



BIM project: Hotel complex  
Costabella near Opatija,  
Croatia

Allplan in practice

## HOTEL COMPLEX COSTABELLA

South Bohemian Office for Structural Engineering, Statika has planned a hotel complex in Croatia with BIM

The Costabella hotel complex currently under construction near Opatija in Croatia was modeled in 3D due to complicated foundation conditions and the need to solve the construction and technologies in their entirety.

The resort is founded on terrain sloping down towards the Adriatic Sea. It consists of a main building and four villas. The outdoor pool is an independent structure and is connected to other parts of the hotel complex by an elevator and a

staircase, which provides easy access from the hotel down to sea level. The hotel building has four basement floors and six upper floors. On the lowest floor, a fitness studio is available to guests. One floor above is a wellness centre with associated technical utility rooms and a parking area. Further parking spaces are located on the second basement level, which contains an indoor pool and a fee-paying parking garage. The first basement level houses the hotel's catering area with restaurant, kitchen and lounges.



The hotel complex was founded on a site sloping down towards the Adriatic Sea.

Hotel guests enter the hotel via a hotel lobby with reception on the first floor level. The next four floors are exclusively for the accommodation of guests with a total capacity of 132 rooms. On the top floor there is an accommodation unit and a restaurant with a roof terrace.

The four villas, which complement the main building of the hotel, have different ground plan dimensions and two to three floors. Two villas reflect the sloping terrain – their receding floors are terraced. The villas offer a total of 63 apartments.

### **COMPLICATED FOUNDATION CONDITIONS AND THE CONSTRUCTION SOLUTION**

The structural part of the project including the structural analysis was designed by the Statika office – Jihočeská stavebně konstrukční kancelář s.r.o. The project team had a hard nut to crack, as the building was to be founded on complicated foundation conditions. The foundations of the individual structures had to be built on rocky and semi-rocky ground with different degrees of weathering. Seismicity at the construction site also had to be taken into account in calculations and modeling. For a complete simulation of the respective situation, auxiliary calculations for elastic subsoil were also carried out using the Soilin module.

Based on the calculations and models, foundation plates and strip foundations were used for the foundation. Most of the structures were designed as monolithic reinforced concrete structures, smaller parts consist of prefabricated reinforced concrete parts or steel elements.

### **THE 3D MODEL AS AN EFFICIENT PROJECT PLANNING TOOL**

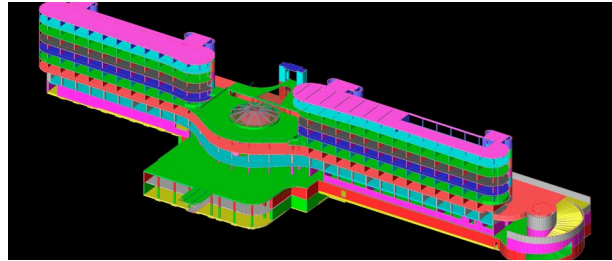
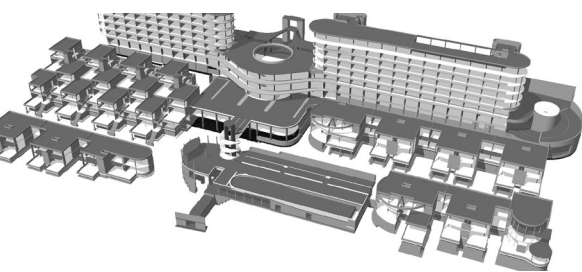
The creation of 3D models of individual structures as well as the design documentation at the execution design level, including a detailed reinforcement design, was carried out using the Allplan Engineering software solution. The structural analysis was done with SCIA Engineer.

Using Allplan Engineering, individual structures could be created as 3D models, the views and sections could be derived from them and then the reinforcement drawings and associated documents could be worked out in detail. Compared to 2D modeling, this solution provides a better overview of complex shapes and easy creation of sections. A clear advantage is that all adjustments and changes are immediately displayed both in the overall model and in individual drawings. This eliminates possible collisions and makes the design process more efficient overall.





Picture above: View of the concrete ceilings with capitals in the restaurant area



Left picture: 3D model of the hotel in Allplan Engineering

Right picture: 3D calculation model in SCIA Engineer

## INFORMATION EXCHANGE WITH ALLPLAN SHARE AND ALLPLAN BIMPLUS

The Allplan Share module was used by the project team to enable several designers to work simultaneously. This advanced the planning phase and enabled possible collision points to be identified at an early stage. The open BIM platform Allplan Bimplus was used for communication between the project participants, construction designers and representatives of the client and proved to be a suitable tool for better orientation and coordination in spatially complicated building sections.

Due to the structural analysis using the SCIA Engineer software and the subsequent modeling and reinforcement in Allplan Engineering, as well as the scope and complexity of the project, the project team of Statika has gained a lot of valuable experience, which will certainly be useful for future projects.

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### PROJECT INFORMATIONS AT A GLANCE

- > **Main focus:** Engineering, BIM
  - > **Software:** Allplan Engineering, Allplan Bimplus, Allplan Share, SCIA Engineer
  - > **Contractor:** JTH Costabella d.o.o.
  - > **Architect:** Ing.arch. Vladi Bralič
  - > **General planner:** Atelier EIS.CZ s.r.o.
  - > **Construction design:** Statika – Jihočeská stavebně konstrukční kancelář s.r.o.
  - > **Building phase:** 2017–2019
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The receding floors  
are terraced.

## THE CLIENT

The engineering office Statika was founded in 1996. The main areas of activity include the production of structural parts for projects of residential, industrial and commercial buildings. Projects are processed by us at all stages of project documentation, including production documentation of monolithic as well as prefabricated reinforced concrete structures and steel elements. With regard to the materials used,

these are reinforced concrete, steel and wooden structures, the project part also includes foundation designs. A majority of projects are created in 3D (BIM). The company currently employs nine engineers and three designers. Our aim is to find the optimal and efficient construction solution from the design, through the construction project to the erection.

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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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