

7ICCH

Seventh International Congress on Construction History



Final Programme

Lisbon, Portugal
July 12-16, 2021

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7ICCH Presentation

We are what we build and how we build; thus, the study of Construction History is now more than ever at the centre of current debates as to the shape of a sustainable future for humankind.

Under the main theme “**History of Construction Cultures**”, the **7ICCH – Seventh International Congress on Construction History** will provide an opportunity to celebrate and expand our understanding of the ways in which everyday building activities have been perceived and experienced in different cultures, times and places. The event also aims to provide a forum for researchers from all backgrounds to present the results of their work in the sphere of Construction History.

The **7ICCH** is the first congress convened under the *aegis* of the IFCH - International Federation of Construction History, founded in July 2018 in Brussels. The first edition of the International Congress on Construction History took place in Madrid in 2003. Since then, it has been a regular event organized at three-year intervals: previous editions were held in Cambridge (2006), Cottbus (2009), Paris (2012), Chicago (2015) and Brussels (2018). Therefore, the 7ICCH Organizing Committee is very grateful to all the members of the Federation, composed of the presidents of the British, Francophone, German, Portuguese, Spanish, and USA Societies, and its co-opted member (Belgium).

The Congress is focused on the history of building construction and although the cross-over with other disciplines is strongly stimulated, the Congress does not accept papers that focus solely on the history of technology, architectural history, architectural theory or conservation and repair. Best papers awards will be granted to PhD researchers who have presented a paper as first author, started their PhD in 2015-2020 and have not defended their doctorate in 2020.

We wish to express our immense gratitude to all members of the International Scientific Committee, who, despite the difficult context of the pandemic, worked intensively every time they were called on to give their rigorous evaluation of the different papers. A special thanks is due for all the expertise and experience that was passed on by our colleagues who have been organizing this unique and world significant event since 2003, and in particular to our predecessors from all the Belgian universities who organized 6ICCH.

The **7ICCH** Organizing Committee wishes to extend its sincerest thanks to authors and co-authors for their support, patience, and efforts. This congress would not exist but for the time, knowledge, and generosity they invested in the initiative.

Finally, we are grateful to all members of the Local Committee and to the institutions that have supported both the 7ICCH event and the publication of the proceedings.

We are looking forward to having you join us from 12 to 16 July!

On behalf of the 7ICCH Organizing Committee

João Mascarenhas-Mateus (Chairman)



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Organizing Institutions / Supporting Institutions



Keynote Speakers

Marco Fabbri (Università degli Studi di Roma Tor Vergata, Italy)

Building in the Ancient Rome: the fortifications of Pompeii



**Monday
12 July**

11.30h-12-30h

Vitale Zanchettin
(Sovrintendenza ai Beni Architettonici Musei Vaticani, Italy)

Raphael's architecture: buildings and materials



**Tuesday
13 July**

11.30h-12-30h

Stefan Holzer
(Eidgenössische Technische Hochschule Zürich, Switzerland)

The role of temporary works on the medieval and early modern construction site"



**Thursday
15 July**

11.30h-12-30h

Beatriz Mugayar Kühl
(Faculdade de Arquitetura e Urbanismo, Universidade de São Paulo, Brazil)

Railways in São Paulo (Brazil): impacts in the constructive culture and on the transformation of the territory



**Friday
16 July**

11.30h-12-30h

General Programme Outline

General programme outline*, **

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
09h00_						_09h00
10h00_	Registration	MODULE 3 Building materials II Building materials III Building materials IV Building machines, tools and equipment I Building machines, tools and equipment II		MODULE 8 Political, social and economic aspects I Political, social and economic aspects II Political, social and economic aspects III Political, social and economic aspects IV Political, social and economic aspects V	MODULE 11 Form with no formwork (vault construction with reduced formwork) Hypar concrete shells. A structural, geometric and constructive revolution in the mid-20th century Cultural translation of construction cultures I Cultural translation of construction cultures II Cultural translation of construction cultures III	
11h00_	Opening - Plenary session					_11h00
11h30_	Short break	Short break		Short break	Short break	_11h30
12h30_	Marco Fabbri Keynote presentation	Vitale Zanchettin Keynote presentation		Stefan Holzer Keynote presentation	Beatriz Mugayar Kühl Keynote presentation	_12h30
	Long break	Long break		Long break	Long break	
13h30_	MODULE 1 The discipline of Construction History I Building actors I Building actors II Building actors III Building actors IV	MODULE 4 Construction processes I Construction processes II Construction processes III Construction processes IV Construction processes V	MODULE 6 Building services and techniques I Building services and techniques II Building services and techniques III Structural theory and analysis I Structural theory and analysis II	MODULE 9 Knowledge transfer I Knowledge transfer II Knowledge transfer III Knowledge transfer IV Historical timber constructions between regional tradition and supra-regional influences I	MODULE 12 Cultural translation of construction cultures IV Construction cultures of the recent past: Building materials and building techniques 1950-2000 Can Engineering culture be improved by Construction History?	_13h30
15h30_						_15h30
16h00_	Short break	Short break	Short break	Short break	Short break	_16h00
18h00_	MODULE 2 Building actors V Building actors VI Building materials I Understanding the culture of building expertise in situations of uncertainty (Middle Age-Modern times)	MODULE 5 Construction processes VI Construction processes VII Construction processes VIII Historicizing material properties: Between technological and cultural history	MODULE 7 Structural theory and analysis III Structural theory and analysis IV Structural theory and analysis V South-South cooperation and non-alignment in the construction world, 1950-1980s	MODULE 10 Knowledge transfer V Knowledge transfer VI Knowledge transfer VII Historical timber constructions between regional tradition and supra-regional influences II	Awards & Closing Session	_18h00

* this timetable refers to the Summer Local time in Lisbon (WET, GMT+1).

