

WOODSTOCK: A UNIQUE BUILDING THAT DEMONSTRATES ADVANCED CLIMATE PROTECTION USING THE CZECH NOVATOP CONSTRUCTION SYSTEM

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Summary

Whilst the Woodstock rock festival in the summer of 1969 can be seen as a protest against conservative values and unreasonable social conflicts, so the namesake from Basel, Switzerland can be seen as a demonstration and commitment to climate protection and the use of renewable resources. A Czech manufacturer, NOVATOP, has created large-scale panels made from massive wood and has participated in the construction of a building which is unique and sophisticated in both its architecture and the materials and technology used to construct it.

Keywords: wooden buildings, climate protection, renewable resources, self-sufficient and environmentally acceptable buildings, construction system from wood

1 Klima(A)rchitektur & Building of the massive wood

1.1 Economical and sustainable building which utilises and maximises renewable sources of energy

The three-storey building, with an unusual ground floor elliptical sector, has been constructed within this year's Swissbau Building Fair as a unique example of an economical and sustainable building which utilises and maximises renewable sources of energy. Also it has become the first multi-storey building in Switzerland to be constructed using predominantly domestic sources and the first building to be completely equipped with economical diode lighting. However, there are many more superlatives about the Woodstock...

If the contemporary architecture is to help minimise the energy sources needed for the building operation and thus contribute to climate warming reduction, then it must respect several rules that, at the same time, represent the key concepts of the so-called Klima(A)rchitektur (climatic architecture): use of regional sources of building material, minimum consumption of service energy, neutral CO₂ balance, solar energy use and replacing the greenery for the built-up area. The Woodstock perfectly complies with all of those requirements. The supporting structure of the building has been made of local beech wood. With its share of 18 per cent, beech is the most frequent kind of broad-leaved trees in Switzerland's forests but 97% of it is used as firewood. That is a pity as it has a very good prospect to become a material for the construction industry and thus partially replace the spruce wood: it contains enough material for accumulation and also has a better fire resistance. It seems that due to modern technologies of processing, drying and

prefabrication, it has been possible to remove its negative property – instability of form, too. Greater use of beech in the wood-processing industry is clearly the right way; moreover, it will help cure the current monocultures of spruce forests, which causes troubles not only in the Czech Republic.

As it would not be efficient, from an economical point of view, to construct the whole building of beech wood only, this material has been used only where it is a real asset. The central skeleton of the building, ceiling and roof structures are formed by massive NOVATOP large-scale panels manufactured of spruce wood in the Czech Republic which comply with all criteria of climatic architecture and structural requirements: overall stiffness, maximum possible size of the elements, stability of form, woodworking accuracy, visual quality, increased fire resistance and minimisation of the structure-born sound that has been reached due to the use of a lime stone fill, which also improves the heat accumulation. By the way – the installation of 600 m² of the NOVATOP ELEMENTS roof panels took less than three hours!

The Woodstock technical equipment is interesting and innovative. Its concept stems from the requirement of complete energy self-sufficiency which has even been exceeded and the Woodstock today produces more energy than it consumes. The basic heating unit is a ground source heat pump connected to a 200 metres deep borehole. The heat pump is powered by electricity produced by photovoltaic cells on the roof with higher capacity than the construction consumption. More photovoltaic cells are embedded in the southern (south-eastern) façade. An interesting element of the northern and north-western façade are face chipboard plates combined with plastic façade elements reinforced with glass fibres in which there are pockets containing substrate with improved insulating properties. The principal aim of such an integrated façade is creating possibilities for the development of nature according to its own rules. It is expected that the plants currently planted “into the façade” will be naturally replaced with wind dispersed plants of the species composition corresponding to a given site. The system of illumination leaves no doubt that the architects have designed the whole building as an economical and sustainable system. Instead of the traditional power-saving bulbs, they have used light emitting diodes (LED) that are many times more economical than any conventional light sources and with an expected service life is 50000 hours. In various rooms of the Woodstock, the very small, compact light sources create exactly the type of light comfort suitable for a given room – bright, although glareless light in the studies, moody, colour-changing light in the living area and active lighting of the façade.

Let’s just hope that the Woodstock is not going to stay alone in its effort to present the self-sufficient, from the energy point of view, and environmentally acceptable buildings, and there will be ever more enthusiasts willing to implement similar new visions and overcome the barriers. That is the only way for the technologies and innovations that we today stare at with astonishment to become soon standard products that will help wooden buildings gain yet more perfect credit.

Project: Ruedi Tobler, Artevetro Architekten AG, Liestal, CH

Construction: Kufmann Holz und Bau AG, Wallbach, CH

Construction system made from massive wood: NOVATOP, Czech Republic,
www.novatop-system.cz

Construction period: approx. 6 weeks, including foundations,

Cost: approx. CHF 2.500.000



Fig. 1 Flora into the façade



Fig. 2 Economical diode lighting



Fig. 3 Photovoltaic cells in the southern façade.



Fig. 4 The supporting structure - local beech wood



Fig. 5 Quick and easy construction



Fig. 6 The central skeleton – NOVATOP construction system from massive wood



Fig. 7 Special windows

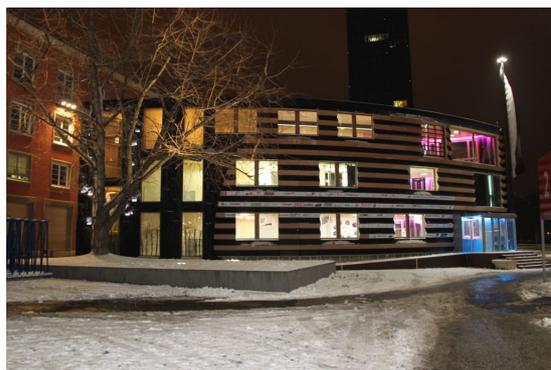


Fig. 8 Self-sufficient and environmentally acceptable building



Fig. 9 Visual quality of massive wood