

E65 railway line substructure reinforcement

Szymankowo

On the 1 km section of the E65 railway line in the Szymankow area, where there were numerous deformations of the tracks in the past, Keller reinforced the trackbed using the DSM method.



The project

As part of the modernization of the E65 Warsaw-Gdynia railway line on the Szymankowo-Lisewo section, the investor (PLK) planned to strengthen and stabilize the trackbed using the classic cement slurry injection method to adapt the route to increased train speeds up to 160 km/h.

The challenge

The challenge for Keller was the short time of the works and the adaptation of the soil reinforcement technology to the different than those in the tender documentation soil conditions.

The solution

Since in Keller's study soft plastic dust and organic muds were found in the trackbed, instead of the expected loose sands, the classic low-pressure injection of cement slurry planned by the Contracting Authority in the tender project could not be applied effectively. Keller designed and executed a deep injection of cement slurry supported by mechanical mixing of weak soil with slurry with DSM technology.

To increase productivity and shorten the time of work, the DSM twin-axis mixing with a double innovative slurry was used for the first time. Lengths, diameters and arrangement of DSM columns were adjusted to the load and soil conditions along the reinforced section of the track. The average length of the injection columns was approx. 4.6 m (from min. 3.0 m to the max. 7.0 m), and the total length of the columns was approx. 47 km with a total volume of 6,000 m³ of cement and soil.

Project facts

Owner(s)

PKP PLK

Keller business unit(s)

Keller Polska

Main contractor(s)

PNI

Solutions

Re-levelling structures

Markets

Infrastructure

Techniques

Wet soil mixing