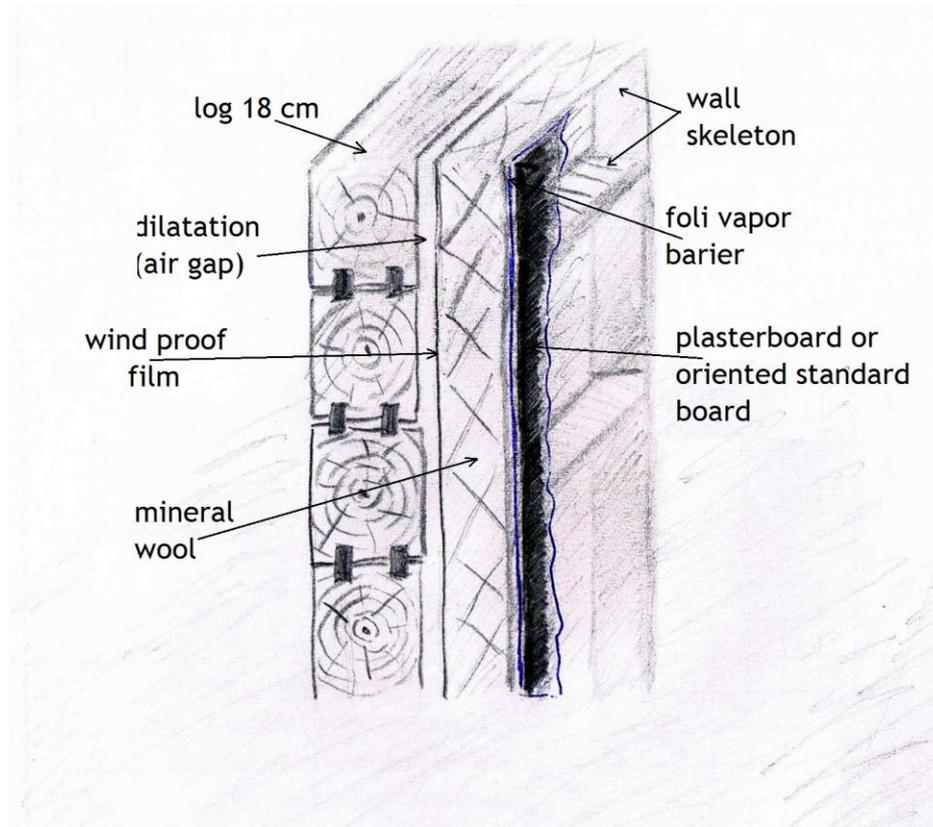
According to Polish standards heat permeability of the walls themselves should be afraid W/m^2K (watt per square meter and Kelvin) 0.50 and 0.30 for insulated W/m^2K . This means that for the first solution, the log should have a thickness of 30cm. These standards, however, does not take into account the important characteristics of wood - heat accumulation. It turns out that when calculating the heat balance of the building has 20cm thick logs meets our expectations. This follows from the practice. It happens that many builders in Poland has no worming 18cm logs. With our long experience, we advise our clients to:

- log with a thickness of 18 cm warm by illustrations presented in the next step, preferably using a polyurethane foam, open-cell (a description of this solution is also the next question). This way of building insulation significantly reduces the visible amount of wood inside the house,
- log with a thickness of 22 cm and more does not require additional insulation, is dedicated to investors who wish to enjoy the natural look of the internal walls of the log.

The use of technology log connections of "two alien pen" and specially shaped locks in the corners of the structure (illustrations in this guide) allows for very high integrity of the house. This is the most important factor that determines that the house is energy efficient.

9. How warm wooden walls

The diagram shows the wooden walls warming illustration:



Source: Own work SIELANKA®

Warming in the homes of logs, we recommend the logs with a thickness of 16-18 cm. Using a 22cm wide by us there is no such necessity. Isolation from the inside in this order:

- dilatation, 2cm gap that allows drainage of excess moisture,
- windproof film,
- 10cm mineral wool,
- foil vapor barrier,
- plasterboard or OSB.