** links for the online participation will be sent individually.

Sessions

MODULE 1 (5 parallel sessions)

Open Session: The discipline of Construction History

Monday, 12 July, 12:30-15:30

Chaired by *James Campbell*

Viollet-le-Duc and the *élasticité* of Gothic structures

Santiago Huerta

Finding value in the ordinary to better understand the extraordinary. Systematic surveys in baroque roofs and medieval log-buildings

Martin Gantner

The post-war construction site in photographs: The photographic collection of the Belgian contractor firm Van Laere (1938)

Jelle Angillis, Lara Schrijver & Inge Bertels

Open Session: Building Actors I (18th-20th centuries)

Monday, 12 July, 12:30-15:30

Chaired by *John Ochsendorf*

Building the ephemeral in Turin, capital of the Savoyard States

Valentina Burgassi & Mauro Volpiano

The business of the early consulting engineer: The case of Thomas Telford (1815-1834)

Mike Chrimes

Modernization of civil construction in Brazil in the second half of the 19th century: Strategies of a local entrepreneur

Renata Pereira, Ana Beatris Menegaldo & Julia Fernandes

Brussels iron and steel builders in the 19th and 20th centuries: A macroeconomic and spatial exploration

Frederik Vandyck, Matthijs Degraeve & Stephanie Van de Voorde

MODULE 1 (5 parallel sessions)

Open Session: Building Actors II (1900s-1920s)

Monday, 12 July, 12:30-15:30

Chaired by *Inge Bertels*

Salvaging construction materials in Brussels, 1900-1925

Ine Wouters & Jelena Dobbels

Building the Beaux-Arts in the Steel City: Pittsburgh's Rodef Shalom Synagogue, 1906-1907

Christopher Drew Armstrong

Industrialising timber craftsmanship: Early glulam within the traditional timber construction in Switzerland

Mario Rinke & Roshanak Haddadi

Luigi Santarella: Reinforced concrete design culture through the technical literature

Alberto Bologna & Cinzia Gavello

Open Session: Building Actors III (1920s-1930s)

Monday, 12 July, 12:30-15:30

Chaired by *Ana Paula Pires*

Entanglements within an emerging technology: Swiss Federal Railways and early glulam

Roshanak Haddadi & Mario Rinke

Technique and architecture in the work of Manuel Sanchez Arcas, 1920-1936

Ana Rodríguez García & Rafael Hernando de la Cuerda

The TRABEKA company, civil engineering works contractor in Katanga and Belgium (1924-1955)

Bernard Espion & Michel Provost

The Ghent Booktower (1933-1947): A product of collaborating professionals within institutional know-how

Laurens Bulckaen & Rika Devos

Open Session: Building Actors IV (1930s-1950s)

Monday, 12 July, 12:30-15:30

Chaired by *Carlos Vargas*

Building the Estado Novo. Construction companies and public works in Portugal (1933-1974)

João Mascarenhas-Mateus, Manuel Marques Caiado & Ivo Veiga

The introduction of prestressed concrete in Portugal: Teixeira Rêgo

Clara Pimenta do Vale, Maria da Luz Sampaio & Rui Fernandes Póvoas

Claudio Marcello and his dam

Francesca Argenio & Tullia Iori

Visionary engineering between utopia and futurism. Italian structures beyond borders after World War Two

Gianluca Capurso & Francesca Martire

MODULE 2 (4 parallel sessions)

Open Session: Building Actors V (1950s-1960s)

Monday, 12 July, 16:00-18:00

Chaired by *Tulia Iori*

Between academy and practice: Adriano Galli and the prestressed water bridge over the Casilina in Mignano Montelungo (1954)

Lorenzo Grieco & Maria Grazia D'Amelio

Italian tall buildings by Società Generale Immobiliare (SGI) in the 1950s-1960s. Some Milanese case studies

Francesco Spada

Construction culture between tradition and modernity: Three works by Álvaro Siza

Teresa Cunha Ferreira, Eduardo Fernandes & Frederico Barbosa

Industrialization by CasMez and steel built factories in Southern Italy

Alessandra Tosone & Danilo Di Donato

Open Session: Building Actors VI (1960s-1970s)

Monday, 12 July, 16:00-18:00

Chaired by *João Mascarenhas-Mateus*

The 'exact fantasy' of steel. The impossible mission of *Costruzioni Metalliche Finsider* (CMF)

