

Project:
Biomass receiving and
treatment plant
"Ara Region Bern AG"

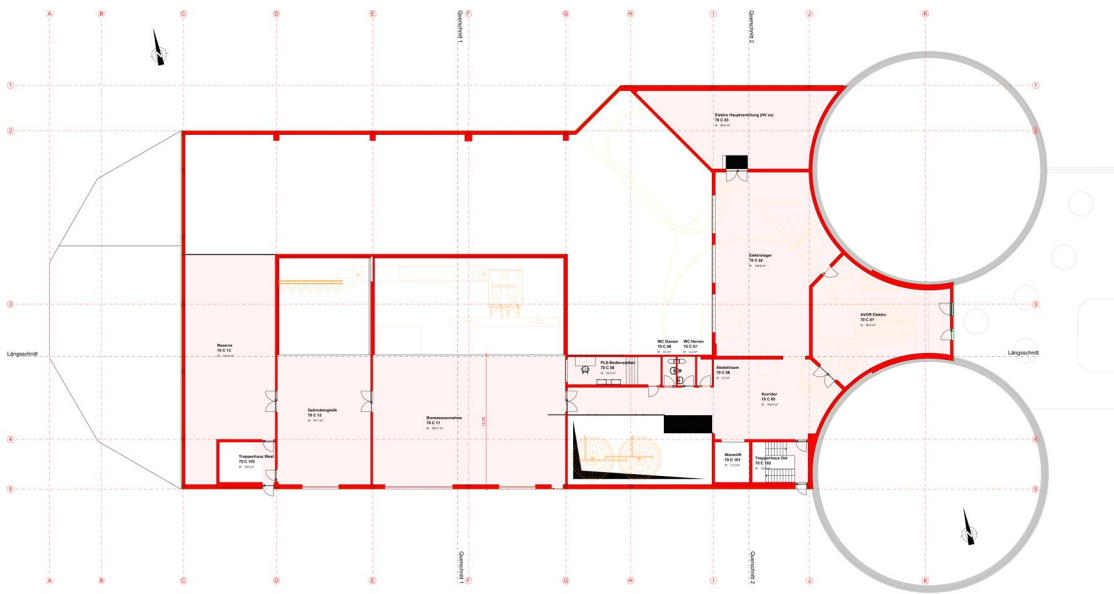
(3D model BIM software
Allplan Engineering)

Allplan in practice

BIOMASS RECEIVING AND TREATMENT PLANT "ARA REGION BERN AG"

"Ara Region Bern AG" is one of the largest wastewater treatment plants in Switzerland. Every year, around 30 to 35 million cubic meters of wastewater are treated here. In addition, "Ara Region Bern AG" produces biomethane gas and feeds the annually produced quantity of 54 GWh into the public gas grid of the Bern municipal utilities. The biogas is created through the biological decomposition of biomass. In Bern, this is mostly sewage sludge (nearly 90 percent). The rest comes from external biomass. The latter consists of organic residues, which are delivered by large distributors or restaurants, for example. The fermentation occurs in three digestion towers, also called fermenters. In the

subsequent refining process, the CO₂ is removed from the biogas to produce the biomethane. With the construction of a new receiving and treatment plant for biomass on the site of the former sludge drying plant, "Ara Region Bern AG" will be able to increase the future production of biogas by around 25 percent. German civil engineering company "ingenta ag ingenieure + planer", based in Bern, is responsible for the overall management, the construction planning and BIM management of the new planned building. The people responsible hope to be able to start work in November 2018 once the building permit has been issued. The plant commissioning is scheduled for the end of 2019. Another



Plan level C
Biomass receiving and
treatment plant
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(BIM software Allplan
Engineering)

project of "Ara Region Bern AG" is the "high load biology for the treatment of industrial wastewater from CSL Behring." On average, the company invests approximately CHF 13 million annually in the maintenance, replacement and expansion of existing plants.

