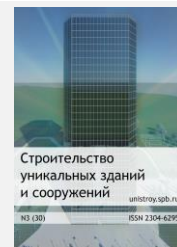


Construction of Unique Buildings and Structures



journal homepage: www.unistroy.spb.ru



Benefits of houses from round logs

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ARTICLE INFO

Analytical review

Article history

Received 13 November 2015
Accepted 11 March 2015

Key words

logs,
vacation home,
ecology,
pine,
dignity

ABSTRACT

Modern construction is actively developing. Therefore, it becomes difficult for many people to "breathe" in cramped conditions and they leave the countryside to live in private homes. The article touched on the actual topic of the moment - the construction of houses made of logs. Fans of ancient Russian traditions should certainly give preference to homes made of logs. It is this kind of wooden building reminds us of the traditional wooden cabins, which from time immemorial our ancestors lived. And it gives the houses made of logs unique flavor reflects genuine Russian spirit and creates a wonderful atmosphere of unity with nature. Round logs undergoes minimal processing, providing high ecological this building material. Also reduces installation time and improves the quality of home construction. Authors tasked with identifying benefits calibrated timber in the construction of buildings.

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1. Introduction

Nowadays more and more people began to prefer living in the country in wooden houses, away from the bustle of the city and heavy urban air most popular houses of wood construction in the country caused by their environmental performance and a number of advantages over the various building materials. Wood will always be a popular material because of its decorative properties. Wooden house – are environmentally friendly house. Wood has the ability to "breathe", and it has a positive effect on human health. This house does not need air conditioning; wood itself controls the humidity and temperature in the house.

The most valuable material for the construction of a wooden house is considered to round logs, as after processing special equipment it acquires equal diameter throughout its length. The main advantage of logs is that this material allows almost completely reduced hands work to "zero." Round logs - an excellent building material for building a country house. Construction with logs will always please the owners for their beauty, coziness, warmth, comfort.

2. Literature review

Analysis of literature shows that building of wooden houses is really popular. The house made of logs is simple to manufacture and is not inferior in strength brick house or house of foam blocks [1, 3, 10, 12, 16]. Such a structure with proper treatment will last for many years. Wood is the most available and ecological material in our country. Also advantage of round log is that it can be used for building big span construction with uniform shrink range of wood [13, 14, 35]. Techno-economic indicators show that building country-side house from round log is cheaper than from concrete constructions [13]. Also costs on heating could be reduced because wooden house keeps warm in winter very well and brief in summer [13].

3. The main task

The main aim of that article is to analyze living of man in houses that built from round log. So there are main objectives:

- 1) to analysis literature to find useful properties of round log;
- 2) to determine advantages of using round log in building process;
- 3) to learn required methods of log treatment before using and after using it in building.

4. Round log for building houses

Trunk of tree stretches from land to the sun. That's why diameter at the bottom of the tree is bigger, then at the top of it. When builders logging wood for building they select and customize logs to each other. This work is hard, that's why building of round log house is expensive. But technological progress of building helps to reduce costs and optimize all process of logging for building. Modern house of round log is result of this progress.

House from round log is like assembled designer. Each part of it is made exactly; all elements perfectly dock with each other. That perfect details make on special machine. It gives perfectly round shape to each log. This is due to wood's wet.

In Industrial scale of building wooden houses the most popular material for making walls is round log with crescent-shape (shrink) groove. By this groove round log will locate exactly. To prevent cracks in wood the compensation groove (discharge seam) creates at the bottom of log. It removes internal stress of wood.

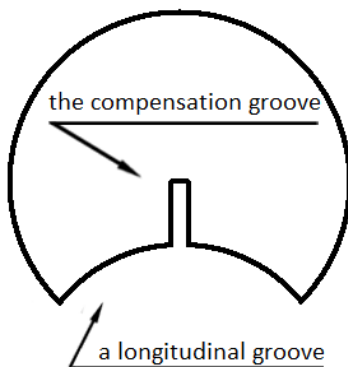


Figure 1. Shrink and compensation grooves of round log presented

In spite of all this measures there could emerge some cracks in a log. This is so wood is natural material. It's necessary to harvest timber properly, to reduce chance of appearance of these injuries.

