



Visualization of the external facade at Laura-Henzner-Weg, Visualization: ZUEND, Zurich

**Allplan in practice**

## A LABORATORY BECOMES AN EXPERIMENT – HIF RESEARCH BUILDING AT ETH ZURICH

The HIF complex of buildings – home of the Department of Civil, Environmental, and Geomatic Engineering – is an aging concrete building on the ETH Hönggerberg campus outside Zurich. It houses laboratories and a large testing hall that is a steel structure. The buildings are to be reconstructed from the ground up and will continue to be expanded during ongoing operation. With the reconstruction the client also wanted to achieve various Swiss energy labels, such as the Minergie-ECO label, the GI Seal of Approval (Good Indoor Climate) and a certification of SGNI (Swiss Sustainable Building Council). As part of the reconstruction, the building will partly be dismantled down to the

frame and then rebuilt. Part of the planning also includes a reclassification of the uses: the offices are to become laboratories. In addition, the eastern complex of buildings will be expanded to include a new laboratory and the central part of the building will be expanded to include a small testing hall. The renewed façade is a combination of the old and new building. Rear-ventilated wooden panels are used as the cladding for the laboratories and offices, supplemented by glass panels that also act as photovoltaic elements. The Swiss architectural firm Stücheli Architekten is planning the reconstruction and expansion of the building complex in 3D using Allplan Architecture.



Interior visualization of new testing hall – Visualization: ZUEND, Zurich

## THE CHALLENGE

This project was a challenge for everyone involved, right from the start. In addition to the client's BIM requirements, combining the old and new building was also a demanding task. Data that was planned to be reused from the existing building was sometimes only partially available or only present on paper. This project provided the perfect opportunity to use the exciting capabilities of BIM. BIM would be used in the inventory phase to digitally record the existing building and transfer the data obtained into a three-dimensional model.

Stücheli Architekten were commissioned as the project managers by ETH Zurich and were also responsible for the BIM coordination and management. The entire construction project was to be an outstanding example of openBIM. As such, all parties – including the client – had to commit to the approaches and methodology of the BIM working method from the outset.

## THE SOLUTION

Stücheli Architekten and ETH Zurich had specifically prepared themselves for a project of this kind. The architects had already begun to implement BIM within their working practices many years ago. They had founded an in-house group that developed their BIM methodology, objectives, and structures within a BIM project. As a result, the architects already had a relationship with the experts

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> **High level of transparency in the planning process**

> **Facilitated coordination of the planning participants.**

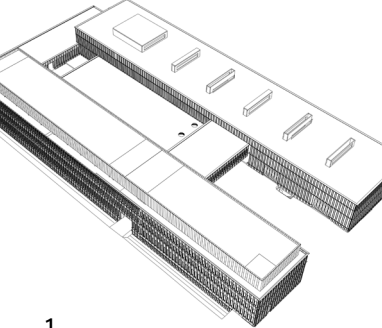
> **BIM as a comprehensive method ensures quality in the project**

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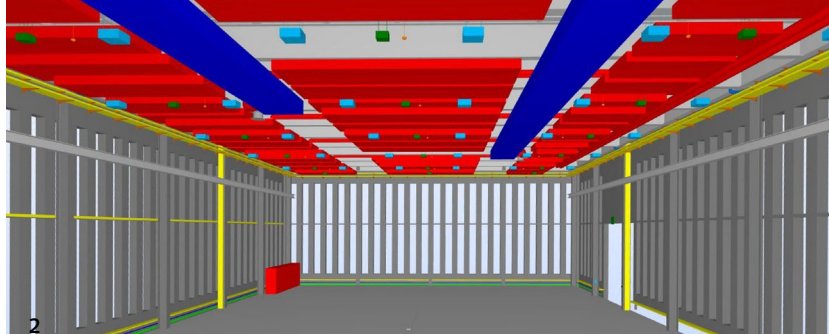
and experience of using Allplan Architecture in 3D. This preliminary experience with BIM meant that Stücheli Architekten had internal BIM guidelines, clearly defined working methods and procedures, as well as elaborate forms and templates. ETH Zurich had developed a BIM guide before this construction project. This subdivided the targets to be achieved into categories and defined the required methods. The guide served as a basis for their BIM requirements and would be developed further during the project.

At the start of the planning, the building was partially recorded with 3D laser measurement technology and the gaps in the existing design data were filled. This recording was continued after the dismantling of the existing elements. The scatter plots that resulted were then converted into a three-dimensional BIM model. The architects clearly structured the project from the start as part of their BIM management and coordination

