

# LOADTEST O-Cell® Technology at Weida Bridge, Germany



Project: **Weidatalbrücke**

Location: Esperstedt, Germany

Client: DEGES

Geotechnical engineers: ARCADIS Consult GmbH

Foundation Contractor: Züblin Spezialtiefbau GmbH

Loadtest office Germany: Scanrock GmbH

**Project Description:** The project, BAB A 38, Göttingen – Halle Süd (A143) BW 4616/06A is located over the Weidatalbrücke, Esperstedt, Germany and consists of a 435m long box girder bridge of seven spans, the longest of which is 158 m. At a cost of 16.8 million Euros, the bridge is located within a nature reserve and therefore in an environmentally sensitive area.



Installation of O-cells and pressure cell on the bottom of the carrying frame

The design for the foundations of this new motorway bridge required verification and the Bi-directional testing methods were selected as it provided the most environmentally friendly solution.

Tests were performed on two 1200mm diameter piles approximately 27 m deep fitted with a multilevel O-cell arrangement mounted in a purpose built carrying frame rather than a conventional reinforcing cage. Two 540mm diameter O-cells were installed in each carrying frame with a pile-tip pressure cell mounted at the bottom of each test pile. The lower O-cell was 2.4m above the pile tip and at the start of the limestone strata and the second O-cell level set at 9.4 m above the pile toe.



Installation of the O-cells on the steel carrying frame into the pile bore

Using to advantage a feature unique to multi-level bi-directional tests, the load was applied in stages, mobilising different portions of the test pile. The information provided skin friction values for specific zones along the pile shaft and unit end bearing information. The load tests mobilized 32 MN and 35.2 MN combined skin friction and end bearing for the two test piles. The pile-tip pressure cells allowed the end bearing to be separated from the skin friction.



Lifting of the steel frame showing two O-cells at two levels

Bi-directional load testing using the Osterberg Cell proved to be the most environmentally friendly solution for testing in this highly sensitive location. The alternative traditional top-down testing would have meant transporting and erecting kentledge or installing extra anchor piles and very large steel beams to create a reaction system. Instead, only the test piles had to be constructed, and truck movements for pile spoil removal and concrete deliveries were all greatly reduced.



Underside of completed bridge

source: [www.uni-kassel.de](http://www.uni-kassel.de)

