

The digitalisation of the Koralm Tunnel

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Civil engineering/ Infrastructure



The Koralm Tunnel will significantly shorten train journey times from Graz to Klagenfurt. With BIM and LEAN, work is progressing quickly.

At 32.9km, the Koralm Tunnel is the longest railway tunnel in Austria and the seventh longest in the world. PORR has been working on construction of this crucial connecting section of the 130km-long Koralm Railway since 2013. Using a 240m-long tunnel boring machine the company has bored through every one

of the Koralpe's geological zones. Breakthrough for the south and north tunnels took place in 2018 and 2020 respectively. The Koralm Tunnel is a once-in-a-century project.

Enhanced efficiency with LEAN

PORR has been heavily involved in the Koralm Tunnel since shell construction began. After the breakthroughs came the task of constructing and commissioning 66km of the innovative Slab Track Austria system, which **PORR** carried out as part of a consortium with the Rhomberg Sersa Rail Group. When installing the RBS plate, a type of base plate that is resistant to cracking, there

was a major challenge to overcome: the target of producing 100m of RBS plates per day. With LEAN this target was actually exceeded. The construction site team increased its speed to 125m per day and even managed 278m on one day during the final stretch.

Enhanced transparency with BIM

PORR also secured the follow-up contract, GU2-TA, again as part of a consortium with the Rhomberg Sersa Rail Group. The project includes cable installation work, telecommunications, energy and security technology, mechanical systems and other associated construction services relating to the shell, overhead lines, and railway track. This means that the BTA consortium is responsible for putting the final touches in place before the entire project is handed over to **ÖBB infrastructure AG**. Backed by decades of experience in the operational sector, the consortium will also be focusing on the use of BIM, short for Building Information Modelling.

“As a leader in BIM applications, we are delighted to be able to support ÖBB with a project of this size and complexity” says Clemens Neubauer, head of the BIM department at pde, a subsidiary of **PORR**. BIM enables us to bring together everyone involved in the project so all parties are working on a single digital model. For Günther Strohmaier, overall project lead for the consortium, overall coordinator Daniel Tiefenbrunn and his team at pde Integrale Planung GmbH, and planning coordinator Andreas Bauer, this is crucial. In combination with LEAN, BIM simplifies communication between stakeholders, makes all processes transparent and efficient, and significantly simplifies logistical construction workflows through timely, coordinated planning of all the trades involved. According to Matthias Heimhalt from the Rhomberg Sersa Rail Group, “BIM is being used more and more in railway planning, and the added value is clearly evident. Our goal is to use BIM to support our construction site teams as they carry out the work.”



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Enhanced quality with simulations

Right from the start, the Koralm Tunnel has brought together BIM-based planning and execution in an iterative coordination process. Together these elements have simulated the technical railway infrastructure work in order to ensure the exacting quality standards are met. This process requires agile project management to assess the key performance indicators and come up with appropriate measures for executing the work. Periodic LEAN meetings with the project team ensure that the assumptions made are evaluated in a timely manner.

All BIM applications are implemented using agile project management approaches and methods by the 25-strong team, with the aid of digital tools.

The portfolio of services also ranges from internal resource planning to project control, an aspect involving close, shoulder-to-shoulder collaboration. The model-based working methods and agile project management improve the quality of planning and lead to an optimisation of logistical construction processes, even before the pre-construction lots are taken over to be set up as construction sites. The first signs of the success of these working methods are already evident: Based on the prioritised sample cross-cuts set out in the preliminary stages, technical facts have been discussed while simultaneously being integrated three-dimensionally and augmented.

The digital Koralm Tunnel



Enhanced value for all

“End-to-end digitalisation of processes from planning and project execution through to maintenance management and operations is an important objective for ÖBB. In order to take full advantage of the benefits of this kind of digitalisation, BIM is being applied as an integrative constituent of planning and execution in the large-scale Koralm Tunnel project,” says chartered engineer, Dr Klaus Schneider, the project lead responsible for overall coordination of the Koralm Railway at [ÖBB-Infrastruktur AG](#). The plan is to make the model information generated and processed as part of the preparation phase available

in the application phase and during operation as well. The requirements of implementing the BIM and the associated processes will contribute to generating an as-built model that contains all of the content-related data needed to assess the condition comprehensively.

The Koralm Tunnel is a ground-breaking success. Not just for [PORR](#), the [Rhombberg Sersa Rail Group](#) and [ÖBB](#). But also, and most importantly, for all those people who will be able to get from A to B faster and more sustainably in future.

Facts and figures

Project type	Railway construction/technology/fittings
Client	ÖBB Infrastructure AG
Contractor	ARGE KAT GU2 Rhombberg - PORR
Construction period	07/2021 - 10/2025
Trades to be coordinated	7 trades
Level of geometry	approx. 800 pieces
Level of information	> 100,000 pieces

More info

Technical background information on construction section 3 of the Koralm Tunnel can be found [here](#).

