Trafficable track covering for slab track systems

Solid foundation for greater safety in railway tunnels

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RHOMBERG SERSA RAIL GROUP

Ensuring safety on your railway line

Railway tunnels must be passable for road vehicles – a real challenge for railway operators. ABG's finally provides the perfect trafficability solution for slab track systems.

The requirements

The track covering must ensure that emergency vehicles can enter and pass through safely, while at the same time withstanding the pressure and suction forces of train traffic on high-speed lines. In addition, grounding requirements must be met and maintenance work on the track must be ensured. The function of the signalling equipment must not be restricted.

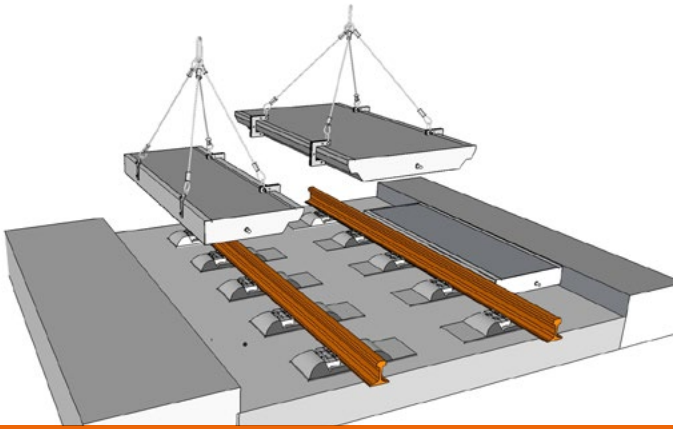
The solution

ABG's in-situ concrete system, which can be adapted to the location and is flexible in its design, is measured using state-of-the-art laser scanning technology.
Lightweight, stackable sheet steel formwork forms the frame, which is optimally secured against slipping. Before concreting, a separation layer is laid on the track slabs as a to ensure that the trafficability slabs can be lifted later on.

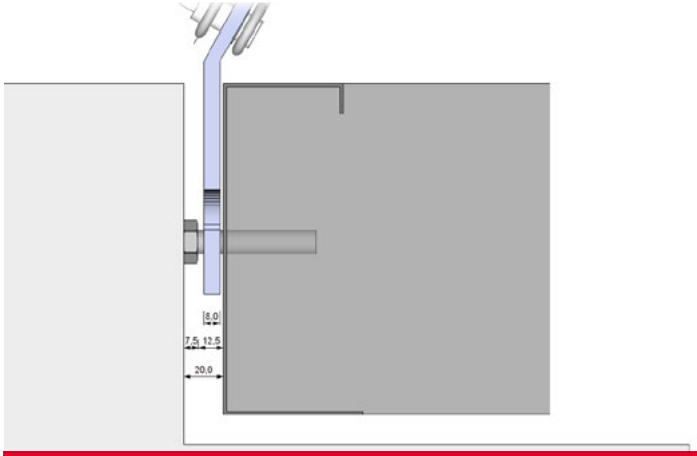
Special features

The system allows the gap between the rail and the slab to be „tapered", enabling access to the rail fastenings and allowing non-rail vehicles to drive over the slab (maximum gap to the rail: 15 centimetres).

- The formwork frames of the edge elements were designed to be adjustable in width in order to accommodate tolerances at the shoulders.
- In order to reliably prevent the elements from shifting on inclined sections of track, a newly developed, easily adjustable coupling system is used to connect the elements to each other.



In order to maintain the track, individual track plates can be lifted and access to the track can be exposed.



Bottleneck edge joint (cross-section): The correct dimensions between the slab (right) and the shoulder (left) or rail were determined for the first time using laser scanning. This ensures that the hooks (blue) can later lift the track covering without any problems.

