WORKSHOP

TILE VAULTS

11-15.06.18

Contact and info:
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Tile vaults are built with one or more layers of thin bricks, laid "flat", joined together by their edge. During the construction, stability is achieved by using plaster mortar, and no centerings are needed. The advantages of this technique are the savings in auxiliary means, lighter structure, with the consequent reduction of thrust and buttressing system, and a faster rate of the construction.
The aim of the workshop is to get familiar with this traditional technique, specially employed in the Mediterranean area. It is a very simple and economical technique that has been revitalized over the last few years for intervention in old buildings, but also for the construction of new ones.

9:00-17:30
Construction:
Entrance of Building 2A/2B
BTU Cottbus-Senftenberg,
Campus Cottbus
Lectures
Classroom B.1.06, Building 2B

Lectures
11.06.2018
9:00 Presentation of the workshop
9:15 Guest Lecture. Carlos Martín.
The experience of a vault builder
13:30: Student's presentations
(Building 2D 109)
12.06.2018
9:00 Lecture. Paula Fuentes. *Structural behaviour of arches and vaults*
13.06.2018
9:00 Guest Lecture. Ignacio Gil.
Guastavino in America

In cooperation with:
Carlos Martín
(Mason, Manager of CREA)
Ignacio Javier Gil Crespo
(Dr. Architect)

GRK 1913
Graduiertenkolleg
Kulturelle und technische Werte historischer Bauten
DFG

b-tu
Brandenburgische Technische Universität Cottbus - Senftenberg

Placo SAINT-GOBAIN

Conservación y Restauración de Yesos Artesanos
CReA

Fakultät Architektur, Bauingenieurwesen und Stadtplanung
Lehrstuhl Bautechnikgeschichte und Tragwerkserhaltung
Prof. Dr.-Ing. Werner Lorenz

Brandenburgische
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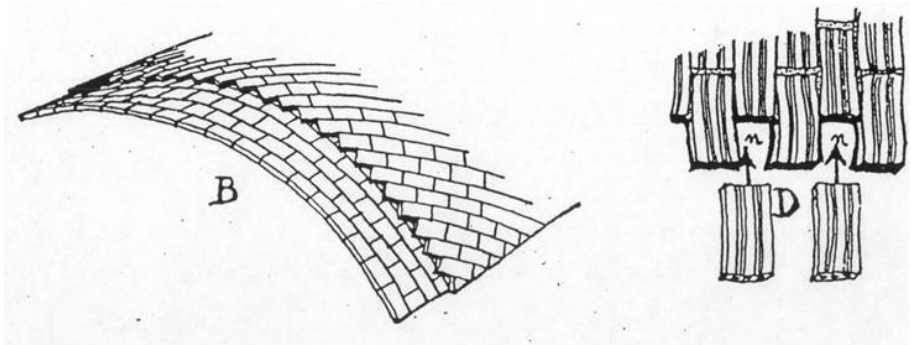
Cottbus

Workhosp
TILE VAULTS: A TRADITION WITH FUTURE

Tile vaults are built without centering, with one or more layers of thin bricks, placed “flat”, joined together by their edge. The bricks are built up as an arch or concentrically until the vault is completed. During the construction, stability is achieved by using plaster mortar. Plaster mortar sets in a short amount of time, allowing a vault to be built without centering. The advantages of this technique are the savings in auxiliary means, its lightness, with the consequent reduction of thrust and buttressing system, and a faster rate of the construction. Nowadays, a new interest on vaults is growing, not only for the restoration of old buildings, but also for the construction of new ones.

The aim of the workshop is to get familiar with this traditional technique, specially employed in the Mediterranean area. It is a very simple and economical technique that has been revitalized over the last few years for intervention in old buildings, but also for the construction of new ones.

The participants will have the opportunity to build a real vault, learning from a specialist mason, understanding the use of the materials and the construction process.



Left: mason building a tile vault in Spain, ca.1960; Right: Mapungubwe Research Centre, South Africa (Architect: Peter Rich)

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Dates*

Day 1-11.06.2018
9:00 Presentation of the workshop
9:15 Guest Lecture. Carlos Martín. *The experience of a vault builder*
10:00-12:30 Construction of arches
12:30-13:30 Pause
13:30-17:30 Presentation of the individual research (by the master and bachelor students) and discussion (10 min presentation/group)

Day 2-12.06.2018
9:00 Lecture. Paula Fuentes. *Structural behaviour of arches and vaults*
10:00-12:30 Construction of the vault and the dome
12:30-13:30 Pause
13:30-15:00 Collapse tests of the arches and cleaning up
15:00-17:30 Construction of the vault and the dome

