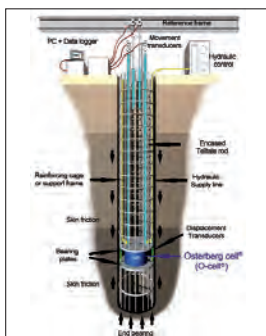


Vidin – Calafat Bridge

Project	Vidin – Calafat Bridge
Location	Vidin – Calafat, Danube River, Border between Bulgaria and Romania EGIS Route / EGIS Géotechnique
Client	Fomento de Construcciones y Contratas (FCC), Bulgarian Branch
Period	July 2008 – September 2009
Project Description	<i>Purpose</i>



Schematic of O-Cell Test

The Vidin-Calafat-Bridge is a newly planned road and railroad bridge linking the cities of Vidin, Bulgaria and Calafat, Romania. It will be the second bridge on the shared section of the Danube between Romania and Bulgaria. The bridge is to be built by the Spanish company Fomento de Construcciones y Contratas (FCC), and the cost is projected to be \$160 million. Construction officially began on May 13, 2007 in Vidin and is planned to finish by 2010. The bridge will be part of Pan-European corridor IV (Dresden–Istanbul) and will measure 1,971 meters in length. The construction of this bridge is one of the major infrastructural projects in this region. These development corridors are distinct from the Trans-European transport networks, which include all major established routes in the European Union, although there are proposals to combine the two systems, since most of the involved countries now are members of the EU.

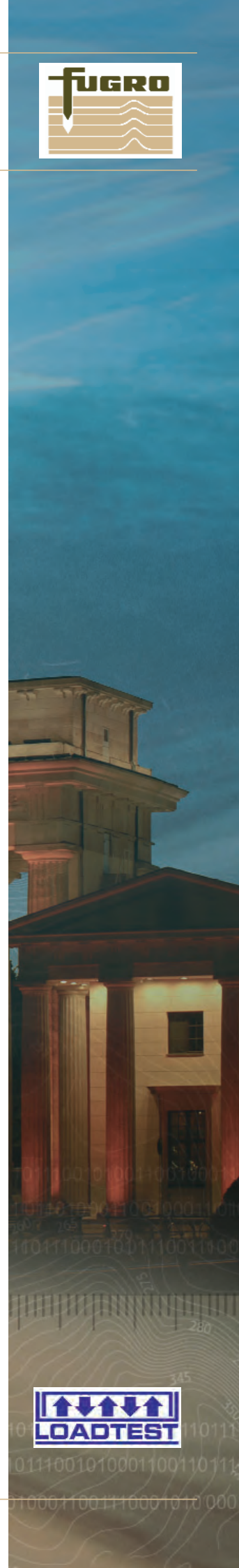


CPT truck and bridge construction site

During the construction of the bridge FUGRO was asked to provide geotechnical services to assist FCC and its consultants to optimize the foundation design and to measure the capacity of the installed foundation piles for the bridge foundations.

Realization

Between July 2008 and September 2009 Fugro Loadtest performed 9 bi-directional static load tests using the O cell® bi-directional testing method. Preliminary piles of 1200 mm diameter were tested to determine their geotechnical behavior and evaluate the soil parameters used in the pile design on both the Bulgarian and the Romanian sides of the river some of which were 65–68 m deep and tested to 24 MN. Testing of the 2000 mm working piles to similar depths and loads have been carried





CPT interior with in-situ vane shear testing equipment

out, with more tests planned before completion of the piling program. The working piles are grouted after the test and incorporated into the bridge foundations.

Since the information from the initial site investigation campaign did not provided sufficient information about the subsoil conditions, especially the settlement behavior to allow the designers to estimate the duration of the consolidation and settlement of the embankments FUGRO CONSULT GMBH was asked to perform 38 Piezo-Cone Penetration Tests, 25 Dissipation Tests up to 5 h duration and 95 In-Situ Vane Shear Tests along the proposed 10 km long bridge approach.

The investigations were performed in order to obtain information of the subsurface soil conditions and the settlement behavior along the proposed combined road and railroad bridge. The results from Fugro's CPT site investigation campaign as well as available data from laboratory test results and test fields were used for precise time-settlement calculations of the subsoil. This was the basis for an optimized schedule for the proposed embankment construction activities.

Our services helped the designers and geotechnical engineers to reduce the construction costs and to achieve confidence in the design and the built piles.

Scope of work / Overview

- 9 bi-directional pile load tests using the O-cell bi-directional technology up to 26 MN
- 38 CPT's with pore water pressure measurement
- 25 Dissipation Tests up to 5 h
- 95 In-Situ Vane Shear Tests
- Geotechnical Calculations, Recommendations and Consultancy



Installation of O-cell test pile

FUGRO CONSULT GMBH
 Wolfener Strasse 36 V
 12681 Berlin, Germany
 Tel. +49-(0)30-93 651 364
 e-mail fugro@fugro.de
www.fugro.de

FUGRO LOADTEST LTD
 14 Scotts Avenue, Sunbury Upon Thames,
 Middlesex, TW16 7HZ, United Kingdom
 Tel. +44-(0)1932-784807
 e-mail Europe_info@loadtest.com
www.loadtest.com

FUGRO CONSULT GmbH and Fugro LOADTEST Ltd are members of the Fugro Group, with offices throughout the world.