Zoo Elephant House (Switzerland)

Project description

Zurich city's zoo has constructed a new park for its elephants, which opened in 2014. The 10,000 m² park includes a large housing unit consisting primarily of a wooden roof shell – the largest self-supporting wooden roof structure in Switzerland. A hot, humid environment will be maintained inside the structure, as prevailing in the natural habitat of the Indian elephant, whereas the outside shell needs to withstand the seasonally changing weather conditions of Switzerland.

Due to the roof's unusual design in terms of size, shape, and construction material, and the high humidity of the air underneath, it was decided to install a permanent automated monitoring system to provide continuous monitoring of the roof structure's anchorages and moisture levels.

mageba scope

mageba developed a monitoring plan for this demanding task. 24 humidity sensors, distributed over the entire roof surface, measure the moisture content of the roof's timber, and the anchor forces arising in the roof's foundations are also measured. The effect of humidity is correlated to the structure in terms of stress, creep, shrinkage and other deformations, with possible thrust/traction in the anchorage area.

The measured values are displayed in real time on the system's web interface. The system also includes an alarm feature, offering automatic notification of exceeding of pre-defined limits in any parameters.

Highlights & facts

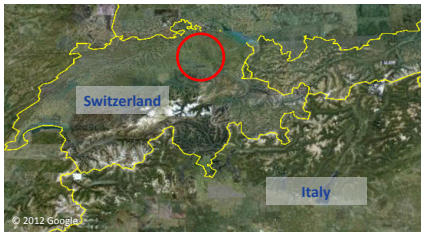
mageba products:

Type:	ROBO®CONTROL permanent SHM system
Features:	Anchorage force sensors, air and structural temperature and humidity sensors
Installed:	2013

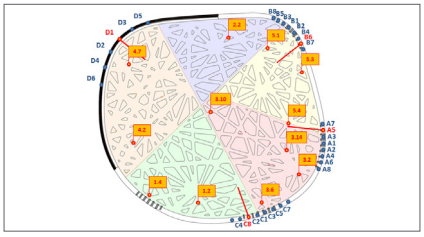
Structure:

City:	Zurich
Country:	Switzerland
Built:	2013
Type:	Wooden pavilion
Span:	110 m
Owner:	Zurich Zoo
Architect:	Markus Schietsch
Engineer:	Walt & Galmarini

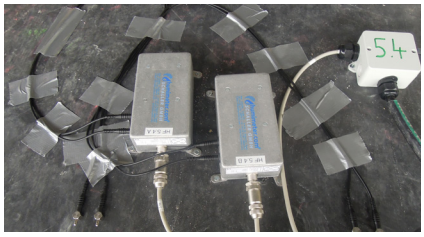
Zurich Zoo is located near Zurich city center



Layout of sensors on the wooden roof



Humidity sensors installed on the underside of the roof



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