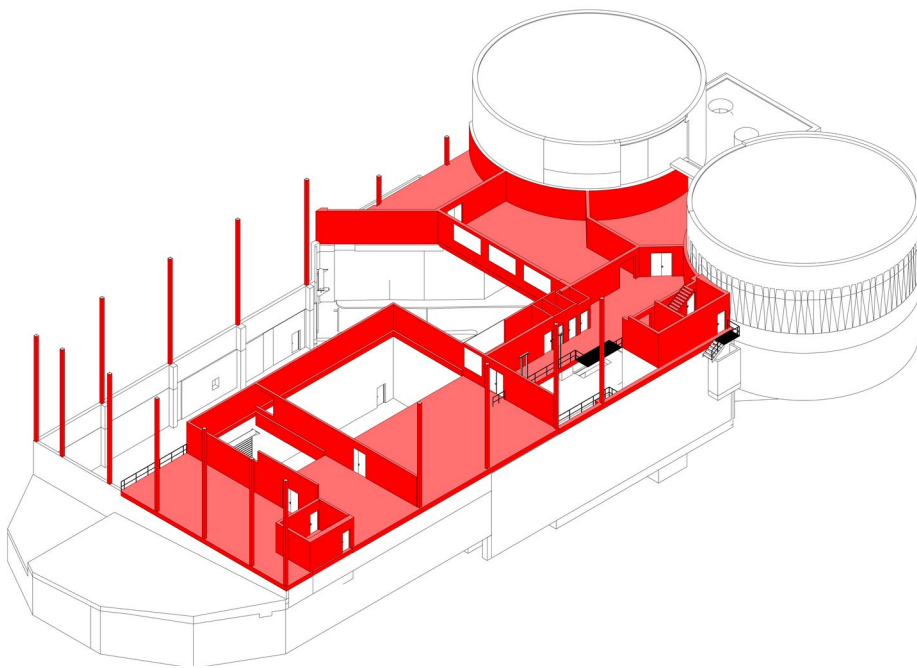
A NEW PLANT WITHIN EXISTING COMPONENTS

The client describes the targets of the new receiving and treatment plant as follows: It is intended to allow an efficient materials handling and extensive separation of impurities with a high degree of automation. Since the foundation walls of the former sludge drying plant are still retained, the new building is also a building alteration at the same time: "On the one hand, we had to align the new building with the structures present on the existing foundation walls, but on the other hand, we had to coordinate the operational requirements with the entire receiving area as well as the process technology for treating the biomass," says project manager Hans Peter Bütikofer from "ingenta ag ingenieure + planer" as he describes the challenges. The new building must meet qualitative architectural requirements: The external appearance of the 62.5 meter long, 36 meter wide and 20 meter high hall must match the existing structures. No static elements are desired within the floor plan so that the hall can be used as flexibly as possible. For this reason, timber lattice girders will span the hall, which is up to 36 meters wide, without columns. The hall will be reinforced by wind bracing in the facade levels. In the

roof frame, the reinforcement will be established with wooden element panels. Inside the hall, walls and slabs in in-situ concrete will be used to create the new rooms. The dumping and unloading area will take up the largest volume in the hall. This is deliberately located within the hall in order to largely avoid odors and noise escaping to the outside. The treatment technology is arranged in such a way that the material flow is possible with short transport distances. In addition, care was taken to ensure that all components are easily accessible for maintenance and repair. All of these conditions place high requirements on the project managers at ingenta ag, which CEO Andreas Liesen describes as follows: "The size of the hall was defined by the local conditions and building regulations. Its interior was defined by the client's catalog of requirements and the plant planners' specifications. It was not easy to harmonize all of these needs. But with 3D planning and Allplan Engineering, we have the ideal prerequisites for developing the best possible solutions with everyone involved."

3D PLANNING AND OPEN BIM SOLUTION ALLPLAN BIMPLUS

Since January 1, 2018, every project at "ingenta ag ingenieure + planer" has been processed in 3D models. After an extensive evaluation process, the company decided to purchase the BIM solution Allplan Engineering for this step in the fall of 2017. "We use Allplan Engineering to develop 3D models and exchange data in BIM projects. We also use the openBIM solution Allplan Bimplus, says Andreas



3D representation
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Liesen, referring to the current uses. For the new building of the biomass receiving and treatment plant, ingenta submitted a proposal to the client to implement this construction project as a BIM project. "The client was excited about this, especially about the benefits in the operating phase during the entire service life of the plant," explains Andreas Liesen. The 3D model was created based on laser scanning of the existing building parts completed by external specialists. "That was great at the time, but not really what we needed, since the model consisted of pure 3D solids and could not be converted into components," explains Matthias Hitz, who is supervising the project as a BIM modeler. He then drew his model into the existing foundations of the model. "It may be one of the first BIM projects to include building alteration and a new building," he figures. The finished model was provided to all planners involved in the project. "We have the ideal platform for this with the coordination tool Allplan Bimplus," says Matthias Hitz as he shows the tool excitedly. The client also values being able to make cuts at any point and are made visible thanks to Allplan Bimplus. The object-related BIM development plan that was created forms the basis for planning with BIM. The other details were discussed and determined among all those involved in the project during several workshops. All documents for submitting the building application were created by the end of March 2018. "At the same time, however, we are already planning further. That's the advantage of BIM: The different planning states come together in one model," says Matthias Hitz as he describes the current status of planning.

What are the advantages of 3D planning in this project for the responsible BIM modelers? "The biggest advantage that I see is coordination: On the one hand with external specialist planners, and on the other hand for us internally between project managers and designing engineers." The company utilizes the BIM capability of the Allplan program as much as possible, but still sees potential here, as Andreas Liesen explains: "In the future, we would like to utilize the information from the BIM model even more intensively to create service directories. And who knows, perhaps in a few years only the model will be submitted to the entrepreneur as part of the offer tender!" Matthias Hitz still sees potential in using Allplan Bimplus: "At the moment, we are using this primarily for visualization. In the future, we would also like to use it for visual inspection and to apply tasks." Andreas Liesen is excited about the positive impetus these changes in software possibilities have triggered at ingenta: "The current developments have breathed new life into the office operations and most of the employees have rediscovered the fun of planning!"

FACTS ABOUT THE CONSTRUCTION

- > **Client:** Building construction technology
 - > **Development of the project / BIM management:** ingenta ag, Ingenieure + Planer, Bern
 - > **Start of construction:** November 2018
 - > **Commissioning:** December 2019
 - > **Floor area:** 2000 m²
 - > **Building volume:** 40.000 m³
 - > **Building costs:** approx. CHF 25 million
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The project managers and modelers use the 3D model (Allplan Engineering) through the open BIM platform Allplan Bimplus to jointly discuss and solve technical challenges.

Hans Peter Bütikofer (project manager)
Matthias Hitz (BIM modeler)

ingenta ag, Bern

THE ENGINEERING FIRM

"ingenta ag ingenieure + planer", headquartered in Bern, realizes challenging projects in structural and civil engineering. A team of around 40 specialists has made it their task to make the impossible possible – and to show that extraordinary and challenging requirements can be conquered with innovative solutions. "We provide one third each of our services in structural engineering, civil engineering and project management," says CEO Andreas Liesen as he explains the company's areas of work.

Software programs from various providers help the employees to process these projects. This has also included Allplan Engineering since fall 2017.

3D planning has been a topic for several years and has been consistently implemented since January 1, 2018. At the same time, employees have been and are being trained to meet the new requirements. "The ALLPLAN training courses also make an important contribution here," explains Matthias Hitz.

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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