

DB existing network measures for route 5501, Ingolstadt-München, km 43.5 to km 79.0

The planned upgrading of the line on the Ingolstadt – Munich track upgrade section between Peterhausen and Ingolstadt from 39.9 km - 79.0 km will achieve a speed increase to 190 km/h and 160 km/h respectively. In order to ensure the speed increase, individual measures must be implemented via the above project while the network remains in operation.

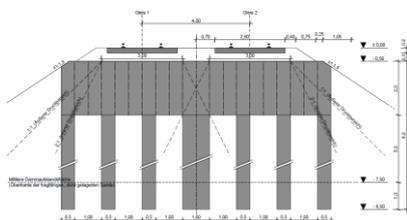
These are:

- New rail overpass, Führholzener Strasse,
- New rail overpass, Dörfel,
- New rail overpass, Thannbergstrasse,
- Embankment remediation km 68.4 - 69.1 (FMI, MIP or RSV methods)
- Embankment remediation km 69.8 - 70.6 (FMI method)
- GOS Ingolstadt
- Track renewal km 62.1 - 63.7
- Track renewal without rail, km 66.8 - 68.4
- Track renewal km 43.47 - 40.05
- IH Pfaffenhofen network
- IH network S&S Pfaffenhofen
- Track and points renewal, Munich - Pfaffenhofen (MPF) freight yard

Embankment remediation, km 69.8 – km 69.6

Increased track geometry changes (subsidence) in the embankment section were being observed from 69.8 km to 70.6 km (embankment height up to 6.0 m) during operation. This is caused by loosely or very loosely bedded sands and silts at depths of 2.0 to 4.0 m below top of rail level. In order to ensure the stability of the embankment, the line speed had to be reduced to 120 km/h.

For this reason, DB PB was commissioned to carry out embankment remediation and the production of the control profile with proof of embankment slope stability.



Milling/blending/injection frame with fins for embankment remediation



240 meter-long track renewal train PM 1000 URM

After completion of the preliminary design, the milling/blending/injection method was determined as the most economically advantageous variant that complied with all conditions.

A milling/blending/injection frame of approximately 4.0 meters deep and 10.0 meters wide was made. This was then elevated on fins of 0.5 m wide and embedded into stable ground at a depth of approximately 0.5 m.

In addition to this method, all the advantages and disadvantages of the vibrated stones columns method and the mixed-in-place method offered by Bauer Spezialtiefbau were also examined in detail.

Track renewal without rail, Ingolstadt

The Ingolstadt track renewal without rail project is to be accomplished by means of a 240-meter-long track renewal train using assembly line techniques (see the "Track renewal train" photo above). The 30-cm thick formation protective layer (FPL), including geomembrane, was re-laid and the ballast replaced in mechanically in a single pass. The track renewal train also performs tamping and leveling work over approximately 500 meters of track per shift.

sfirion AG was responsible for project management in each of the measures described above in work phases 2-8.

Client

DB Netz AG

Contracting authority

DB ProjektBau GmbH
RB Süd (Nuremberg)

Reference person

Dipl.-Ing. Thomas Thürer
DB ProjektBau Project Manager

Planning and implementation

2013/04 – 2015/08

Construction cost

approximately EUR 40 million

Contract value

approximately EUR 200,000

Services provided by sfirion AG

Project management

- Organization and coordination
- Deadline and cost control
- Contract and change order management
- Planning coordination

Work phases:

LPh 2-8