



ALLPLAN ENGINEERING IN PRACTICE

Redeveloped efficiently

📍 A2 freeway, Stansstad-Beckenried, Switzerland

For all those involved in the project, repairs to the 12-kilometer section of the A2 freeway between Stansstad and Beckenried is a particular challenge. Between 2013 and 2017, the section of road, which has been in use for 40 years, will be redeveloped in three construction stages at a cost of around 278 million francs. The 12-kilometer section of road will be redeveloped in three stages: the first stage in May and June 2013, the second section of road between January 2014 and June 2015, and the third section between June 2015 and April 2017. All work will be carried out among traffic; in other words, two lanes will usually be available throughout the construction period in both directions for the up to 40,000 vehicles that use the road every day. Engineering firm CES Bauingenieur AG of Hergiswil was commissioned to project manage and supervise the construction of the first and second stages of implementation. The construction price for these two jobs is around 70 million francs and, on the section of road between Stansstad and Stans Süd (Stans South), includes the following services: replacement of road surface in both a northerly and southerly direction, expansion of soundproofing, replacement of freeway drainage system and operational and safety facilities, construction of new street wastewater treatment systems, and structural repairs.

Markus Walker explains what high demands this project places on everyone involved. The graduate in civil engineering and managing director of CES Bauingenieur AG says: "The repair work must be carried out within a short

space of time, among traffic, and in very tight spaces on site." To meet these demands, the repair work on the Stansstad section to freeway exit Stans Süd, including the preferred measures, has been divided into six phases. It is only necessary to close freeway entrances and exits for a short time during resurfacing work.

The A2 repair project between Stansstad and Stans Süd was also a particular challenge for Patrick Zumbühl, graduate engineer specializing in civil engineering: "It is the first project of this size that we have fully designed using Allplan's Highway tool." Patrick Zumbühl has already been working with Allplan for over 16 years, but until now, there has never been a project that has been fully designed using the Highway tool. Why was that? Markus Walker provides the answer: "If people don't work with the Highway module on a regular basis, with 3D visualization in particular, they are unable to practice with it enough. For the A2 repair project, we took a project-specific training session with Allplan Schweiz AG. Taking a 200-meter section as an example, we worked through each step together." Today, Markus Walker and Patrick Zumbühl are proud that they were able to plan and implement this project using Allplan Highway. With the experiences they have gained, they are looking to the future full of vigor, as Walker explains: "Another maintenance project for a section of freeway is already coming up, which we will plan with the assistance of Allplan Highway."



Patrick Zumbühl explains the structural engineering features of the A2 repair: "The existing surface of the northern and southern lanes will be replaced completely and strengthened by means of milling and resurfacing. The existing longitudinal slope is between a 0.25 and 0.7 percent gradient, and therefore places high demands on the accuracy of the installation of the new road surface." He was able to meet these needs as efficiently as possible using the Allplan Highway module.

"The project placed high demands on the accuracy of the installation of the new road surface. With Allplan Highway, I was able to meet these demands as efficiently as possible."

Patrick Zumbühl, CES Bauingenieur AG

Based on the digital terrain model for this situation and additional aerial photographs, Patrick Zumbühl determined the new 3D route plan and gave the contractor the road details based on this plan. With this information, milling work can be carried out on the surface of the base layer and, where necessary, the binder course be laid on the construction site using three-dimensionally controlled machinery. Only by doing so is it possible to meet the high demands on the accuracy and evenness.

Patrick Zumbühl is very positive about his experience with Allplan Highway, but is still able to see potential for further personal development too: "It is a very user-friendly tool. In the cut and fill calculation in particular, you could generate many more uses with this software." The skilled civil engineer shared plenty of ideas with Nemetschek Allplan Schweiz AG whilst developing both the pre-project and the project parts of the A2 project, and is also trying to introduce potential improvements all the time. "In this regard, I have found Allplan to be a very open, pleasant, and open-minded partner at all times."

PROJECT INFORMATION AT A GLANCE

Focus: Road construction

Software used: Allplan Engineering/Allplan Highway

Involved in the construction work:

- Client: Federal Roads Office (FEDRO), infrastructure branch, Zofingen
- Project drafter & construction management: CES Bauingenieur AG, Walker + Rüfenacht, Hergiswil

Project data for the section of the A2 from Stansstad to Stans Süd:

- Construction costs: 70 million francs
- Construction period stage 1, May/June 2013
- Construction period stage 2, January 2014-June 2015
- Surface lifting and road milling: 24,500 m³
- Gravel mixture: 17,000 m³
- Tarmac surfaces, various types: 65,000 tonnes
- Road cutting: 89,000 m³