Clara Nuzzolese

A concrete story: The 15-year collaboration between Harry Seidler and Pier Luigi Nervi, 1963-1978

Paolo Stracchi

The experiments on measurement models for the Munich Olympic site

Benjamin Schmid & Christiane Weber

The "3-dimensional wall" of the Centre Pompidou in Paris: Invention and evolution of a polyvalent device

Boris Hamzeian

Open Session: Building materials I (13th-18th centuries)

Monday, 12 July, 16:00-18:00

Chaired by *Wido Quist*

Wood as a building material in Toruń: A contribution to research on medieval carpentry art of Northern Poland

Ulrich Schaaf & Maciej Prarat

The glaziers' invoices from the Plantin-Moretus archives 1600-1800

Liesbeth Langouche

The House of Mercy of Lourinhã: Contributions for the Construction History in the early 17th century

Joana Balsa de Pinho

Spatial and structural features of St Petersburg architecture in the 18th century: Transition from wood to brick

Sergey Sementsov

Thematic Session: Understanding the culture of building expertise in situations of uncertainty (Middle Age-Modern times)

Monday, 12 July, 16:00-18:00

Chaired by *Michela Barbot, Robert Carvais, Emmanuel Château-Dutier and Valérie Nègre*

A building expert without building training: The city of Lisbon *vedor* of works (14th-19th centuries)

Sandra M. G. Pinto

Maintaining / repairing Paris through expertise (1690-1790)

Michela Barbot, Robert Carvais, Emmanuel Château-Dutier & Valérie Nègre

repair, renovate, or replace: A maintenance history of Virginia's state buildings

Libby Cook

Conflicts in the Brussels construction sector (1957-59): Judicial expertise of architects, engineers and contractors

Jelena Dobbels

MODULE 3 (5 parallel sessions)

Open Session: Building materials II (18th-19th centuries)

Tuesday, 13 July, 09:00-11:00

Chaired by *Rui Fernandes Póvoas*

Transition from wood to iron in French theatre structures: A new construction system

Katerina Maria Chalvatzi

Designing a ground-breaking structure. Notes on the cast-iron/wrought-iron dome of the former Halle au Blé, 1809-1813

Matteo Porrino

Impact of European knowledge on the development of reinforced concrete in the Russian Empire

Vladimir Korensky

Open Session: Building materials III (19th-20th centuries)

Tuesday, 13 July, 09:00-11:00

Chaired by *Humberto Varum*

Metal structural work embedded in concrete for slender vaults, 1880-1910

Beatrice Lampariello

On horizontality in architecture: Robert Maillart, The Queen Alexandra Sanatorium, and the evolution of the slab

Daniel Korwan

Hidden in the mix: How a regionally specific aggregate affected St. Louis Missouri's built environment

Liane Hancock

Open Session: Building materials IV (1920s-1960s)

Tuesday, 13 July, 09:00-11:00

Chaired by *Clara Pimenta do Vale*

The Northern Lock, The Netherlands: At the frontier of 1920s concrete technology

Timo Nijland & Herdis Heinemann

A reinforced concrete stage tower within a 18th-century masonry theater: The Municipal Theater of Bologna

Davide Prati, Giorgia Predari, Angelo Massafra & Beatrice Salmi

Wooden Structures by G. G. Karlsen and the Derevyagin beam

Paul Bell

Open Session: Building machines, tools and equipment I (from antiquity to the 20th century)

Tuesday, 13 July, 09:00-11:00

Chaired by *Christine Wall*

The tools of the Roman stone craftsman: The marks left on marble decorative elements in Valeria
Javier Atienza Fuente

An innovative flooring technique in Roman times (Villa of Diomedes, Pompeii)
Hélène Dessales & Florence Monier

How to build a (brick) barrel vault
Stefan M. Holzer

Quicker, cheaper, higher: A “new” French scaffolding system in the first half of the 20th century
Juliette Pernin

Open Session: Building machines, tools and equipment II (1930s-1960s)

Tuesday, 13 July, 09:00-11:00

Chaired by *Amit Srivastava*

The emergence of electric arc welding in the construction and reinforcement of railway bridges in France, 1930s-1940s
Stéphane Sire, Bernard Espion & Muriel Ragueneau

Development and rationalization of formwork for curved concrete shells in the Japanese construction industry in the 1950s
Sei Hayasahi, Tomoyuki Gondo & Hiraku Chiba

Danish spheres and Australian falsework: Casting the Sydney Opera House
Luciano Cardellicchio, Paolo Stracchi & Paolo Tombesi

MODULE 4 (5 parallel sessions)

Open Session: Construction processes I (Ancient Period)

Tuesday, 13 July, 13:30-15:30

Chaired by *Jos Tomlow*

Early Greek temple design and roof construction

Alessandro Pierattini

Precursors of aseismic design: The case of Achaemenid monumental architecture

Mahdi Motamedmanesh

Incomplete: The discontinued building project of a Greek temple of the Classical period

Heike Bücherl

On-site design decisions at the Basilica of Maxentius in Rome

Luise Albrecht & Marina Döring-Williams

Open Session: Construction processes II (11th-13th centuries)