Day 3-13.06.2018
9:00 Guest Lecture. Ignacio Gil. *Guastavino in America*
10:00-12:30 Construction of the vault and the dome
12:30-13:30 Pause
13:30-17:30 Construction of the vault and the dome

Day 4-14.06.2018
9:00-12:30 Construction of the vault and the dome
12:30-13:30 Pause
13:30-17:30 Construction of the vault and the dome

Day 5-15.06.2018
9:00-12:30 Finish the vault and the dome
13:30 Collapse tests of the vault and the dome, followed by clean-up party

***Please note that the schedule is illustrative, as the works may go faster or slower depending on the abilities of the apprentices**

In cooperation with: Carlos Martín, vault builder and Ignacio Javier Gil Crespo, architect

The workshop will take place in the main entrance of buildings 2A/2B

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Previous workshops

With growing interest in tile vaults, there have been different workshops where the theory and practice have been taught.

In 2010 Artifex Balear organized the international workshop *Stonemasonry in Context*. They built tile vaults with "marés", a very soft stone in Mallorca, that can be cut in very thin pieces, and used as bricks.

In 2013 there was an International Festival on Art and Construction (IFAC) where a tile vault was built. Also in 2013, in SmartGeometry, in London, Carlos Martín built a tile vault with a complex geometry.

In the ETH in Zurich, Phillipe Block has built very complex tile vaults. The form has been designed with the program Rhinovault.

Since 2013, tile vaults are regularly taught in a workshop at the School of Architecture of the Polytechnic University of Madrid.

In 2014 the team of the Polytechnic University of Madrid made a workshop in Ambato (Ecuador).

Collapse test of a segmental arch (Madrid 2014)

Collapse test of a "bóveda de cuatro puntos" (Madrid 2014)

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Cross-vault (Madrid 2016)

Construction of a dome r=2,5 m (Madrid 2015)

Tile vault designed and built by the students (Madrid 2015)

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"Load test" of a ribbed vault (Madrid 2016)

More info about previous workshops: https://bovedastabicadas.wordpress.com/

About the lecturer:

Paula Fuentes

Architect at the Polytechnic University of Madrid, Master in Building Structures. 2013, PhD Dissertation: Bóvedas de arcos entrecruzados entre los siglos X y XVI. Geometría, construcción y estabilidad (Crossed-arch vaults between 10th and 16th centuries. Geometry, construction and structural behaviour). 2005–2007, work in Architecture Office. 2010–2015, Assistant Lecturer at the School of Architecture, Department of Building Structures, Polytechnic University of Madrid. 2015–2016, freelance work making technical reports about historical buildings. Since October 2016 Research Associate at the DFG Research Training Group 1913 at the Brandenburgische Technische Universität Cottbus-Senftenberg (Post-doc project: The Art of Vaulting. Design and Construction of Large Vaults in the Mediterranean Gothic). Her research interests are focused in construction, geometry and structural analysis of masonry buildings and survey of historical buildings.
Together with Ignacio Gil and other lecturers implemented the workshop of tile vaults of the Polytechnic University of Madrid in 2013.

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About the guests:

Conservación y Restauración de Yesos Artesanos
CReA

Carlos Martín

Carlos Martín is a mason specialized in the construction of vaults. He followed the tradition of the family, masons for some generations and learning the construction techniques from his father.
He runs his own company CReA and has worked on the intervention of many historical buildings with the reconstruction of many vaults. He has also participated in many workshops sharing his knowledge with students of different countries.
Last year he participated with Norman Foster in the Biennale di Venezia, building a tile vault as a prototype for an aerodrome in Rwanda.

Ignacio Gil
PhD Architect, Director of the Research Center "José Joaquín de Mora" (Cárdenas Foundation, Madrid, Spain). Distinguished Member of the Chair "Gonzalo de Cárdenas" on the Vernacular Architecture of Havana. Directive of the Spanish Society on Construction History. Directive of the Spanish Society of Castles Friends. Full Member of the Centro de Estudios Sorianos (CSIC), Director of the journal Castillos de España (Castles of Spain), invited professor to several universities (Spain, Romania, Ecuador, Canadá, Portugal). ARCC/KING Award by Architectural Research Centers Consortium for the excellence in architectural research. Historical-archaeological Research Award "José Luis Moro 2013" of the Spanish Society of Castles Friends. Award "Defense 2014, research modality, category PhD thesis", of the Defense Ministry of Spain, Extraordinary PhD Award from the Polytechnic University of Madrid. Research and publications about Fortification, Construction History and Traditional Construction and Architecture.
Together with Paula Fuentes and other lecturers implemented the workshop of tile vaults of the Polytechnic University of Madrid in 2013.