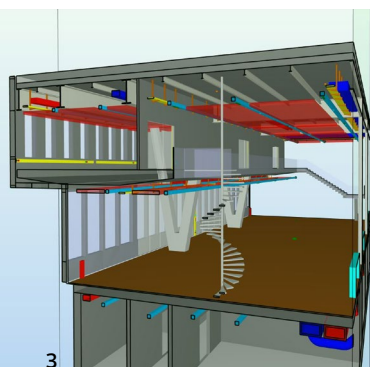




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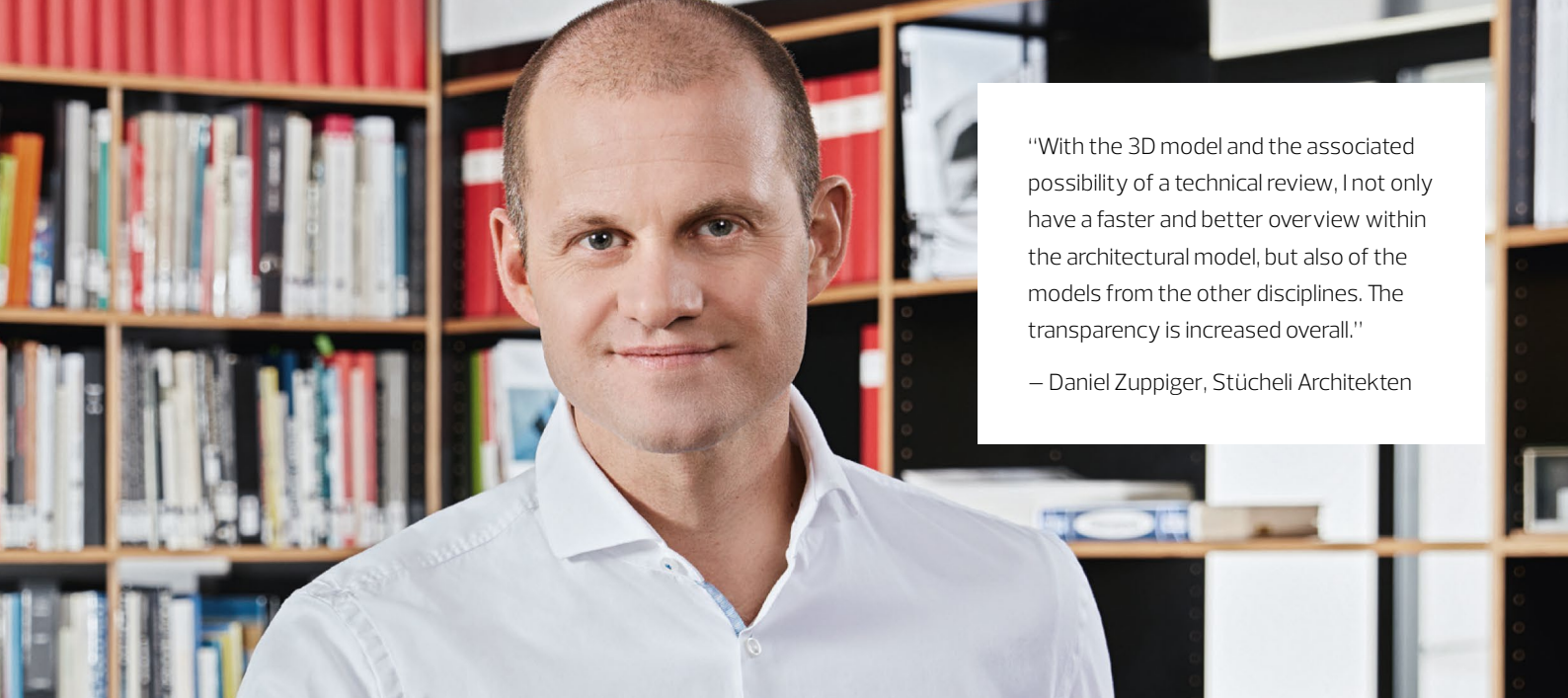
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1 Axonometric projection of the entire building (ALLPLAN)  
 2 and 4 Testing hall, material concept (Solibri)  
 3 Exhibition hall (Solibri)

role. First, they developed a project development plan, then they began to create a reference model for the building. This reference model served as a basis for the models of the other planning trades. As a result of this process, there are a total of five three-dimensional specialized models for the HIF project, broken down into: architecture, supporting structure, HVAC and sanitary engineering, electrical, and laboratory. The latter is used to plan the construction of the laboratories. In turn, these specialized models were used to create a central model as a basis for coordination. It represents the current state of planning, is available to all those involved in the project and is used for the central exchange of data. This occurs via exchange formats, such as .ifc and .bfc. Two-dimensional information is exchanged as .dwg or .pdf.

Technical decisions are made, quantities are determined and collision checks are carried out based on this coordination model. In addition, general topics such as design and user aspects can be discussed. The BIM model created in Allplan Architecture is gradually updated with information. The different project participants access the BIM model via Solibri, another product from the Nemetschek Group.

Stücheli Architekten also use the BIM model; for example, they used it to enhance the detailed design and improve design clarity. Stücheli Architekten cannot currently quantify the time savings BIM offered on this project. But they did draw one clear conclusion: the architects saw significant added value from BIM through increased project understanding. The project was coordinated better, was more transparent and all participants were involved in the project earlier and more in-depth. That is why, for them, the future already belongs to Building Information Modeling. "A great deal is more easily visible through BIM," said Mr. Zuppiger from Stücheli Architekten.



"With the 3D model and the associated possibility of a technical review, I not only have a faster and better overview within the architectural model, but also of the models from the other disciplines. The transparency is increased overall."

– Daniel Zuppiger, Stücheli Architekten

## THE CUSTOMER

In 1946, Werner Stücheli founded the architectural firm named after him in Zurich. The trigger for this was a competition he won for the animal hospital in Zurich. In the 1970s, Stücheli Architekten expanded and today they employ 85 workers from 17 coun-

tries. They are one of the largest architectural firms in Switzerland. They offer comprehensive services in all phases of a construction project or alternatively take over responsibility for the entire project as the project architect.

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## ABOUT ALLPLAN

ALLPLAN is a global provider of BIM design software for the AEC industry. True to our "Design to Build" claim, we cover the entire process from the first concept to final detailed design for the construction site and for prefabrication. Allplan users create deliverables of the highest quality and level of detail thanks to lean workflows. ALLPLAN offers powerful integrated cloud technology to

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.

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