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Case Study

Family Indoor Playground Whale, Friedrichskoog

Playing inside the whale

Singles or couples without children do not even understand this dilemma: outside it is raining cats and dogs, and inside the little scamps bursting with energy are running rampage. One remedy is in the form of indoor playgrounds. They offer a wide variety of playing games for all ages, with sufficient “space to roam around” to satisfy the irrepressible need to move, and at the same time they are of course independent of any weather conditions. Since December 2008, the town of Friedrichskoog has been offering that kind of entertainment: the Whale - Indoor Playground. The facility is operated by Ideetainment GmbH, Flensburg.

Visible skeleton

Located directly at the harbour, the hall in the shape of a whale provides an indoor area of about 2,500 m². The extraordinary design of the architect‘s office rimpf Architektur, Eckernförde, is based on an idea of Bauplan Nord GmbH & Co. KG, Flensburg. 25 plank trusses span the 125 metre long, 25 metre wide and up to 15 metre high vaulted structure. Window panes in the front area of the hall provide for sufficient daylight illumination. The entrance to the “playing whale” is located in its tail fin. And through the giant jaws little and big visitors can access the outdoor area of the playground.

Professionals much in demand

Naturally, the special shape of the building required quite a high degree of craftsmanship for realising the project.

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Sophisticated roof concept

The exposed location of the building was another challenge as strong winds were more or less constantly blowing during the installation of the outer covering of the whale. The wooden supporting structure was manufactured by Gebrüder Schütt KG from the town of Landscheide, and the remaining works on the outer roof construction were carried out by the roofing company Karsten Poppner from the town of Kappeln.

Sophisticated roof build-up

A facework provided the basis for the subsequent roof layers. On top of it, the roofers applied an elastomeric vapour control layer with aluminium reinforcement and glass fleece which was professionally flashed against the roof lights/smoke vents which were installed along the ridge. The 19 roof lights/smoke vents only play a minor part in contributing to the lighting of the hall. They were installed on the roof, primarily, to serve as smoke and heat vents. One roof light also serves as an exit.

Insulation to follow the shape of the structure

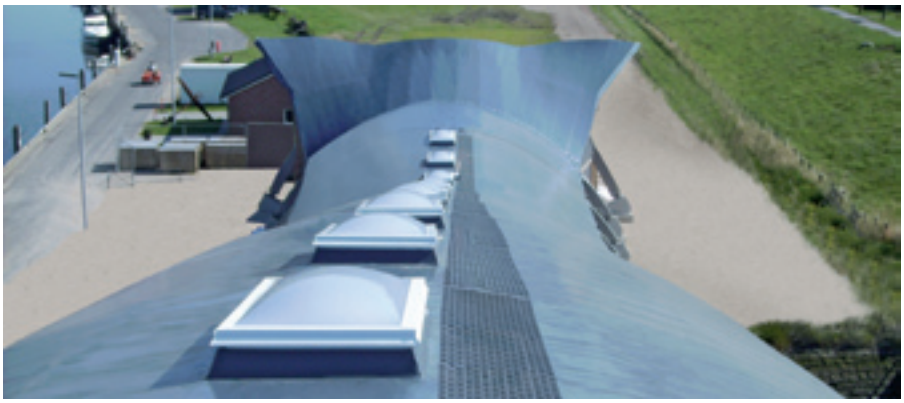
When applying the thermal insulation made of 120 mm thick non-combustible mineral wool directly on top of the vapour control layer the curved form of the roof needed to be mainained. The specialists of the roofing company Poppner therefore did not simply do a “standard” installation of the individual insulation boards on the roof area, but also worked protruding edges, corners and joints, to level any unevenness originating from the substrate. The 25 wooden plank trusses, for instance, always projected over the facework. The individual insulation boards were fastened with screws and plates. Thanks to the accurate preparation work, the three-dimensional bends and curves remained visible after installation of the waterproofing almost without any unsightly edges.

Whale skin made of synthetic waterproofing membranes

The only waterproofing material to be considered for the roof and façade areas was synthetic waterproofing membranes, not only for aesthetic but also for functional reasons. In total just under 3,000 m² of EVALON® V waterproofing was applied.