Tuesday, 13 July, 13:30-15:30

Chaired by *David Wendland*

Investigating forms and formwork in the nave aisles at Tewkesbury Abbey

James Hillson, Alexandrina Buchanan & Nicholas Webb

Three hybrid church roofs from 1150-1250 in Western Sweden

Robin Gullbrandsson & Mattias Hallgren

The construction of the medieval domes of the Basilica of St Anthony in Padua

Martina Diaz, Louis Vandenabeele & Stefan M. Holzer

Simply complex: Case studies on complex stone constructions of High Medieval courtly chimneys

Jonas Lengenfeld

Open Session: Construction processes III (13th-16th centuries)

Tuesday, 13 July, 13:30-15:30

Chaired by *Javier Giron*

Medieval transformations of the Basilica of St Anthony in Padua based on an analysis of the original brickwork

Louis Vandenabeele

Two- and three-dimensional geometry in tierceron vaults: A case study of the cloister at Norwich Cathedral

Nicholas Webb, James Hillson & Alexandrina Buchanan

Vaults, centring, and formwork of the Late Gothic period in Southern Germany

Clemens Voigts

The frame vault of the anti-refectory in the Olivetan Abbey of St. Nicholas in Rodengo Saiano

Chiara Stanga

Open Session: Construction processes IV (16th-19th centuries)

Tuesday, 13 July, 13:30-15:30

Chaired by *Yunlian Chen*

Building a castle in Japan: Analysis of the masonry construction process through the folding screen Chikujō-zu byōbu

Delphine Vomscheid

The Gothic Town Hall model of Augsburg

Maximilian Schöll & Christiane Weber

Haft-rang tile workshop in Qajar Iran: Production and craftsmen

Atefeh Seyed Mousavi

Erudite vaults by anonymous builders: The vaulted houses of Fuzeta (Portugal)

Mafalda Batista Pacheco

MODULE 4 (5 parallel sessions)

Open Session: Construction processes V (19th-20th centuries)

Tuesday, 13 July, 13:30-15:30

Chaired by *Donald Friedman*

Pneumatic foundations in the bridges of the first Italian railways

Matteo Abita & Renato Morganti

Reclamation work and stone masonry at the Nagasaki Harbour wharves (1889-97)

Yunlian Chen

Ipiranga Museum: 3D laser scanning as a contribution to Construction History

Renata Cima Campiotto & Beatriz Mugayar Kühl

Black concrete power: The Tuskegee block and Low Cash-Cost Housing

Vyta Pivo

MODULE 5 (4 parallel sessions)

Open Session: Construction processes VI (19th-20th centuries)

Tuesday, 13 July, 16:00-18:00

Chaired by *Fabián Santiago Lopez-Ulloa*

Private responsibility for public safety: The case of Charles Buddensiek
Donald Friedman

Bridge replacement due to structural obsolescence. The case of the Ciudad Real-Badajoz railway bridges (Spain)
Pedro Plasencia-Lozano

The Sant'Elia Kindergarten in Como: Structural behaviour and the issue of durability
Anna Greppi & Carolina Di Biase

The development and use of non-staining cements in American masonry
Heather Hartshorn

Open Session: Construction processes VII (1950s-1960s)

Tuesday, 13 July, 16:00-18:00

Chaired by *Thomas Leslie*

Masonry and its role in the mid-20th century: G area houses in the Le Vallette district of Turin
Maria Luisa Barelli & Cesare Tocci

Modern dwellings after World War II: An Italian experience of wooden prefabrication by Legnami Pasotti
Laura Greco

The innovative application of the curtain wall in the Galfa Tower
Carlo Costantino, Anna Chiara Benedetti, Cecilia Mazzoli & Riccardo Gulli

Morandi (1957-1962) and the cable-stayed Bridge over Lake Maracaibo: Pioneering contributions
Francisco Mustieles, Ignacio Oteiza, Sebastián Delgado & Pedro Romero

MODULE 5 (4 parallel sessions)

Open Session: Construction processes VIII (1960s-1980s)

Tuesday, 13 July, 16:00-18:00

Chaired by *Enrique Rabasa-Díaz*

The USM HALLER *stahlbausystem* MINI-MIDI-MAXI, designed by Fritz Haller, 1959-1987

Carlo Nozza

The Catalan vaults of Roberto Gottardi's School of Theater in Havana: Some discoveries on the construction technique

Michele Paradiso, Stefano Galassi & Sara Garuglieri

Plovdiv concrete: modern, bold, valuable? Houses of Youth and of Science and Technology

Iva Stoyanova

Thematic Session: Historicizing material properties: Between technological and cultural history

Chaired by *Robby Fivez, Simon De Nys-Ketels* and *Katie Lloyd Thomas*

Tuesday, 13 July, 16:00-18:00

Comparative analysis of bricks manufactured in the New World (1494-1544)

Esteban Prieto-Vicioso & Virginia Flores-Sasso

The specification as an instrument for colonizing Oseti Sakowin lands

Jessica Garcia Fritz

Earthly beings and the Arts and Crafts discourse in the Cape: Conflicted and contradictory (non)appropriations of vernacular traditions

