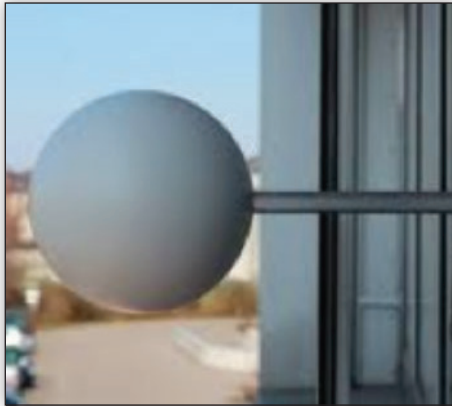# SITE SURVEY LASER SCANNING

» LIVE RECONSTRUCTION OF A DIGITAL 3D MODEL OF LONDON BRIDGE

3D Laser scanning has been a fundamental part of the design process for the London Bridge project. In simple terms a laser scanner can take multiple scans from any site quickly – scanning up to one million points of data per second. In the office, the resulting point clouds can be modelled in various software packages such as Microstation, Rhinoceros, Pointools or AutoCad. The result is a highly detailed full-scale 3D model that has many uses for the end user.

ARCH SCANNING

In 2010, at the early stages of the London Bridge project the whole of the site was 3D laser scanned and modelled. Most of the arches were tenanted with various businesses such as Gyms, restaurants, nightclubs etc. This meant that during initial scanning, many of the arches were furnished; covering up the structural elements, meaning that these elements were not able to be scanned or modelled. This meant that around half of the original arches needed re-scanning.

Costain started to take possession of arches in early 2012 and a Laser scanner was purchased. Laser scan surveys were taken of the newly exposed arch structures. This data was then re-modelled and issued to Hyder WSP / Grimshaw to update their designs.

INTERFACE SCANNING

The station development involves a large part of the old station to be demolished and re-built. This means there are several areas where the new construction will have a direct interface with existing buildings and retained parts of the station. In particular, The Shard is a major interface to address.

To aid the design work around The Shard, 3D laser scans have been carried out in the area during the last 6 months. Detailed surface models have been generated and issued to the design teams.

Detailed information was required where the demolition line meets the heritage facade on St Thomas street. Grimshaw architects wanted to know the arrangement of the wall brick by brick, joint by joint so that the wall could be methodically retained at the interface. The laser scanner was used to gather detailed information of this interface line, this data was then modelled.

LASER SCAN MONITORING

With significant movement being recorded in arches E55-E57 from automated survey monitoring schemes, an exercise was carried out to see if the laser scanner could detect a similar movement; this would analyse and prove the integrity of the monitoring data.

Having scanned the Arches in December 2012 before any movement had taken place, it was a simple task to re-scan the arch using the same survey grid and then compare the two scan clouds. A big advantage of comparing laser scan clouds is that deformation is able to be measured holistically, whereas with the original monitoring scheme we were limited to show displacement only.

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