Final steps to finish for the largest “Emmentaler” Tunnel

In the lower Emmental, this 1.6 kilometre-long tunnel is being built below the River Emme. It is part of the Bahn2000 new construction section that will allow travel from Bern to Zurich. Using automated steering with a 3D-Machine Guidance System of Leica Geosystems, shoulders have now been laid in the biggest “Emmentaler Hole”.

The Swiss countryside is riddled with newly-created traffic routes. They break through not only the massive alpine mountains like the Gotthard, but also travel under riverbeds, such as the River Emme in central Switzerland. At the end of 2001, a new stage of the Bahn2000 project was completed – the “Emmen-tunnel” break-through – advancing further with the building of the “Matt-stetten-Rothrist” section, using the newest technology to build the concrete side flanks. This tunnel is one of nine on the 41.5 kilometre stretch.

The last two years has seen the creation of 1.6 kilometres of tunnelling under the river, followed by the track section in December 2001. The shoulders have been built in concrete, using new technology with millimetre-exact precision to create a perfect three-dimensional profile.

A world first in tunnel construction: shoulders with three-dimensional controlled slipformer

This is the first project in the world, where a tunnel has been concreted with the complex shoulders 3D-controlled sliding form. The concrete slipformer, owned by the building company Walo Bertschinger, automatically followed millimetre-exact data calculated by Project Engineers Schaellibaum using the Leica Geosystems’ 3D-Machine Guidance Systems in a closed work-process. The finished concrete was supplied to the front of the slipformer from trucks to allow for exactly the correct dimension and position for the shoulders to be layed.

25% time savings

Within the specially-formed concreted shoulders, numerous wirings for communication and pipes for supply and disposal are to be integrated. This tunnel will connect in 2004 the Swiss capital Bern and the economic metropolis of Zurich in less than one hour train journey. The support of the unique construction of the track and tunnel, will allow the train to effortlessly glide through the countryside, even at 200 kilometres per hour. “Apart from the high precision, a considerable time saving of 25 per cent is also achieved using this laser-steered slipforming machine – completely without time-consuming mark posts and obstructing strings!” said Walo Bertschinger construction specialist Heinrich Läuppi.