

NEW TRENDS OF ACHIEVEMENT OF ECOLOGICAL LIGHTWEIGHT WOODEN MATERIAL

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Abstract

The dominant trend both abroad and in our country is phasing out heavy concrete and replace them with alternative building materials that meet tenants health and the environment. Thus arose "green homes" made with organic materials, among which the most important is wood. One such alternative material consists of chipboard with cement or concrete. Material, in the form of plates or bricks, has a configuration of several layers, with the sides of the wood fibers bonded with cement, concrete and polystyrene core. The wood used to build green houses, as we know, is the oldest material used in construction, being used both as a structural element in exterior walls, interior walls, roofs, floors, woodwork items, or integral structure as well as the furniture and decorations. In general, the construction works carried out in our country use resinous wood (fir, spruce) or oak. This has extended to our country, the trend of completion of houses in natural materials, environmentally friendly and execution price that is lower.

Key words: elasticity, ecological construction, joints, wood

introduction

Woody materials ensures a high level of thermal and acoustic insulation, in addition, the wall breathe, allowing movement of vapor from inside to outside. Wood tiles are fireproof and very durable, lightweight and economical.

Installation is easy and fast, can be used for any walls, ceiling, dormers, facades, with very good mechanical strength and physical. It can render any kind of plaster. It provides a high speed execution and a healthy home. Costs are quite beneficial to other building material [3].

Other alternative materials may be mentioned in drywall systems which consist of a metallic structure made of horizontal and vertical profiles as support and plates composed of a layer of gypsum quarry rehydrated resistant and very sticky, embedded between two sheets of special carton closing down structure yielding perfectly smooth surfaces.

Support and wooden plates constitute a constructive internal partitioning, such as interior walls, wall cladding and ceiling [2].

This system can be used for various architectures. By modifying elements such as type and number of plates, thickness and size of the steel structure etc. can be obtained various technical and constructive solutions tailored ethnic project of a house.

Green houses are usually constructed from massive logs or profiled, showing interest for their natural appearance and for the short duration of execution and low cost materials.

MATERIALS AND METHODS

In order to achieve an ecological house as expanded implementation of the houses tend lately, we need natural material, environmental, namely wood. The method of execution of these homes is the combination of logs or shaped elements, without the use of nails or metal ties, perfectly consistent with the concept of "home or ecological house". Wood breathes naturally and adjusts the internal climate of the house, stabilizes moisture and acts as a barrier against external noise.

Technology implementation of these houses is

that resistance wooden structure rises above a platform which in turn rests on a pedestal and foundation, which can be of stone and concrete plain or reinforced concrete or natural stone. Inside the house, the structure is partially apparent resistance, closing the ceiling between the beams and finishing interior walls are made of plywood plank beaded, plain or shaped, varnished with clear varnish. The floor can be made of or parquet floors.

Exterior closures can be achieved with boards made of wood. Finish ensures the paints and varnishes. Cladding may also be used with grooved boards or sections of wood logs. Thermal insulation may be used for mineral wool protected towards the inside by a layer of bitumen cardboard, the role of the water vapor barrier.

If these construction timber full light covers are recommended as shingle, and other lightweight materials.

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RESULTS AND DISCUSSIONS

The structure houses built of wood

The components, structural and nonstructural, which run at a wooden house:

Foundation:

a. small houses without basement, wood structure sits directly on a concrete platform (type slab) thickness of 25-30 cm with Bc 10 and mesh reinforcement \emptyset (6-10 / 100) mm. This platform has a layer of gravel to break water by capillary rise [8].

b. houses with one or two levels using continuous foundations laid in the walls of discharge gates on isolated supports (simple concrete block foundation) [4].

c. houses with greater height regime placed on land issues (loess soils, soils susceptible to wetting) using continuous foundations with reinforced concrete block and socket. They will permeate min. 20 cm in good soil foundation and frost depth will exceed 10-20 cm.

d. house with basement - the basement walls and the floor above the basement is made of reinforced concrete. The exterior walls will be insulated with polystyrene, brick, bitumen tar paper (2-3 lines) [3].

Construction is wood frame is an affordable way to build a house and maintain it while ensuring those who live in it, all the requirements of comfort . It also houses built in this system adapts to any architectural style, both traditional and the contemporary.

e. house located in mountain areas - foundation blocks can be made of stone or concrete masonry cicopian.

Base house:

Wood that will fix the base plate using a special mounting system - by cavity or using concrete iron whiskers $\emptyset 6$ mm, caught in the foundation. It serves as the foundation wall mounting and contour tracing role of the house itself. It will sit on a role paperboard with waterproof layer [4].



Fig. 1. House built on wooden structure

Walls

It can perform several types of walls, their composition being made to meet all the resistance of the structure of the house, thermal conditions, and furthermore, the terms of harmonization of the architecture [8].