Nicholas Coetzer

Architecture, urbanism, construction work and local labor at the turn of the 20th century in Lourenço Marques, Mozambique

Lisandra Franco de Mendonça

Transparent acrylic constructions before and after 1950 - from the 1935 Opel Olympia to the 1972 Olympic roof

Susanne Brunner

MODULE 6 (5 parallel sessions)

Open Session: Building services and techniques I (1st-16th centuries)

Wednesday, 14 July, 13:30-15:30

Chaired by *Hélène Dessales*

Observations on the design and building of the Roman Segovia Aqueduct

Jos Tomlow

Medieval geometry and the Gothic style at the Cathedral of Tortosa

Josep Lluís i Ginovart, Mónica López Piquer, Cinta Lluís Teruel & Iñigo Ugalde Blázquez

Acoustic vases in the Portuguese synagogue of Tomar: Analogies with other coeval worship buildings

Anabela Moreira

The vaulted systems of the colonial city of Quito, Ecuador

Fabián S. Lopez-Ulloa & Ana López-Ulloa

Open Session: Building services and techniques II (19th-20th centuries)

Wednesday, 14 July, 13:30-15:30

Chaired by *Paula Fuentes Gonzalez*

Pursuing comfort in late 19th century school buildings in Milan: Technical knowledge and role of the enterprises

Alberto Grimoldi & Angelo Giuseppe Landi

Space funicular polygons and their applications by Emile Foulon

Thierry Ciblac

Lighting and visual comfort systems in administrative buildings in 1950s Milan

Giulio Sampaoli

Energy-aware construction within the Modern Movement: Erskine's approach

Elena Poma

Open Session: Building services and techniques III (1950s-1960s)

Wednesday, 14 July, 13:30-15:30

Chaired by *Stephanie Van de Voorde*

We're not in Kansas anymore: ASHRAE and the global growth of thermal comfort research
Andrew Cruse

'Sirapite for Sopranos': Tempered construction and designing for musical tone
Fiona Smyth

The 1968 Integrated Facade System by Josef Gartner
Rouven Grom & Andreas Putz

Open Session: Structural theory and analysis I (1st-12th centuries)

Wednesday, 14 July, 13:30-15:30

Chaired by *Werner Lorenz*

The *aditus maximus* of the Roman Theatre in Málaga. An early model of Roman stonework vault
Ricardo Garcia-Baño, Macarena Salcedo-Galera, Pau Natividad-Vivó & Vincenzina La Spina

Experimental analysis to define the stability conditions of the Temple of Vesta in *Forum Romanum*
Fabrizio De Cesaris & Anna Gallo

Geometry by eye: Medieval vaulting of the Anba Hadra Church (Egypt)
Heike Lehmann

The construction and stereotomy of the medieval vaults in Notre-Dame: Planning, stone-cutting and building of the double-curved shells
David Wendland, Mark Gielen & Vladimir Korensky

Open Session: Structural theory and analysis II (12th-17th centuries)

Wednesday, 14 July, 13:30-15:30

Chaired by *Santiago Huerta*

Geometry and construction of the severies of the vaults in the Cathedral of *Notre Dame de Paris*
Rocío Maira Vidal

Vaults on the water: A systematic analysis of vault construction in the *Wasserkirche* Zurich
Manuel Maissen

Stone and brick flat vaults from the 16th century in Spain
Marta Perelló & Enrique Rabasa-Díaz

The renovation of the Church of San Benito Abad in Agudo (Ciudad Real, Spain) through a 17th-century drawing
Raquel Ramiro-Mansilla & Francisco Pinto-Puerto

MODULE 7 (4 parallel sessions)

Open Session: Structural theory and analysis III (18th-19th centuries)

Wednesday, 14 July, 16:00-18:00

Chaired by *Pedro Mendes*

The geometric design of the “Guarinesque” vaults in Banz and Vierzehnheiligen in relation to the treatises of stereotomy

Rebecca Erika Schmitt & David Wendland

Joseph M. Wilson, Henry Pettit and the iron truss bridges of the Pennsylvania Railroad

Dario Gasparini

Construction of English fan vaults: The tangent plane as a surface of operation

Fabio Tellia

Graphical analysis of masonry domes. Historical approaches (1850-1900)

Paula Fuentes

Open Session: Structural theory and analysis IV (1900s-1950s)

Wednesday, 14 July, 16:00-18:00

Chaired by *Júlio Appleton*

Portuguese timbrel vaults - description and constructive tests

António Gago, João Rei & Manuel Fortea Luna

The bells of Brisbane Cathedral

Jacques Heyman

Calculation methods for reinforced concrete structures at the beginning of the 20th century: The Modernissimo Theater in Bologna

Giorgia Predari & Davide Prati

The Orense railway station, a shell roof by Eduardo Torroja

Joaquín Antuña

Open Session: Structural theory and analysis V (1950s-1980s)

Wednesday, 14 July, 16:00-18:00

Chaired by *António Sousa Gago*

Structural design via form finding: Comparing Frei Otto, Heinz Isler and Sergio Musmeci