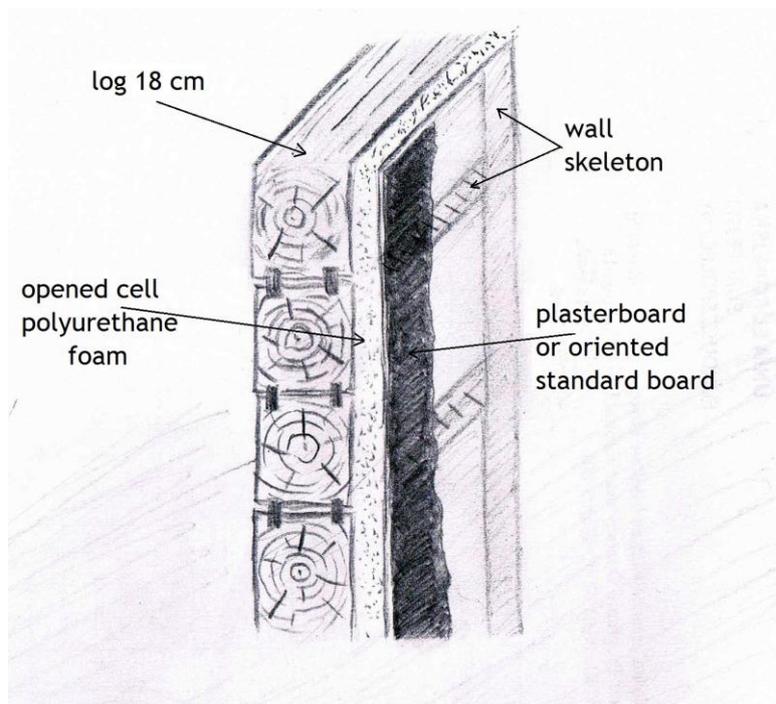
An interesting solution is to replace wool cellulose. The most important features of cellulose include:

- The material is safe for health, does not cause allergies,
- Very good thermal insulation properties, due to its spongy structure and a large amount of air - about 70-80% by volume. This gives a similar performance heat transfer

coefficient for mineral wool,

- Steam-permeable, requires no vapor barrier, thus has the ability to absorb water and putting the environment. At home we gain so-called “breathable walls”, and therefore not “sticking” of the same qualities that have wood,
- A good acoustic insulator, protecting us from unwanted sounds,
- Structure, thanks to shower application continuity of this material is obtained by eliminating the heat loss insulation (thermal bridges) arising from the use of other insulating materials,
- Resistant to pests and fungi, which means that it is a durable material,
- Retardant material, not diffusing fire through impregnation and crystallization of the fibers. In this respect, cellulose is classified as polyurethane foam, except that in case of fire is much more secure, because it does not emit toxic fumes.

Using open-cell foam (polyurethane), this pattern varies quite significantly as shown in the figure below:



Source: Own work SIELANKA®

This solution is relatively new but very profitable, because:

- The application of polyurethane foam is very fast (we recommend spectacular videos on the internet under the banner of the application of polyurethane foam), which saves money on so-called. hours of labor - labor,
- Very carefully sealing the structure in areas of application areas, reaches hard to reach

areas (applied in liquid form grows and solidifies as a homogeneous mass without joints and gaps), yielding high energy savings,

- Protects against dust and dirt, as well as the material itself does not emit dust, in contrast to mineral wool,
- Mass based on renewable raw materials inert to human health (lack of carcinogenic and allergenic compounds),
- Significantly reduces noise due to trapped air bubbles providing a quiet and pleasant warmth of the house,
- Has a very low coefficient of thermal conductivity which allows for significant reduction in thickness warming. This relieves the structure and gives more space inside the building (it takes about half the space than mineral wool),
- Polyurethane foam improves the rigidity of the structure of applied areas such as the roof before the onslaught of snow.

There are two types of polyurethane foam, open-cell and closed-cell. Both have similar features but the latter does not let water and moisture and is more rigid. With wood construction use open-cell foam because of its steam-permeability. This solution allows the elements of wood to breathe.

Closed-cell polyurethane can be used for example for floors (ground floor, where it is the foundation) so the heat from the under floor heating will not escape into the basement.

