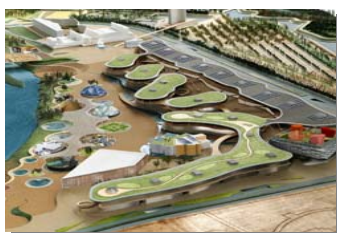


Project	<b>The Bridge Pavilion</b>
Location	International Exposition 2008, Zaragoza, Spain
Contractor	Dragados S.A.
Foundation Contractor	Terrabauer S.A.
Geotechnical Co.	Ove Arup & Partners
Period	Summer 2006
Project Description	



Expo 2008, aerial view



Bi-directional test in progress with steel



Installation of O-cell arrangement within pile cage

Zaragoza is Spain's fifth largest city with a current population exceeding 650,000 inhabitants. As host of Expo 2008, this project became a centerpiece of the exposition hoping to attract tourism receipts of over a thousand million euros and the creation of about 9,500 jobs.

Situated on an artificial island on the River Ebro, the test site is one side of a very prestigious and technically challenging pedestrian bridge project. Architect Zaha Hadid and Arup partnered to design and oversee construction of this unique bridge.

This 275m long bridge held one of five pavilions for the exhibition and is shaped like a fish. It has 7000m<sup>2</sup> of exhibition space on 2 floors. The bridge is actually designed to move hydro-statically and the scale-like windows shimmer in the sunshine.

In order to make the design work, the piled foundations support a substantial load in relatively poor soils, requiring some of the largest piles ever constructed in Spain. One test exceeded 40 MN on a working pile of 2000mm diameter. Two 670mm diameter O-cells were sandwiched between bearing plates and attached to the reinforcement cage, then cast into the pile. The O-cells were located approximately 9.5m above the toe of the 63 m long pile bored under bentonite slurry.

Aside from the large test load requirements, utilizing the O-cell method negated anchor piles (which would have proved both uneconomical and difficult to install within the confines of the site) or kentledge loading (which would have proved impossible to erect on the artificial island).

Linear Vibrating Wire Displacement Transducers (LVWDT's) are used at the O-cell level to measure expansion. Close monitoring of the expansion was needed to ensure that the working pile was not loaded to excessive movements.

Geokon Vibrating wire strain gauges were used along the pile shaft to monitor strain which assists in deducing unit skin friction.

A combined bi-directional loading of over 40MN was applied, with displacements of 20mm in the downward direction and 8mm upwards.

The test succeeded in mobilising the required 20 MN in each direction providing the Client with confidence that the pile design was more than sufficient for the loads required. In keeping with the theme of the project, the O-cells were pressurised using water.



The Pavilion Bridge

Source: [bdonline.co.uk](http://bdonline.co.uk)