

## Pomeranian Metropolitan Railway, Stage I

Gdańsk

From June to October 2013, Keller Polska has completed the foundation of the engineering structures of the Pomeranian Metropolitan Railway - a 19.5 km long railway line which connected the Lech Walesa Airport in Gdansk with the Tricity, providing easy access to transport for over a million inhabitants of the Tricity agglomeration.



### The project

The construction of 17 out of 40 engineering structures of the Pomeranian Metropolitan Railway (Stage I - the revitalisation of the Kokoszkowska Railway) required deep foundation or reinforcement of the ground. The selection of appropriate foundation technologies allowed to meet the design requirements.

## The challenge

The route of the Pomeranian Metropolitan Railway, overcoming significant denivelations, leads through areas with very diverse terrain. Land conditions within the investment were very diverse. In most cases, mineral soils were found in the subsoil of the structure, and locally organic soils were found. The route on a significant section runs on an old railway embankment, built mainly of equatorial sands. Due to the high requirements placed on the substructure, the foundation of the viaducts in the railway line required the transfer of heavy loads. The greatest challenge was the design and execution of the foundation of a single-span WK-11 flyover with a span of 80 m.

## The solution

The foundations of most of the viaducts were laid on CFA piles of 800 mm diameter. In total, 15,000 m of these piles were constructed under 7 objects. 3 objects were made on the ground reinforced with DSM columns of 1000 mm diameter (3800 m). Two more structures were erected on 40x40 cm (540 m) prefabricated driven piles. After many analyses, the WK-11 object was founded on foundations made of diaphragm walls and 80 cm wide barettes with a total area of about 2000 m<sup>2</sup>.

## Project facts

### Owner(s)

Miasto Gdańsk

### Keller business unit(s)

Keller Polska

### Main contractor(s)

Budimex

### Solutions

Heavy foundations

Bearing capacity / settlement control

### Markets

Infrastructure

### Techniques

CFA piles (auger cast)

Wet soil mixing

Driven precast piles

Diaphragm walls/barrettes