10. How to conserve the wooden houses

Before installation, each element of the building process should be protective material, which is usually decomposed into two stages:

First

Shower or bath by subjecting the wood elements acting on the basis of preparation of colorless salts or its derivatives. The first layer protects against mildew, germs and repeatedly raises the temperature of ignition. It is important that such an operation preparation has been done before submitting a house.

Second

After placing the shell it is recommended to be building a second degree of impregnation. On the outside we use measures of a strong protective effect against the elevation of atmospheric factors: UV, rain, dirt and excessive moisture, microbes and blue stain. The impregnate should have pigment (color), because it is the only true protection against UV rays, which cause "color fade" south-west wall.

Inside your home water use preparations, safe (neutral) organic to human health. Well-protected house from the outside and inside maintenance from 3 to 7 years depending on the quality of the preparation was applied for the first time. Maintaining this position is to brush a colorless film preparation. This action will renew the protective coating, will extract the original intensity of color and requires no special skills. It should be noted that the maintenance of the house with wood is incomparably cheaper than the maintenance of a brick house.

Important information:

Preserved wood should not be more like 28% humidity. Moreover, it should be clean, without residual bark, rotten places or places with blue stain. Impregnation process itself is carried out during dry weather.

11. What are the types of impregnation?

There are two types of wood preservatives:

Surface: saturation of wood from the outside by painting them or spray, the effect on depth of 3-10mm,

Plunge: by saturation impregnation by immersion or vacuum - pressure (greater effectiveness and durability by burrowing deeper into the wood structure), the action at a depth of more than 10mm.

We protect wood against moisture, sun, fungi and insects, apply here various types of impregnation and oils to the wood. In order to give color, we recommend the use of transparent varnish that means not overlapping structure of wood. It is important that the preparation affixed to the wood, allow it to breathe. "Covered" wood is not able to dissipate the excess moisture on the outside, its life is shortened. In addition, disappears under the paint his natural charm. An interesting solution measures are mixed with wax. They form a waterproof, noble-looking coating that enhances the beauty of wood and smooth's them.

We can distinguish five groups of wood:

Impregnation. Prevents growth of fungi and insects, some further contain substances kill insects and eliminating outbreaks of inflammation.

Application: the raw wood.

Impregnation coloring. In addition to the ordinary sponges, also contain pigments that absorb UV

rays and also protects the wood from graying. They are transparent, color the wood, but leave a visible image grain.

Application: raw or already impregnated wood.

Varnish. They create a strong, transparent shell, protecting the wood from moisture, and with pigments - also from harmful UV rays. With the addition of varnish to protect against diseases and pests can be used as the sole protection of the wood.

Mordant - Varnish. They form a strong coating (with or without color) protects the wood from moisture. Some contain filters for protection against the harmful effects of UV rays.

Application: only to lighten already colored wood.

Oils. On the basis of vegetable oil, protect wood from excessive moisture absorption, reduce drying and cracking wood. Protect against UV rays, refreshing color.

Application: wood impregnated and / or painted. (Use oils only need to repeat applications every year in the spring).

Here are a few solutions to complex impregnation house:

- ♣ protection (base) against fungi and insects Boramon C30 or Penetrin Altax company, and as a hedge properly with the color Altax impregnation for wood,
- ♣ protection (base) against fungi and insects boramon C30 or company Penetrin Altax well as adequate protection, with emphasis on wood structure Altax Wax,
- ♣ protection (base) against fungi and insects boramon C30 or Penetrin Altax company and as a competent security Altax Oil for wood,
- ♣ protection (base) against fungi and insects Valtti Base New Company Tikkurila and Tikkurila Valitti Color Company,
- ♣ protection (base) against fungi and insects Valtti Base's New Complete Valitti Tikkurila and Tikkurila company,
- ♣ protection (base) against fungi and insects Sadolin Base and as a hedge properly with the color of Sadolin Classic HP,
- ♣ protection (base) against fungi and insects Sadolin Base and as a hedge properly with the color of Sadolin resistant varnish.