There are shrink and compensation grooves of round log shown on figure 1.

5. Log treatment process

Round logs are made by removing the loose part of the trunk of the tree, while experts try to keep the outer part of the log, which is called the sapwood, because it is very strong and has a maximum resistance to rot. It should also be noted that central portion (core) should remain in the center and after the process of cylindering of wood logs.

Technological process starts with sorting the logs by diameter (18, 20...28 cm). Then it is fed to the machine tools, in order to achieve the same diameter and cut grooves.

Further processed logs is sent to the power cutter, where they prepare for a given length, and then sent for slicing "cups" and labeling each log on the project. At the final stage of each round logs covered with a special chemical impregnation that protects from external negative factors.

The current impregnation for wood act very carefully, they do not cover the capillaries of the log, which gives him the opportunity to dry in a natural way in the construction of states and not to succumb to fungal diseases. After the log has dried, it covered again in a different kind of impregnation to protect it from rot and pests.

Upon completion of this process, to impart a smooth surface of the log, it polished and impregnated with varnish right inside the house. As a result, after such processing round logs less than other wooden material is subjected to cracking which occurs during the drying buildings, and even if cracks appear, their depth is smaller.

Round logs have many other advantages except technology. Very smooth and even the logs that fit tight, have quite a nice view. There is no need in additional processing to give an elegant appearance.

Round logs of pine is shown in Figure 2.



Figure 2. Round logs of pine

6. Logging for construction

The blank material for the future cottage - it is the first and one of the most important moments in the entire building. From the correctness of timber depends how it would be processed, its correct uniform shrinkage of house and most importantly - the life of the entire wooden house.

Pine is used as a raw material for the construction.

The ideal timber for house construction is North. This is due to the fact that in the northern areas of tree growth is slower than in the south, and, accordingly, the northern wood denser. As for the time of year, it is best to harvest timber in the winter, because at that time it is the driest. Also in winter

the very structure of the tree shrinks and becomes denser. Material that has been harvested in winter very well handled and has high resistance to cracks and other damage.

7. Advantages and disadvantages of a house built from logs

Advantages

1. Ecological

Tree - absolutely harmless material for both humans and the environment. Therefore house made of logs is environmentally friendly: it does not pollute the environment, maintain a comfortable microclimate inside, disinfects the air by means of volatile production, prevents the growth of bacteria and viruses, as well as a house helps to improve mood and well-being of people who are in it because of the essential oils secreted wood.

2. Thermal conductivity and sound insulation properties

Wood has low thermal conductivity and good sound insulating properties that provide comfortable accommodation in a house made of logs.

a) Low thermal conductivity of wood is a big plus. In the winter, the building retains heat, allowing you to build a structure with a small thickness of bearing walls, as well as allow reducing heating costs. In the summer, the house is heated slowly, which promotes comfort conditions to stay in it. The air in a house is always fresh, even with the windows closed.

b) Acoustic properties of wood in the house improved because of features rounded logs and technologies to minimize the gaps between the logs in the process of laying.

3. Easy to construct

Another advantage is the simplicity of the assembly process, as well as light weight material with the construction of houses made of logs.

a) Light weight allows you to build a house on soft ground sites and save on the foundation.

b) Due to the simplicity of assembly is greatly reduced duration construction of the house, as well as possible the construction without involving of professional builders, but it must be strict adherence to construction technology. If you need to transport the structure, it can be dismantled and transported to a new location.

The construction of a dwelling house of logs is shown in Figure 3.

4. Appearance

Cylindrical logs are the same size, smooth surface, and have the natural beauty of wood. That makes house from them an attractive outside and cozy inside, and also allows you to save on the external and internal decorating.

5. Economy

Based on the above advantages, it can be concluded about the cost of the house. Despite the expensive material, the house made of logs allows you to save on heating and air conditioning on no need for decorating, to the foundation, as well as save on construction of house because of the simplicity of its construction.



Figure 3. The construction of a dwelling house of logs

Disadvantages

1. The shrinkage

Susceptibility to shrink - one of the disadvantages of a house that built from logs. The shrinkage depends on the type of processing logs and varies from 3 to 7%.