Giulia Boller & Pierluigi D'Acunto

The practical geometry of Persian ribbed vaults: A study of the rehabilitation of the Kolahduzan Dome in the Tabriz Historic Bazaar

Soheil Nazari

Structure in Villa Dall'Ava: Rational order versus conceptual order

Luis Burriel-Bielza

Thematic Session: South-South cooperation and non-alignment in the construction world, 1950-1980s

Wednesday, 14 July, 16:00-18:00

Chaired by *Amit Srivastava, Peter Scriver and Ljubica Spaskovska*

Prefabricating non-alignment: The IMS Žeželj system across the decolonized world

Jelica Jovanović

Mostogradnja and Yugoslavia in Iraq: A bridge on the Euphrates near Fallujah (1964-1967)

Luka Skansi & Jelica Jovanović

Non-Alignment and patterns of freedom and dominance

Marwa M. El-Ashmouni

Indian immigration and building construction in the UAE: Beginnings of a pilot study

Shaji Panicker

An Indian engineer in the Middle East: South-South cooperation and professional collaboration in the 1970s

Vandini Mehta & Rohit Raj Mehndiratta

MODULE 8 (5 parallel sessions)

Open Session: Political, social and economic aspects I

Thursday, 15 July, 09:00-11:00

Chaired by *Dirk Van de Vijver*

The Manning Specification

Elizabeth Shotton

From regulation to everyday construction practice. The Lisbon building codes between 1864 and 1930

Caio Rodrigues de Castro & Amílcar Pires

Swing bridges in the 19th century Italian dockyards

Renato Morganti, Alessandra Tosone, Danilo Di Donato & Matteo Abita

Early General Contracting in Siam, 1870s-1910s

Pinai Sirikiatikul

Open Session: Political, social and economic aspects II

Thursday, 15 July, 09:00-11:00

Chaired by *João Vieira Caldas*

Pedreño y Deu Pantheon: An example of late-19th-century funerary architecture in Spain

David Navarro Moreno & María José Muñoz Mora

Building controls in New Zealand: A brief history, 1870 to the 1930s

Nigel Isaacs

By-passing the bye-laws: The 1905 Letchworth Cheap Cottages exhibition

Anne Coste, Sadoux Stephane & Susannah O'Carroll

Open Session: Political, social and economic aspects III

Thursday, 15 July, 09:00-11:00

Chaired by *Robert Carvais*

Towards a social history of the Portuguese construction industry (1914-1918)

Ana Paula Soares Pires & João Mascarenhas Mateus

Evolution of the Mexico City Building Code for tall buildings in the 20th century

Perla Santa Ana, Lucia Santa Ana Lozada & Jose Baez Garcia

Monumentality in modern construction processes. An ideological exposure of totalitarian strategies

Christoph Breser

Bricks of wrath: (Re)building the *IJzertoren* memorial (1925-1930) and (1952-1965)

Willem Bekers, Ronald De Meyer & Emiel De Kooning

Open Session: Political, social and economic aspects IV

Thursday, 15 July, 09:00-11:00

Chaired by *Ivo Veiga*

Alentejo Marbles in the construction of the Basilica of Our Lady of the Rosary of Fátima, Portugal

Clara Moura Soares, Rute Massano Rodrigues, Carlos Filipe & Noel Moreira

Tile vaults in the works of government institutions after the Spanish Civil War: A first approach

Esther Redondo Martínez & Francisco Javier Castilla Pascual

The metamorphoses of the EUR Water Tower, Rome, between autarchy and economic miracle (1940-59)

Maria Grazia D'Amelio & Lorenzo Grieco

The constructive principles behind the materials and techniques used in state-subsidised housing buildings: The Improvement Plan (Porto)

Luciana Rocha & Rui Fernandes Póvoas

MODULE 8 (5 parallel sessions)

**Open Session: Political, social and economic aspects V
(1950s-1960s)**

Thursday, 15 July, 09:00-11:00

Chaired by *Teresa Cunha Ferreira*

Construction of diplomatic embassies, Post-Independence New Delhi
Bhawna Dandona & Prashansa Sachdeva

The modernization of raw earth in Morocco: Past experiments and present
Nadya Rouizem

The construction history of the N2 motorway: Networking on reinforced concrete in the Canton of Ticino
Ilaria Giannetti

MODULE 9 (5 parallel sessions)

Open Session: Knowledge transfer I (13th-18th centuries)

Thursday, 15 July, 13:30-15:30

Chaired by *Arnaldo Sousa Melo*

The brick vaults of the Torre Alfonsina in Lorca Castle. Geometric aspects and possible sources
Pau Natividad-Vivó, Ricardo García-Baño, Macarena Salcedo-Galera & José Calvo-López

Leonardo da Vinci, building construction and knowledge transfer
Hermann Schlimme

The art of building in New Spain: knowledge dissemination and religious orders in the 16th century
Raúl A. Musiate & Marica Forni

The roots of the 18th century turning point in earthquake-resistant building
Cesare Tocci, Caterina Felicita Carocci & Valentina Macca