12. Does such a house may eat beetles or other insects?

Once protect wood from pests are making the resin which was cured by natural protection. Today we have a whole range of different preparations Geneva Convention

on Refugees in the structure of the wood and protecting them against pests, blue stain, mold, fungus, etc., offered by many manufacturers. The material of the house often is subjected to impregnation in a sawmill (pressure or bath), and again after placing the building. The quality of the preparation often goes hand in hand with the price, but the technology is developing in the right direction. Manufacturers offer preparations of natural ingredients created harmless to humans, and effectively protect against destruction of the wood. If the structures so impregnated could survive for hundreds of years is much less well preserved by means of which were used to produce the modern research and technology.

13. How to avoid, fungi in wood construction?

As already mentioned, wood for building homes should have adequate moisture. Reduces drying of microbial growth in the log. In addition, the wood should proceed in two stages of impregnation (during treatment and after placing the structure) as well as wrote. Additionally, use of materials, "breathable" in the immediate vicinity of the logs, and breaks the air (called dilation) provides very good protection against microorganisms.

14. Is this house is flammable?

All the time there is a conviction amongst people that the house of wood is highly flammable. This is due to old notions of rural huts covered with straw, which in dry weather the years it was easy to ignite. Today the case of wooden buildings look different. Properly constructed house should be soaked ignition delaying means (for example thatch, after an appropriate impregnation is not combustible). Such preparations are also protects the wood roof truss in the homes of brick. It is also important that the wooden buildings perform well and protect the electrical system.

To deliberately set fire to a house with wood should perform similar steps as for calling fire in a brick house. Brick houses usually have wooden roof structure and often EPS insulation of the building. This means that contrary to appearances, are not more resistant to fire than wooden houses. If the house is warmed with wood from the inside, this is an additional safeguard in the form of fire-resistant layer plates consisting of

plasterboard and mineral wool. It should be emphasized that the statistics do not show more fire in wooden houses than in buildings made of other technology! So the claim that the houses made of wood are flammable is wrong.

15. What is the sustainability of such houses?

The most valuable monument in Poland, commanding the durability of wooden buildings is Biskupin according to research dating from 738 BC and discovered in 1933. This settlement is a confirmation of how durable the material can be wood. Thousands of wooden buildings is in Poland for several hundred years, among which particular object is the Church of Peace in Swidnica (1657 year).

It is worth mentioning that today's technology to build houses of wood is much more advanced than the technique used for example in the above-mentioned objects. In addition, the durability of wood depends mainly of care about them. Correctly operated last for many generations.

16. How in log houses mounted electric?

Basically there is no significant difference between the electrical installation in the homes of brick and that the log houses. In the case when the investor uses thick logs and no warmer inside the walls it is best to put black, fire-tube vertically in the logs, drilling them at the stage of assembling the walls. The second option, less aesthetic, is the electrical installation in ducts or metal shields mount it directly to the wood (found in old houses). If you use thinner logs and warmer house from the inside then the case looks almost identical to the brick technology. Cables are concealed in the construction of the wall, in this case, the skeletons of wooden walls, which are filled with insulation and covered by plasterboard panel or OSB. Regardless of the thickness of the logs we can hide the wires in partition walls and ceiling.

17. How and when to finish the house?

Dried log home, we can finish almost immediately after placing the structure. In the case of wet wood building may settle even a few more seasons depending on the level of humidity. Finishing it immediately after made the construction is associated with numerous cracks in the solid elements (connecting walls, windows and doors, etc.) or untightening. Mounting "rigidly" windows and doors, it can lead to significant damage as a result of pushing wrap construction.

We recommend building a dried log homes. Then of course the house subsidence phenomenon occurs, however minimally. Place inside the walls associated with the use of special movable wall with log joints, the case looks the same at the installation of windows and doors. This technique allows to avoid any irregularities in the functioning of the house.

18. Floor heating, floor screed, is the ceiling stand all this?

In fact, the entire underflow or heating, screed and floor warming weigh about 100 kg per m². What in the average size of a house, on the ceiling, gives us 5-7 tons. If the investor decides to apply this type of heating has to decide this at the design stage house. This will take account of relevant changes in the planning capacity of the structure.