

## LOTOS Refinery EFRA U&O Programme

Gdańsk

The EFRA U&O project required designing and execution of comprehensive geotechnical works alongside with the necessary preparatory, excavation and installation works.



### The project

The EFRA project is a continuation of the earlier investment Programme 10+ of the expansion and modernization of oil processing technology, which will allow supplying the market with approximately 900 thousand tons of additional petroleum products annually. At the request of LOTOS Group, Keller performed piling works for all facilities of EFRA installation.

## The challenge

The challenge was to work with the strict requirements of the HSE and, in the case of micropiles and Soilcrete high-pressure injection, near active installations. The high level of HSE and the involvement of Keller's employees allowed to meet the restrictive requirements and to complete the works on time, without any potentially dangerous incident, which resulted in obtaining the HSE award for Keller's work manager.

## The solution

Keller has designed and executed piling and ground reinforcement for several installations, including GPZ, Oxygenation Plant Building, new Flyover 6-7 (CFA piles L=12-26 m), tank 2080 (SDP/CFA piles L=10-11 m), existing Flyover 6-7 (Soilcrete), Flyover 2700 / culvert at tank field 2080 (micro piles, L=12-22 m) and many other smaller objects on micro piles between existing installations. Also, the first bridge object in the history of Keller Poland was constructed, and it provided access to the new tanks. Using Soilcrete high-pressure injection, 63 foundations of the existing flyover were reinforced, which allowed to eliminate troublesome earthworks and reinforced concrete works in narrow-space excavations about 4 m deep and to avoid widening the existing foundations in the bottom of the excavation.

## Project facts

### Owner(s)

Lotos Group

### Keller business unit(s)

Keller NEE

### Main contractor(s)

Keller Polska

### Solutions

Heavy foundations

Underpinning

Bearing capacity / settlement control

### Markets

Industrial

### Techniques

CFA piles (auger cast)

Jet grouting (Soilcrete®)

Micropiles