



Keselstraße hydroelectric power station, Kempten

Allplan in practice

AESTHETIC SHELL FOR REGENERATIVE ENERGY

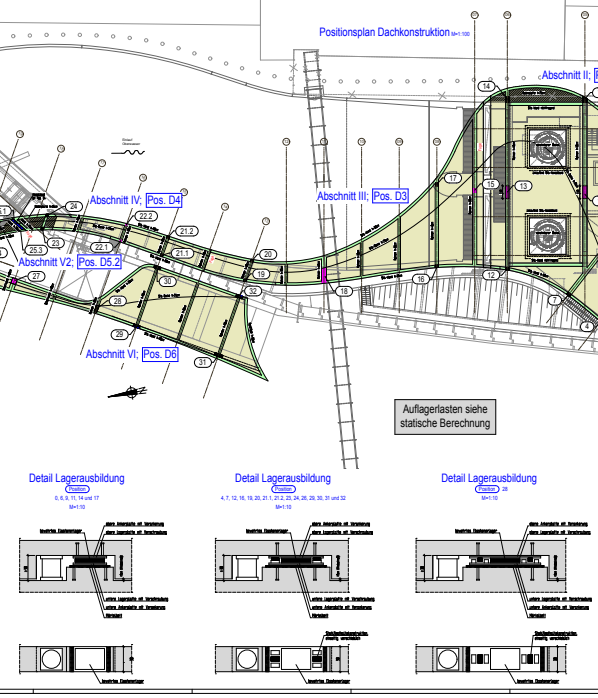
The new run-of-the-river power plant on the Iller river at Kempten impresses the viewer with its dynamic, elegant form.

The almost 100 meter long sculptural shell conjures up numerous associations: from whales or waves through to polished boulders. The power plant replaces a building from the 1950s and currently supplies around 4,000 households with a capacity of around 14 gigawatt hours per year.

In a competition, the building client, Allgäuer Überlandwerk (AÜW) Kempten, requested a building design to harmonize with the protected group of buildings opposite, comprising the former Rosenau

spinning works and weaving works. The result is a multiple award-winning structure: It won the German Architecture Prize 2011, the German Concrete Architecture Prize 2010, the German Industrial Building Prize 2010 and made it into the final selection for the International Liechtenstein Prize for Sustainable Construction in the Alps 2010.

The concept devised by the Becker Architekten architecture office planned to link up the two end points - the power house (with generators and



transformer) and the flow restrictor weir (with trash rack cleaning system) via a continuous building shell. Approximately half-way along, this shell passes through the historic steel trussed arch of the cable bridge. Despite the overall size, the architects wanted to create a highly differentiated, organic form that on the one hand blends in with its environment, but on the other is perceived as an independent building thanks to its design.

When the structural engineers from Konstruktionsgruppe Bauen AG, Kempten became involved in the project, a decision had not yet been made regarding the materials. Ultimately, a concrete structure was chosen to enable the organic form enclosing the plant to be realized. The civil engineers first used hand drawings to help determine the points at which the structure can be supported by the existing technical installations. The shell was divided into six sections, first to provide the expansion joints required by the thermal conditions and second because the roof supports needed to be permanently fixed at some points, and movable at others.

In the next step, the engineers developed a rib structure for the concrete construction. It had to fit in with the overall image, but it was also necessary to be able to split it into six segments. Models of the concrete shell were then created with a high level of geometric detail in Allplan Engineering to serve as the basis for reinforcement and shell design. The result is a monolithic concrete roof structure of freely curved rib arches, curved walls and arched roof