Depending on the chosen construction system, can achieve a number of variants for walls such as:

System with overlapping beams (with housed - execution of a notch in a piece of wood, in order to join with another piece of wood):



Fig. 2. System with overlapping beams - the interior upright



Fig. 3. System with overlapping beams - without interior upright

The wall panels - they ensure taking vertical loads resulting from the weight of the floors and roof structure and the horizontal loads resulting from seismic wave action and wind action and transmit loads, foundation [5].

a). - outer cladding 22-48 mm

- membrane A330

- Upright (pole)

- mineral wool 100-150 mm

- PVC

- Interior paneling or RG 12.5mm de18mm

b). - exterior cladding 24-48 mm

- Ruler 20 x 40 mm

- OSB board 9-12 mm

- Upright (pole)

- PVC

- Ruler 20 x 40 mm

- RG 12.5mm or interior paneling de18 mm

c). - Plaster 20-40 mm

- plate Heraklith 10 to 20 mm

- membrane A330

- Upright (pole)

- mineral wool 100-150 mm

- PVC

- OSB board or plank 9-12mm 24-30mm

- RG 12.5mm or interior paneling de18 mm

d). - Plaster 20-40 mm

- Adhesive, primer, fiberglass mesh

- polystyrene

- plank 24 to 30 mm

- Upright (pole)

- mineral wool 100-150 mm

- PVC

- OSB board 9-12 mm

- RG 12.5mm or interior paneling de18 mm

e). - Wainscoting - simple patch (mod fastening boards on an outside wall, a roof, etc., so that each plank to plank previous cover a width of 2 cm [10]. - From Turkish Kaplama.) or false 22-42 mm

- Ruler 20 x 40 mm

- membrane A330

- OSB board 9-12 mm

- Upright (pole)

- Rockwool 100-150

- PVC

- RG 12.5mm or interior paneling de18 mm

f). - Siding (Plastic cladding)

- polystyrene 30-50 mm

- membrane A330

- boards 24-30 mm
- Upright (pole)
- mineral wool 100-150 mm
- PVC
- OSB board 9-12 mm
- RG 12.5mm or interior paneling de18 mm

Attaching the panels is done with M12 threaded metal rods and washers, each 3 pieces at each joint.

The floor above the ground floor

- OSB 18 mm or 2 rows of 24 mm board arranged in two directions
- wooden beams (50 x 200-240 mm) away from (350-600 mm), according to the calculation of resistance
- mineral wool 100-150 mm
- PVC
- RG 12.5 mm or 18 mm inner lining

The larger openings in the living room or attic space can be used glulam - laminated beams apparent.

Floors

- PVC
 - concrete screed 20-50 mm
 - Polyethylene film
 - Laminated parquet or parquet wood normal
- PVC
 - 20-50 mm concrete screed
 - sa
- PVC
 - Screed concrete 20-50 mm
 - mosaic

Roof - Type framework

a. framework with rafters [10]

- 50x rafters 150-200 mm 400-600 mm distance acc. Calculation of resistance
- Pliers 50 x 100-150 mm

b. framework on chairs [10]

- 50 x 150-200 mm rafters
- Kings (100-150) x (100-150) mm
- Fried (100-140) x (100-240) mm

c. framework with farms [10]

- Truss - size depending on the strength calculation.

Envelopes can be made of the following materials constructive:

- Bituminous shingles - Bardoline (Tegola)
- Corrugated - Bituwell
- Lindab board, Plannya, Ranilla
- Ceramic tiles

Staircase

- Made of softwood with railing in various forms; with handrail and steps headboard made from hardwood (oak or beech);
- Stairs can have different sizes and shapes according to plan and architecture depending on the willingness of the beneficiary;

Woodwork

- May be of wood, PVC, or aluminum;
- Windows can be made in a traditional classical system with double or laminated wood frames for glazing;
- Optional exterior shutters can be made solid or blind type;
- Interior doors can be made with Fly or glass, and the exterior will be double or simple with one or two openings.

Heating pipes, electrical and plumbing

- Mounted in walls or apparent;
- Types and materials to be used at the discretion of the client;

Advantages of constructions made of wood:

- Price low cost up to 30 -40% less than homes made of masonry or metal
- Reduced execution time - about 20-60 days
- Maximum diversity of interior and exterior decorating with art materials
- Repartitioning possibility cavity wall quick and inexpensively
- Elastic wood construction ensures strength an earthquake of up to 8 on the Richter scale
- Wooden structure is slight compared to the masonry or metal, requiring a simple and execute foundation
- Wood treating solution trivalent retardant, fungicidal and antiseptic protects against fire, decay and insects and fungi.

CONCLUSIONS

Made for a very long time from local materials: earth, natural stone, burnt earth, wood and other plant products, "house" was well connected with the natural environment surrounding. House walls, which were made of heavy materials, massive, covering, which was also thick materials and a significant slope, preventing sharp and abrupt cooling interior air temperature in winter and summer excessive growth.

Architecture today has lost most of its traditional roots to achieve house.

Now architectural lines heading inland radically opposed to those of the past. They used new construction materials such as reinforced concrete, steel, glass, plastics, etc., and such walls and roofing are made from low thickness, light, porous, thermally efficient

Over time man was not worried that his health might be influenced by the house in which he lives. He considered the healthy house, the more so since it was done with more modern technology.

Today we are in the situation we face serious health problems that have arisen because of the latest technologies, which were designed to improve our lives.

Currently we have profiled entirely new synthesis of substances, most of which are derived from coal, oil and gas, synthetic materials that form a world foreign to most of us.

Today our house we do not offer the best living conditions. The more it is newer, the natural materials used in the past have been largely replaced by synthetic materials that can pollute the air, water, soil.

Our house is made of many materials based on synthetic resins which pollute the environment, air and water. She is tight, does not allow changes between indoor and outdoor air. In air it retains a lot of water vapor, which increase the likelihood of condensation and favor the growth of fungi, molds and bacteria and toxic vapors that can reach dangerous concentrations, causing diseases. Materials and energy are wasted. Pollute them, in turn, environmentally harmful effects in the long term.

In this context, when people began to ask questions, appear more pronounced and more frequent new technical concepts, new design solutions and "green homes", "smart homes", made of natural materials, the particularly wood.

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