



Restoration of the arcade of Bojes Patios

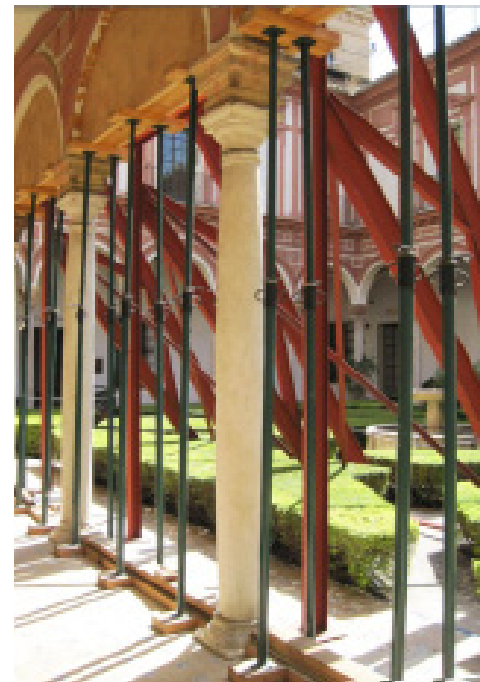
Sevilla

CLIENT	CEDEX. Ministry of Culture
PROJECT DATE	2009/2010
LOCATION	San Fernando, Spain
FIELD OF ACTION	Research & Restoration projects

Bojes Patio is one of the cloisters of the Museum of Fine Arts in Seville, built in 1602, by Juan de Oviedo.

The cymatium (abacus standing on the capital) which are located over the 24 marble columns, are made of ostionera stone, material also founded in the Cathedral which involves lot of durable problems. Over the cymatium, arches of 2.85 m span are built, brick masonry spandrel walls of 0.32 m thick, higher wall of 0.55 m height, also made of brick and the roof and below cover plants. In the galleries, which are located just over the arches by twos, hang the works of the masters of Seville School of Painting.

Many of these cymatium, are considerable damaged; specifically in six located on the north face undergo an intense weathering and one of the elements is fractured by two vertical planes.



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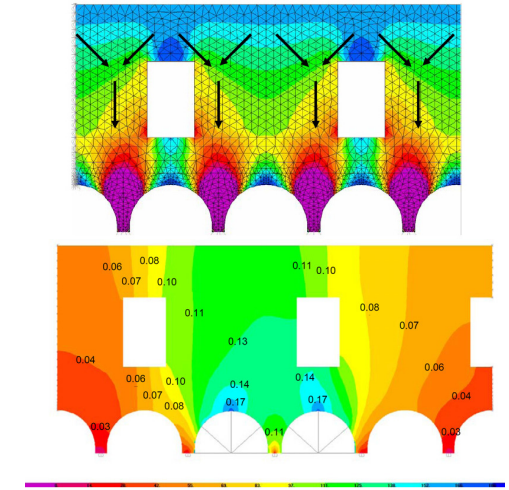
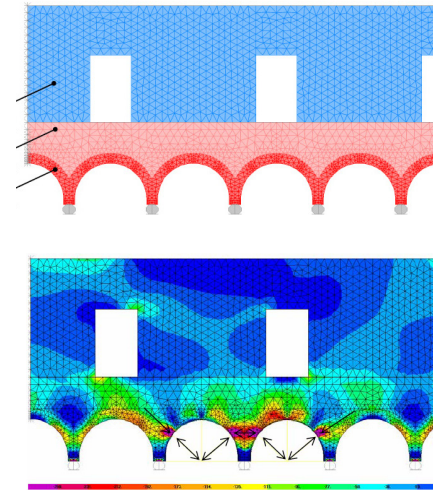
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The vertical load resting on each cymatium is about 200 kN, which suppose compression stresses of 2.2 N / mm^2 and pulling stresses of 0.27 N / mm^2 in the stone. These values are very moderate compared to the characteristics of the intact stone, but high of compared to the characteristics of the ostonera when it is strongly weathered.



CEDEX asked INES to do a diagnostic study and different proposals of action. As a result of this works, it was concluded the need to replace the 6 most affected cymatium; as well as an active shoring system and a replacement procedure were sized.

The Ministry of Culture required INES then the Construction Management of the Emergency Project awarded to the company Betazul. Its aim is to replace the current shoring with a new more effective one, in order to allow applying vertical forces, which unload the cymatium before its replacement.

The following works were carried out:

- Characterization test and diagnosis of the stone damage.
- Tension analysis of the masonries during the shoring process and establishment of