PROJECT INFORMATION OVERVIEW

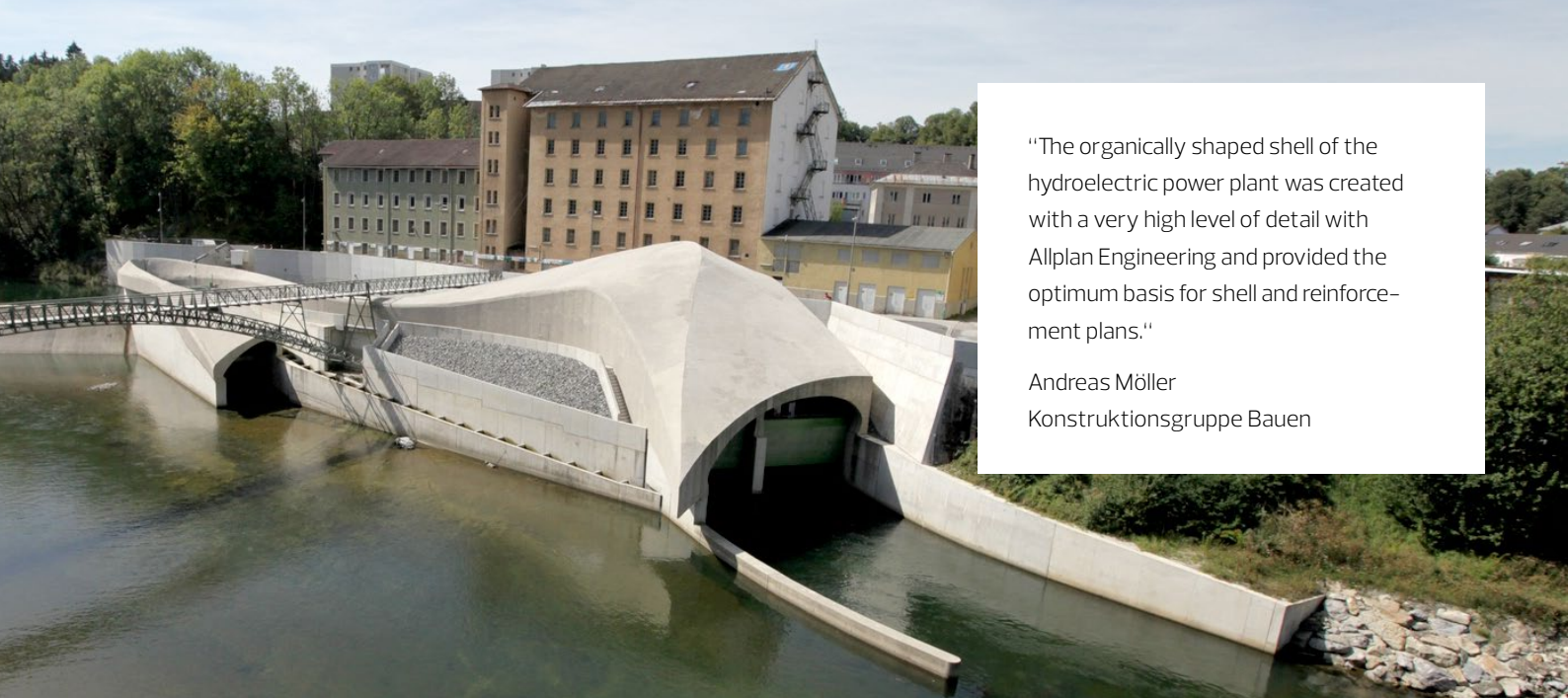
- > **Building typology:** Hydroelectric power station
- > **Software used:** Allplan Engineering

PROJECT DATA

- > **Structural engineering design:** Konstruktionsgruppe Bauen AG, Kempten
- > **Earthworks structural design:** RMD Consult, Munich
- > **Architecture:** Becker Architekten, Kempten
- > **Client:** Allgäuer Überlandwerk AÜW Kempten
- > **Construction start date:** November 2007
- > **Completion:** July 2010
- > **Cubature:** 3,865 m³
- > **Usable area:** 590 m²

surfaces. The large free span of the rib arches is 9.3 meters, the concrete areas are between 20 and 25 centimeters thick.

The hydroelectric power plant on the Iller is a building that aesthetically enriches its environment, rather than detracting from it. Among other things, it therefore plays a role in generating support for electricity supplied via regenerative energy. The Iller power station is part of the "hydropower world" accessible to the public via an unbroken foot and cycle path along the river. This path runs directly between the old spinning works and the new power station and passes the impressive, high interiors with their concrete ribs. It's a view that makes you feel as though you are inside a modern cathedral.



"The organically shaped shell of the hydroelectric power plant was created with a very high level of detail with Allplan Engineering and provided the optimum basis for shell and reinforcement plans."

Andreas Möller
Konstruktionsgruppe Bauen

Konstruktionsgruppe Bauen AG, Kempten covers the whole range of project planning from bridge construction and civil engineering, structural design and structural inspection through to building management for both new constructions and building in the existing assets. Expert opinions and building inspections in bridge construction and structural engineering round out the services offered by Konstruktionsgruppe Bauen AG.

In the area of structural design for structural engineering and industrial construction, Konstruktionsgruppe Bauen deals with all questions relating to structural analysis, construction and building management with the aim of creating economically feasible solutions with a high planning quality.

ABOUT ALLPLAN

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support interdisciplinary collaboration on building and civil engineering projects. Around the world over 500 dedicated employees continue to write the ALLPLAN success story. Headquartered in Munich, Germany, ALLPLAN is part of the Nemetschek Group which is a pioneer for digital transformation in the construction sector.

ALLPLAN GmbH
Konrad-Zuse-Platz 1
81829 Munich
Germany
info@allplan.com
allplan.com