

Press release

Building report

Flat roof sealing also convincing for passive houses

The first sports and leisure pool facility meeting passive house standards opens in Bamberg

Up until now, tourists and beer connoisseurs have mainly been familiar with the Upper Franconian town of Bamberg. But since 25 November 2011, there is a new highlight for natives and tourists alike. The first sports and leisure pool facility in Europe which was built and certified in accordance with passive house standards officially opened on this date: the Bambados. The public utility Stadtwerke Bamberg as operator developed the "passive bad concept" together with the planning office Rohling AG (pbr, Osnabrück). In the future, it will thus be possible to reduce some 50 percent of the thermal energy demand as compared to new buildings as per the EnEV standard. The sealing of the flat roof superstructure also plays a role in keeping heat loss as low as possible. The specialists in flat-roof sealing from VEDAG GmbH in Bamberg and the REFA Dachbau GmbH in Freiberg actively contributed to making this possible.

This major project costs a total of some 31.8 million euros. In exchange, it has set new standards in the domains of economic efficiency and ecological sustainability. The entire complex includes, in addition to the already-existing and to-be-integrated outdoor swimming pool, an interior area with a gross total area of about 13.500 m². The swimming complex, with sports pool, slides and gastronomy, is located in this area, plus an extensive changing room area, as well as the sauna complex.

In order to fulfill the measures for increasing energy efficiency required by the passive house standard, it must be taken into account that leisure pools of this type are subject to particularly high heat transmission losses resulting from the high room temperatures. Mechanical ventilation is necessary, due to the high level of humidity.

Additional high heat transmission losses can occur as a result. In order to increase energy efficiency, those in charge of the project decided on two optimisation steps:

First: The reduction in consumption. This presupposes a favourable ratio between the enveloping surface and building volume, as well as a very high level of air tightness of the building shell.

Second: The optimised use of the energy made available. This includes enclosing the entire building structure with seamlessly installed thermal insulation with an average 30 centimetres in thickness. The heat transmission loss is thus minimised and the surface temperature on the room side of the facade increased. No condensation occurs, despite the increased humidity.

In order to implement these measures new technical solutions had to be developed to some extent, which were implemented in the Bamberg Bambados for the first time. One of these is the optimisation of the glass surfaces in window frames, in order to prevent overheating of the building in summer and to minimise heat loss in the winter.

The requirements posed by thicker insulation have been fully met

Thick insulation layers put particularly high demands on sealing. This is why the Stadtwerke Bamberg and the flat roof experts from VEDAG GmbH already met early on in the planning phase in order to discuss the technical preconditions together. "Due to the high requirements in implementing the passive house standard there were of course many technical questions posed regarding implementation of the roof work on the part of the Stadtwerke", explains Frank Hunsche, the regional manager at the VEDAG in charge of technical consulting. "Thanks to the short communication channels and the contact persons on site, the entire subproject could be carried through directly, rapidly and simply", according to Ralf Göller, construction subproject head at the Stadtwerke Bamberg.

All those involved also had the advantage that high-quality flat-roof waterproofing providing long-term and sustainable roof sealing had already been laid down. This met the special requirements posed by the use of thick insulation layers.

Capsheet is particularly UV-resistant and suitable for solar panels

The roof structure itself was covered with bitumen membranes. The usual functional layers of a thermally insulated roof structure also came into play. The so-called vapour barrier was first installed on the support structure (VEDAGARD SK-PLUS on the wooden planking and VEDAGARD AL-E on the concrete). The support structure itself is made up of 70 percent concrete and 30 percent wood. The concrete was treated with a bituminous primer (EMAILLIT BV) before sealing the vapour barrier. “We laid down the thermal insulation as the next layer, which is 36 centimetres thick in this case and due to fire prevention regulations composed partly of polystyrene hard foam, partly of mineral wool”, explains Werner Strobel, responsible project head at the contractor firm Refa Dachbau GmbH.

This was followed by the attachment of the double-layered waterproofing from bitumen membranes. In contrast to single-layered sealing sheets, double-layered sealing with bitumen membranes offers the highest degree of security, thus protecting the building in the long term. High-quality elastomer bitumen membrane (VEDATOP TM on the mineral wool and VEDATOP SU on the polystyrene hard foam) was used as underlay. The project participants selected a special welded polymer-bituminous membrane (VEDATOP DUO in dolomite grey) as cap sheet. “VEDATOP DUO is very resistant to UV, weathering and aging influences and is thus particularly suitable for a sustainable type of construction”, explains Frank Hunsche. The decision for a variant in dolomite grey was also taken with regard to energy efficiency standards for the entire building. The light-coloured slate flakes ensure a high reflection effect, thus reducing the temperature of the roof. The high quality of the support and bitumen covering layers also enabled access to the roof without problems in order to install the planned solar panels. It has been demonstrated that high-quality bitumen membranes met all preconditions needed to produce long-term sealing for passive houses as well.



Aerial view of the sports and leisure pool facility Bambados in October 2011. Source: Stadtwerke Bamberg



Johannes Kalusche from VEDAG GmbH (right) and Ralf Göller, head of building services /construction subproject head from Stadtwerke Bamberg, confirm the good collaboration on-site. Source: Stadtwerke Bamberg



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