Open Session: Knowledge transfer II (18th-19th centuries)

Thursday, 15 July, 13:30-15:30

Chaired by *Thierry Ciblac*

Continuous stucco and smalto flooring in the former Austrian Lombardy: Sources, techniques and communication
Marica Forni

Rebuilding after the earthquake: Earthquake-resistant construction techniques in Sicily in the 18th and 19th centuries
Federica Scibilia

Education at the École centrale in Paris and its influence on the creation of modern iron construction
Tom Peters

Innovation and technology in the 19th-century Belgian window glass industry
Vitaly Volkov

MODULE 9 (5 parallel sessions)

Open Session: Knowledge transfer III (19th-20th centuries)

Thursday, 15 July, 13:30-15:30

Chaired by *Robert Thorne*

Compound brick vaults by slices in written sources

Rafael Marín Sánchez, Manuel De Miguel Sánchez, Pablo Navarro Camallonga & Vincenzina La Spina

The first patents of prefabrication and the industrialization of reinforced concrete in Spain and Europe: 1886-1906

Francisco Domouso & Andrés Abásolo

Brick vaults by slices in Toledo

Ana López-Mozo, Miguel Ángel Alonso-Rodríguez, Rafael Martín-Talaverano & Licia Aliberti

"Dry and Ready in half the time": Gypsum wallboard's uneasy history

Thomas Leslie

Open Session: Knowledge transfer IV (1900s-1930s)

Thursday, 15 July, 13:30-15:30

Chaired by *Yiting Pan*

A study of the history of concrete technology introduction in China

Qian Du & Bowen Qiu

Victor Horta and building construction. The written testimonies of the architect's teachings and library

Dirk Van de Vijver

Who built the timber formwork for fair-faced reinforced concrete?

Meltem Çavdar

Knowledge transfer in reinforced concrete bridges during the 1930s

Eberhard Pelke & Karl-Eugen Kurrer

Thematic Session: Historical timber constructions between regional tradition and supra-regional influences I

Thursday, 15 July, 13:30-15:30

Chaired by *Clemens Knobling*

Timber floors made with elements shorter than the span covered in treatises and technical literature

Emanuele Zamperini

Historic bell frames – regional traditions and transregional influence

Iris Engelmann

Large span timber roofs in Italy between the 16th and 19th centuries

Giovanni Mochi & Luca Guardigli

Design-Fabricate-Assemble-Marvel - 18th and early 19th century bridge models in the construction process

Philip Caston

MODULE 10 (4 parallel sessions)

Open Session: Knowledge transfer V (1930s-1950s)

Thursday, 15 July, 16:00-18:00

Chaired by *Beatriz Mugayar Kühl*

Architects, engineers, and two construction companies: Introducing reinforced concrete technology in South America (Brazil and Argentina)

Maria Luiza Macedo Xavier de Freitas

Thermal standards, rationality and choices – To regulate or design thermal environments in Santiago de Chile

Lionel Epiney

Wooden churches, managers and Fulbright scholars: Glued laminated timber in 1950's Norway

Maryia Rusak

Open Session: Knowledge transfer VI (1950s-1970s)

Thursday, 15 July, 16:00-18:00

Chaired by *Vítor Cóias e Silva*

The SEAT Dining Hall in Barcelona (1956): Aeronautical construction applied to architecture

David Resano & Cesar Martín Gómez

Open systems for open plans: Jean Prouvé's contribution to school building systems in the 1960s and 1970s

Adrian Leander Pöllinger

The Cor-Ten steel structure of the Royal Belge (1970): New insights

Veronique Boone & Alison Inglis

Open Session: Knowledge transfer VII (1970s-2000s)

Thursday, 15 July, 16:00-18:00

Chaired by *Mario Rinke*

The RBC building system – How to innovate between central planning and personal networks in the late GDR

Elke Richter & Konrad Frommelt

From form to words: Knowledge transfer vehicles in late-20th-century Portuguese modern architecture

Ricardo Costa Agarez

Concerning the research “Material history of the built environment and the conservation project” (2008-2020), methodology and results

Franz Graf & Giulia Marino

Thematic Session: Historical timber constructions between regional tradition and supra-regional influences II

Thursday, 15 July, 16:00-18:00

Chaired by *Clemens Knobling*

Late 18th-century innovation: The first Mediterranean purlin roof truss in German-speaking Switzerland at Embrach ZH

Jasmin Schäfer

Philibert de l'Orme roof constructions in Leiden and The Netherlands, innovation versus tradition between 1800 and 1900

Edwin Orsel

Timber roof structures of 19th-century military riding halls in Switzerland

Kylie Monee Russnaik

MODULE 11 (5 parallel sessions)

Thematic Session: Form with no formwork (vault construction with reduced formwork)

Friday, 16 July, 09:00-11:00

Chaired by *Ana López-Mozo, Enrique Rabasa-Díaz, José Calvo-López and Rafael Marín-Sánchez*

Brick vaulting without centering in the Mediterranean from Antiquity to the Middle Ages
Paolo Vitti