Scanner with reference point

The laser scan

In order to reliably determine the necessary adjustment ranges of the formwork frames, it is essential to measure the internal geometry of the track. Advantages of laser scans::

- Comprehensive, millimetre-precise recording of the entire track thanks to scan point cloud, odometer data and inertial measurement.
- The steel frames for the individual elements of the track covering can be perfectly adjusted, leading to significant efficiency gains.
- Measurement runs of up to 2 km/h are possible.
- Results are available after only one day of evaluation and automatically include five control points between each two sleepers (or pairs of fasteningsplu), enabling a much more comprehensive inspection.
- The control points are calculated as the average value from an area of approximately 4 square decimetres, which increases the informative value compared to the selective information provided by traditional survey methods. The result is therefore more representative of the area as a whole than a random selective result on rough surfaces.

The advantages at a glance

The requirements for high-speed lines and the numerous regulations of railway operators are fully met.

- Edge protection of the elements: No sharp-edged concrete parts are used, which means that subsequent work, such as fitting the tunnel with electrotechnical equipment, can be carried out without any problems. This optimises the installation process.
- Flexible adaptation of the elements: The elements can be easily adapted for various installations, cable routing and empty conduits (drainage shafts, axle counters, hot axle box detectors (HOA), earthing connections, etc.).
- Sheet metal frames as permanent formwork enable flexible adaptation of the geometry.
- The tapered elements meet the requirements for maintenance (accessibility of rail fastenings) as well as for rescue and firefighting services (maximum gap to the rail: 15 centimetres).
- Works for all conventional slab track systems, as the system rests on the rail seat shoulders. There is no need for the costly manufacture or procurement of special sleeper or slab types.
- The side elements are adjustable in height and width. This allows for compensation of structural tolerances in the shoulders and ensures a constant gap dimension. Tripping hazards are eliminated.
- Solid, flat support for the elements: they lie absolutely securely, eliminating any possibility of „wobbling“.
- Instead of stretch film, dimpled film can be used in areas affected by drag water, such as portals, to enable problem-free water drainage.
- Thanks to the frames‘ excellent stackability, the material requires very little space in the intermediate storage areas of the construction site.
- The low weight of the frames ensures easy handling.
- Even switches can be covered without any problems using specially developed elements as standard.
- No reinforcement is needed.
- Easy to lift with crane gear and slings.
- Laser scanning enables faster, more accurate results.

Overall, railway operators benefit from easy installation, a wide range of adaptation options for various fixtures, a robust, renovation-free design and, ultimately, high cost-effectiveness.

The steel sheet frames can be easily and flexibly adapted to various fixtures, cable ducts and empty conduits.

The trafficable slabs can support rescue vehicles with a total weight of 16 tonnes and an axle load of 10 tonnes or a wheel load of 5 tonnes.

The supplier: ABG – ARGE Befahrbares Gleis

Rhomberg Sersa Bahntechnik

The Rhomberg Sersa Rail Group was formed in 2012 from the merger of the Swiss Sersa Group with the Austrian Rhomberg Bahntechnik. Since then, the railway technology company has evolved into an international full-service provider with an almost comprehensive range of services in the areas of railway construction, infrastructure and service. Customers include local and long-distance railways, freight lines as well as private infrastructures.

The Rhomberg Sersa Rail Group pursues the vision of establishing rail as the leading mobility solution of the future. To achieve this, it relies on the opportunities offered by technological developments and digitalisation as well as on partnerships.

Learn more: rhomberg-sersa.com

Ed. Züblin AG

Züblin is a leading German construction company based in Stuttgart and part of the STRABAG Group. For over 125 years, the company has been implementing challenging projects in building construction and civil engineering and is considered the market leader in Germany. Its portfolio also includes turnkey construction, specialised civil engineering and building maintenance.

With its TEAMCONCEPT® model, Züblin promotes partnership-based construction to ensure transparency and adherence to deadlines. Digital methods such as BIM 5D optimise construction processes and set new standards in the industry. The company also pursues ambitious sustainability goals and aims to be climate neutral by 2040. As part of STRABAG SE, Züblin benefits from the strong European network of a technology group for construction services.

Learn more: zueblin.de

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