MONTANA
A Tata Steel Enterprise

Case Study

During running operations: Extensive renovation of the roof of the IKEA warehouse in Itingen

Products:
10'015m^2 MONTANATHERM MTD TL, RAL 9006, 0.63 mm

Builder:
IKEA Lager, Itingen, Switzerland

Client:
Tecton Fladag AG, Pratteln, Switzerland

Architects:
Raumformat GmbH, Gelterkinden, Switzerland

Realisation:
2017

A 10,000 square meter crown

Whether detached house, school building or industrial hall: Every building needs maintenance. Above all, parts that are subject to high stresses – such as the roof – will need to be renovated at some time. An enormous planning and logistical effort is required when the premises underneath the roof also need to remain usable during the renovations – especially when the roof area runs to several thousand square meters. TECTON Fladag AG from Pratteln (Canton of Basel-Landschaft) met this challenge. Last year the company renovated a warehouse in Itingen belonging to the international furniture manufacturer IKEA with over 10,000 square meters of sandwich elements from Montana Building Systems Ltd. Logistic operations continued to run throughout the entire period.

Ten saw tooth roofs with a width of ten meters each form the roof of the IKEA warehouse in Itingen. The building stretches its cusps towards the sky like a crown. However, a roof area of around 10,000 square meters needs to be maintained. After a period of use of over 30 years, the renovation last year was therefore unavoidable. The difficulty thereby was that the big company could not do without the use of the warehouse during the roofing work. A building product was therefore required that would meet the renovation requirements while at the same time being cost-effective and convenient to install.

Hard shell, foamy core

A solution was found in the form of MONTANATHERM MTD TL 185/1000 sandwich elements made by Montana Building Systems Ltd. from Villmergen. "We were familiar with the product and knew that it was ideally suited for the renovation", says TECTON project manager Olivier Rinker. The element is a thermally insulating panel consisting of a 140 mm-thick core layer of polyurethane rigid foam protected by exterior metal covering layers. The sandwich panel has a very good certified lambda value of 0.022 W/mK. Not only that, the MONTANATHERM sandwich panel conforms to the Minergie standard with a U-value of 0.15 W/m2K. Thus, effective thermal protection is achieved in summer and winter, costs are saved and a constant room climate is ensured.

The infinite lightness … of the roof

A further advantage of the element: The simple but high-performance structure guarantees a low dead weight, but at the same time high rigidity of the system. Large spans are thus possible, since the metal outer shells dissipate the tensile and compressive forces that occur in the load distribution. In addition, they protect the construction against the influences of the weather. The hard foam panel in the interior fixes the two outer shells at the desired distance and absorbs the shear and transverse forces when the element is under load. The low weight and the rigidity of the element also facilitates its installation. This is an important point in the case of an industrial building such as in Itingen, because the renovation had to take place during running operations.
In addition, the MONTANATHERM elements meet all requirements for leak-tightness, thermal insulation and vapor barriers and make the use of additional layers during the

installation superfluous. Apart from the pure cost savings, an additional work step is thus also eliminated. The installation time is thus shortened and with it the risk of influencing the actual operational procedures. "The element was thus ideally suited for the renovation of the IKEA warehouse – from the point of view of both energy and installation", Rinker explains. Thanks to the use of CFC and HCFC-free foaming agents, the sandwich panels from Montana are also regarded as being particularly environmentally friendly.

Like a Swiss watch: roofing in coordination

As the entire roof renovation had to take place during running operations, a detailed workflow had to be drawn up first. "Perfect work preparation, planning and coordination was called for", emphasizes Rinker. "We had to guarantee that the normal logistic operations could continue to run without disruption while we removed and re-roofed an area of more than 10,000 square meters." A precise workflow was thus devised for the 10 saw tooth roofs that had to be renovated. This foresaw a one-week rhythm for each saw tooth roof. TECTON thus set itself the goal of removing each saw tooth roof and fitting and sealing a new one in five working days.

Eight detailed work steps were defined in advance in order to meet the requirements: First of all, the old galvanized steel trapezoidal sheets that had previously formed the roof were removed. The fitters used the roof area of the warehouse that was still closed for the interim storage of the removed elements. In the second step, the existing thermal insulation was removed. The roof area was used for the interim storage in this case too. After that the gutter, ridge and flash closures were sealed airtight with vapour barrier foil and butyl tape. In the fourth step, the inlaid channels were formed with the aid of factory prefabricated thermally insulating wedges. In parallel with that the integration of the CNS channels took place using Pluvia inlet elements. These had similarly been preinstalled in the gutters in the workshop. This meant that they only had to be soldered together on the roof in the case of the expansion joints. That completed the weather-independent preparations for the installation of the sandwich elements.

The panels were now lifted onto the hall roof with the aid of the mobile crane. The almost nine metre-long MONTANATHERM elements were then installed manually. "We had six employees on the roof here in order to have sufficient manpower", Rinker recalls. The completion of the ridge and gableboard closures then required the use of far fewer personnel. Bit by bit, or rather sawtooth roof by sawtooth roof, the installation crew thus dismantled the old roof and replaced it with the modern sandwich panels with sophisticated sawtooth roof drainage by means of the Pluvia system. Thanks to this work and the good weather, a modern and high-quality roof was erected in a very short time. And all of that without affecting the running logistics operations of the furniture manufacturer.

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