After assembling the necessary conservation home construction for 6 months.

2. Caulking of joints

After shrinking home walls require Caulking of joints. This is necessary so that the wind did not fall into the gaps between the logs, and the heat does not leave the house. Also in the gaps can be formed wet, which may further lead to rot and fracture walls.

3. Cracks

When using materials of natural moisture, formed cracks. If you observe the technique of construction in all its phases can minimize the formation of cracks.

8. Main mistakes in constructing of round log house



Figure 4. Construction of log house without dowel

Build a log house without dowel

Logs tend strongly deformed on twisting during drying. If in assembly were not used dowels wooden log walls can be curved hump.

Build a log house without dowel is shown in Figure 4.

Insufficient depth hole drilling for dowel

If the dowels were used, each of them must drown 2-3 cm in dowel hole. The fact is that the drying timber log decreases in diameter, and non-recessed dowel "will be extruded" of logs, overlying log will hang on it, and formed a gap. For the same reason it is impossible to collect log-on nails.

Arrangement of jamb

Jamb reinforces door and window openings, and do not interfering with the shrinkage home. If you install to a freshly assembled log house the door or window frame without jamb, shrinkage carcass will lead to their deformation.

Premature installation of windows and doors

Log house after construction must stand without doors and windows and have a good airing. Walking wind in the house ensures drying the logs without the appearance of fungus. Cases when the builders offer conversely to close log house by film (from rain), which leads to unsatisfactory results.

9. The main mistakes in the device of roofing system:

Log house cannot be left without a roof, or wood instantly darken and it will mold

Complicated roof to clean sweep at once

If roofing project is not simple gable and complicated it should not be covered the finishing material immediately. The fact is that during the drying process log and ridge wall shrink unevenly. Therefore, in the case of a complex roof it's difficult to provide all compensating elements. So after the construction of log house sets a temporary roof of roofing material, and only a couple of years later mounts a permanent.

Inadequate roof overhang

Overhangs protect the walls of the house from driving rain. The normal overhang of roof is 70-100 cm (length rafters). Small overhangs provide rapid flushing of antiseptic from the walls, as a result walls darken.

Mounting of the roof without moving elements

Gable roof is quite permissible to make a clean sweep at once, but you need to provide a non-uniform shrinkage of the ridge and the walls (vertical shrinkage ridge always more). Therefore, the fixing of the rafters to the walls make only on the sliding elements. Also construction of rafters in the field of ridge should allow them to little "disperse" after shrinkage.

Attaching the rafters to gable

Unacceptable mount rafters to gable. Rafters in the process of the shrinkage of log house change the geometry. And if they are nailed to gable, the gaps can be formed in the wall also it may break rafter system.

Attaching the rafters is shown in Figure 5.



Figure 5. Attaching the rafters

10. Conclusions

Dwelling house of logs - is environmentally friendly type habitation for human, has a particularly beautiful view of the outside and inside, without requiring additional costs for finishing; there is a special microclimate in such house which has a positive effect on the psycho-emotional state of a person;

This type of house is pre-fabricated, and low-cost;

For longevity and quality of construction of the house made of logs, you need to pay particular attention to the special rules of its construction, preparation of wood, and further processing of the wood after construction; In Russia, many people need their accommodation, in this regard, building your own home, including from wood, is of particular relevance nowadays.

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Преимущества домов из оцилиндрованного бревна

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Информация о статье	История	Ключевые слова
УДК 69 Аналитический обзор	Подана в редакцию 13 ноября 2014 Принята 11 марта 2015	оцилиндрованное бревно, загородный дом, экологичность, сосна, достоинства

АННОТАЦИЯ

В настоящее время активно развивается загородное строительство частных домов из дерева. В статье затрагивается актуальная на сегодняшний день тема – строительство домов из оцилиндрованного бревна. Оцилиндрованное бревно подвергается минимальной обработке, что обеспечивает высокую экологичность этого строительного материала. Также сокращается время монтажа дома и повышается качество строительства. Авторами поставлена задача определения преимуществ калиброванного бревна в процессе возведения зданий.

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