



**BEE HOUSE
TECHNOLOGY**

ECOLOGICAL HOUSES

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It is for a good reason that the name of this Technology is associated with bees. Bees are always better in clean natural environment, being very susceptible to the smallest environmental pollution.

A beehive itself is in a way a shelter with conditions that are very close to the natural environment. Bee House Technologies are based on the similar approach and offer solutions for healthy living in the ideal home.

INNOVATIONS AND ENVIRONMENTAL CONCERNS

The Bee House Building Technology is an innovative environmentally sustainable technical solution for building houses that are comfortable and healthy to live in. Its main advantage is in the achievement of the energy characteristics of the low-energy or the so-called 'Passive House'. We offer the full range of services from designing and prefabrication to final assembling on the site.

FULLY FLEXIBLE

The Technology is variously adaptable to meet different investors' requirements. Innovative solutions help to reduce construction costs while using top quality materials. Investor may choose whether to live in a low-energy or a passive house. Time for the turnkey construction of a 130 sq. m. two-storeyed family house using the Bee House Technology is estimated, depending on its design, at two to three months for a prototype building or three to four weeks for a standard design building.

With the Bee House Technology the house will always have favourable pleasant environment and good 'roof climate' which is created, among other things, due to the 'breathing' panel walls.

Innovative technical solutions are used already in laying the foundations, which are the basic structures of a future house. These are typically made as a heat insulated floor panel with the integrated low-temperature underfloor heating system. Such floor panel has the built-in pipeline for water drainage or heating system, whereas the top of the panel is made ready to be mounted in place for laying the finishing flooring on it. This safeguards from any potential dampness and mould growth. With such foundations it becomes possible to achieve the coefficient of heat conductivity (the so called thermal conductivity) at $0.17 \text{ W}/(\text{m}\cdot\text{K})$ for low-energy houses and $0.10 \text{ W}/(\text{m}\cdot\text{K})$ for passive houses.

FOUNDATION IS A HEAT STORAGE

Building a house on the integrated foundation panel ensures its excellent coupling with the base, whereas the solid foundation becomes a kind of a 'heat storage'. Having chosen such heating option with the underfloor low-temperature heating system integrated in the foundation panel, the investor will eventually benefit from the equalized heat distribution and high thermal comfort. Time required for the manufacture of such building foundation panel is normally from two to five days depending on its size and shape, and already after seven days from then the construction works may be continued, i.e. the walls may be raised.

If so desired by the investor, any of the conventional solutions may be alternatively used for building both foundation and heating system.

PROMPT IMPLEMENTATION

The use of innovative solutions both in construction and in materials at each construction stage, coupled with the prior detailed development of design documents, result in time and energy savings at each investment stage. The surface construction of the building is also based on the use of natural and environmentally compliant materials. The main load-bearing structure is made of specially designed conceptually innovative wall panels. It is, thus, a kind of a unit construction. By using panels that are maximum 1215 x 600 mm in size, the time is shortened considerably compared to other methods of building construction.

Due to the use of wooden elements and state-of-the-art type of construction panels the construction has excellent stability and massiveness while keeping very good parameters. With such construction techniques the erection of a building with the wall panels resembles the conventional construction process with traditionally used elements, but it is much faster cheaper and easier in comparison with other construction methods. The picture below shows an example of a wall structure and wall panel.

INSTALLATION SYSTEMS

With the Bee House Technology it is possible to choose the installation system tailored to individual expectations of each particular investor. Box-type sandwich wall panels allow also using their surface for making installations or arranging air ducts inside the wall construction.

Fibre-cement siding is weather resistant and at the same time it does not prevent the exchange of the indoor and the ambient air, ensuring natural ventilation of the building.

The facing slabs on the outer and internal walls of the building guarantee enough strength and solidity for

hanging heavy interior finishing or decorating elements. We hang cupboards and household equipment right on the walls without any special mounting systems. Fibre-cement siding is weather resistant and at the same time it does not prevent the exchange of the indoor and the ambient air, ensuring natural ventilation of the building (the walls are 'breathing' comparing favourably with walls in most other types of low-energy houses). Cellulose fibre filling of the wall construction allows to achieve thermal conductivity of $0.14 \text{ W}/(\text{m}\cdot\text{K})$; it is fully environmentally sound and make no vapour and air diffusion obstacles.

STRONG FLOOR STRUCTURE

The floor structure is made of composite materials: cement bonded particle boards, which show very high strength. Also the same heating solution as is used in the foundation, may be installed in the interfloor construction, i.e. there may be the pipe system in the floor structure connected to the heating unit. Warm air or liquid will then be circulating in the closed circuit in the floor slab panel.

The use of the prefabricated wooden roof advantageously shortens total construction time, and timber-framed construction offers wide scope for trendy interior designs. However, it is also possible to use a conventional roof construction with any type of finishing.

ŚĆONSTRUCTION SUBSIDIES

The Bee House Technology is well in line with the construction development concept promulgated by many government institutions and European Union. Environmentally sustainable construction, which is based mainly on renewable energy solutions, is in agreement with the vision of the future, targeted in the strategic projects of the European Union and the Government. This opens the way to many co-financed projects both under the already implemented programs and those that are at the stage of the introduction of new technologies. Low-energy technologies help to meet the criteria required for grants and subsidies, including those provided by the National Fund for Environmental Protection and Water Management. It also gains in importance in view of the Government projects presupposing that beginning from 2020 no permits will be given for the construction of buildings heated with solid fuels.