Corresponding to the shape of the hall its “skin” was to resemble the skin of a whale. Furthermore, the waterproofing and its fastening had to meet the specific requirements brought about by the exposed location of the building and the unusual roof geometry.

This included wind loads, extreme roof slope/form as well as resistance to sea water as the North Sea is just around the corner.



Tested and proven properties

EVALON® by alwitra GmbH from Trier, Germany, was the waterproofing membrane of choice. Based on a high polymer alloy of ethylene vinyl acetate terpolymer (EVA) and polyvinyl chloride (PVC), EVALON® is characterised by consistent properties and an extremely long service life.

EVALON® offers a well balanced ratio of strength and elongation, making it highly resistant to both thermal and mechanical loads.

The challenge of laying

EVALON® V met all the required regulations for installing the severe slope and each membrane was homogeneously sealed to the next by solvent welding. The same technique can be applied whether the EVALON® is supplied un-backed for detailing or with a fleece backing for fully adhering to the substrate or mechanically fixing or indeed in self adhesive form, EVALON® VSK.

It can be installed on any standard roof insulation material without the need for any separation layer. Homogeneous connection of the membranes is carried out either with hot air or with solvent-welding agent. All EVALON® membranes are CE-marked in accordance with EN 13956 and EN 13967.

Unusual working method

Nearly all the installation work on the roof and at the façade of the whale-shaped hall was carried out from a cherry picker. Because of the shape of the building scaffolding was not an economically reasonable solution. The roofers also installed the waterproofing using this rather unusual method.

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Lively architecture

First, the cut-to-length waterproofing membrane was fixed at the ridge and rolled out. After aligning the membrane, the roofers also fixed it at the base of the façade. They then sealed and connected the membranes using solvent-welding agent.

They used the cherry picker, at working pace, moving upwards along the membrane seam. They then fixed the membrane in the seam area with plate anchors. In order to prevent likely wind uplift, the membrane was also fastened with field fasteners. Based on the individual wind load calculation for this special project, which was provided by the manufacturer of the fastening system, the architect designed a layout of fixings resulting in a specific pattern.

Detail work

Façade trim

The lower trim at the base of the façade was carried out with system components of EVALON® coated metal sheets.

Further system components like weldable non-slip inspection walkway tiles in the ridge area along the smoke vents/ roof lights or special preformed details for waterproofing roof penetrations (e. g. lightning conductors or attachment points) provide optimal waterproofing solutions and “seamlessly” blend in with the whole.

Conclusion

For the waterproofing of the new Whale Indoor Playground in the town of Friedrichskoog both quality materials and excellent craftsmanship were required.

The roof and the façade are seamlessly merged into one another, additionally accented by the material and the colour of the outer skin. The professional and impeccable installation contributed a great deal to the outer appearance, too.

Thus, the Indoor Playground in the town of Friedrichskoog is an outstanding example of the successful implementation of an exceptional architectural project.

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alwitra in brief

alwitra Flachdach-Systeme in Trier, Germany, is a supplier of complete flat roof systems operating globally for more than four decades. In addition, alwitra ranks among the leading experts for designing and implementing state-of-the-art photovoltaic systems on flat and low slope roofs.

The comprehensive product range includes waterproofing membranes EVALON® and EVALASTIC®, the world's first power-generating waterproofing membrane EVALON® Solar, the innovative PV system SOLYNDRA® Solar, as well as aluminium profile for roof edge trims and integrated details like rainwater outlets, vents and rooflights. Furthermore, alwitra is a member of numerous national and international associations.

Construction site sign

Family Indoor Playground Whale, Friedrichskoog

Investor:	town of Friedrichskoog
Design, planning, site management:	rimpf Architektur, Eckernförde Stefanie Suckow / Frank Bertram
Design of supporting structure:	Frick & Petersen, Flensburg Norbert Petersen
Roofing works:	roofing company Karsten Poppner, Kappeln
Material:	alwitra EVALON® V
Colour:	slate grey
Area:	approx. 2,900 m²

alwitra GmbH & Co. · PO Box 3950 · D-54229 Trier
Phone +49 651 / 91 02-0 · Fax +49 651 / 91 02-248
export@alwitra.de · www.alwitra.de

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