Geographic and chronological extent of brick vaults by slices
Enrique Rabasa-Díaz, Alberto Sanjurjo Álvarez, Ignacio-Javier Gil-Crespo & Ana González-Uriel

On the origin of certain vaults without formwork: Iranian timbrel vaults
Antonio Almagro

Types and uses of vaults and timbrel vaults in Interior Alentejo: Data for a typological study
Ana Costa Rosado

Forging the link among shape, formwork, and mortar assemblies in Guastavino vaulting
Erin Murphy, Tim Michiels & Derek Trelstad

Thematic Session: Hypar concrete shells. A structural, geometric and constructive revolution in the mid-20th century

Friday, 16 July, 09:00-11:00

Chaired by *Juan Ignacio del Cueto Ruiz and Joaquín Antuña Bernardo*

Juan Antonio Tonda, hiperbolic paraboloid builder
Eduardo Alarcón, Joaquín Antuña & Juan Ignacio del Cueto

Félix Candela and the auditorium shell of the Maracaibo Country Club, Venezuela: A dual structural story
Astrid Petzold Rodríguez, Francisco Mustieles Granell, Edwin González Meza & Sebastián Novoa Peña

The design and construction of Marcel Breuer's Hunter College Library hypars: Their origin and influences
Miguel Angel Calvo Salve

Replicating Candela's *Los Manantiales*
Mauricio Luzuriaga

The collapse of the Tucker's gym: Research impulses in the USA at the end of hypar shells era
Martina Russo

Open Session: Cultural translation of construction cultures I (16th century)

Friday, 16 July, 09:00-11:00

Chaired by *Maria do Carmo Ribeiro*

On the construction of Byzantine vaulted systems through the eyes of the 19th century French rationalists

Antonella Manzo

Style and stone - stonemasonry in Switzerland between the Gothic and the Renaissance

Katja John

Stability and construction of the 16th century Mexican rubble masonry vaults in Jiutepec Morelos

Fabian Bernal Orozco Barrera

The construction of the vaults in the cathedrals of the Viceroyalty of Peru

Claudio Mazzanti

Open Session: Cultural translation of construction cultures II (16th-18th centuries)

Friday, 16 July, 09:00-11:00

Chaired by *Hermann Schlimme*

Conception, materiality and development of coffered vaults in the churches of Goa

María Aranda Alonso

The domes in piperno stone of San Giacomo degli Spagnoli in Naples

Maria Teresa Como

Local interpretations of classical models: The architecture of San Antonio's missions churches, Texas

Angela Lombardi & Iacopo Benincampi

The transfer of thin wood vaulting from France to America

Benjamin Hays

Open Session: Cultural translation of construction cultures III (18th-20th centuries)

Friday, 16 July, 09:00-11:00

Chaired by *José Maria Lobo de Carvalho*

Tradition and invention in domestic construction in the Caribbean region: The case of Southern Puerto Rico

Jorge Ortiz Colom

Translating the “Chinese roof”: Construction culture hybridization in West China Union University

Haiqing Li

Creating an American Methodist College in China: A building history of Soochow University, 1900-1937

Yiting Pan & Xi Chen

“Imposing and provocative”: The design, style, construction and significance of Saint Anthony’s Cathedral, Xinjiang (Shanxi, China), 1936-40

Thomas Coomans, Yitao Xu & Jianwei Zhang

MODULE 12 (3 parallel sessions)

Open Session: Cultural translation of construction cultures IV (1950s)

Friday, 16 July, 13:30-15:30

Chaired by *Madalena Cunha Matos*

1950s housing in Milan: Façade design and building culture

Roberta Lucente & Laura Greco

Technological development in the construction of Kasumigaseki Building: Japan's first super high-rise

Tomoyuki Gondo

The skyscrapers of Milan: From experiments to recent constructive challenges

Simona Talenti & Annarita Teodosio

Thematic Session: Construction cultures of the recent past. Building materials and building techniques 1950-2000

Friday, 16 July, 13:30-15:30

Chaired by *Stephanie Van de Voorde* and *Ine Wouters*

The construction of efficiency: Glazing insulation in France and Belgium since 1945

Jean Souviron

Stopray window panes: Use and restoration in various Brussels buildings

Alison Inglis

Prefabrication and participation by users: A challenge in Italy (1960-1976)

Francesca Albani

Welcome to the free world! Building materials in post-Soviet Estonia in the 1990s

Maris Mändel

Demolishing the city, constructing the shoreline

Alison Creba & Jane Hutton

Thematic Session: Can Engineering culture be improved by Construction History?

Friday, 16 July, 13:30-15:30

Chaired by *Annette Bögle, Ignacio Payá-Zaforteza and Nicolas Janberg*

The potential roles of Construction History in Engineering education

Dermot O'Dwyer

RBL through analysis of the development of high-rise buildings in

Mexico City (1900-1952)

Lucia Santa Ana & Perla Santa Ana

The role of construction history in safety assessments: A case study of reinforced concrete
"Gerber" bridges in Italy

Stefania Mornati & Ilaria Giannetti

Problems of sources and bridges

Tullia Iori

