

CHSA is a forum for scholars and professionals to meet and exchange ideas and research. Membership is open to a wide range of construction related disciplines involved in the planning, development, design, construction, operation and preservation of buildings and engineering infrastructure.



SAVE THE DATE!

6ICCH!

July 9-13, 2018

Academy of Sciences
Brussels, Belgium

Its not too early to be
thinking about a
research subject!



SEATTLE!

CHSA Members Meeting - SUMMER 2017!

Next summer (dates TBA), join CHSA in beautiful Seattle for a regional members meeting! Hosted by the Architecture Department at the University of Washington Seattle, we will gather in the Emerald City - birthplace of Jimi Hendrix and Bill Gates, home to Boeing, Microsoft, Amazon, Starbucks and the futuristic Space Needle! Look for more information coming soon!



CHSA MEMBERS
IN THE NEWS
pg 2

BOOKS
pg 3

STRUCTURE
NEPAL
pg 4,5,6

TRAVELOGUE -
GLEN CANYON
DAM
pg 7

THANKS ON BE-
HALF OF CHSA!
pg 8

CHSA MEMBERS IN THE NEWS...

Sara Wermiel - visiting research fellow at the Brussels Centre for Urban Studies (BCUS) will lecture October 27th on the *'Historic Preservation Movement in the U.S.: From Ownership to Regulation'*.

Her lecture will cover the early history of the preservation movement in the United States, including how changes in the understanding of property rights, what constitutes heritage, and the impact of extensive urban renewal and highway programs after World War II have shaped the preservation framework of today. Sara Wermiel is an independent scholar who lives in Boston, Massachusetts, USA. She completed her PhD at the Massachusetts Institute of Technology in the fields of Urban Studies & Planning and History of Technology. As a BCUS visiting research fellow, Sara will study the regulations, incentives, and citizen initiatives aimed at preserving historic properties and districts in the Brussels region, and compare these with practices in the Boston (Massachusetts) region.

For more info on her visiting research fellowship see: <http://urbanstudies.brussels/people/sara-wermiel>



Central Artery project clearance - Boston (Wermiel)

CHSA MEMBERS PRESENTING CONSTRUCTION HISTORY SESSIONS

University of Minnesota, LearningLife – College of Continuing Education, November 7, 2016. The Crystal Palace: Triumph of Design, Engineering, and English Society with Brian Bowen, A. Peter Hilger, and Sir Joseph Paxton.

AIA Minnesota 2016 Convention, November 8, 2016, Minneapolis, Minnesota. A CHSA Two-in-One Program. “Transatlantic Cooperation in Construction Management: The Building of the Westinghouse Plan” by Brian Bowen, and “Reliance on Design: Roosevelt, Drydocks, and the Spearin Doctrine” by Jeffrey L. Beard, PhD.

SEI / ASCE Structures Congress, April 6, 2016, Denver, Colorado. Still in Use: Structural Engineering History and Contemporary Design Practice. “The Design Methods of John A. Roebling: 19th Century Paradigms for 21st Century Structures” by Stephen Buonopane, PhD, PE. “Early Twentieth Century Efforts and Twenty-First Century Structural Engineering Licensure” by Marci S. Uihlein, P.E. “Material Efficiency through Structural Form: The History and Future of Thin Shell Construction” by Tyler Sprague, PE., Ph.D., LEED AP. “The Bridge Designs of David B. Steinman” by Robert Dermody, AIA, NCARB. “Origins of the Profession: History of Structural Engineering and Design” by Armando Plata, PE, AIA, LEED AP BD+C.

COMING THIS FALL!

CHSA RESOURCE REPOSITORY - The Best of Construction History

We ask the CHSA community to send any and all research links, books, syllabi, and contacts that you think might be helpful to other members for inclusion in the CHSA Research Repository.

Please forward .pdfs to:
melaniefeerst@gmail.com

Thanks for your participation!



Benjamin Ibarra's book, "Mixtec Stonecutting Artistry," receives its second biennale medal as best publication in Mexico



Benjamin Ibarra is an Assistant Professor of Architecture at the University of Texas at Austin

This recent award was given within the framework of the 14th National and International Biennale of Architecture in Mexico organized by Federación de Colegios de Arquitectos de la República Mexicana. This biennale is the most prestigious in Mexico, which celebrates the best work and the most talented practitioners in the country. The award ceremony took place on October 5th at the Fine Arts Palace (Palacio de Bellas Artes) in Mexico City. The award was given in recognition to an outstanding research work that uses digital technologies of visualization in order to explore the relationships between geometry and stonecutting techniques necessary to design and build three different late-gothic vaults in Oaxaca, Mexico.

JOB BOARD

***Miami University,
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seeking a full time
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ANY JOB OPENINGS
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Structural Vulnerabilities of Nepalese Heritage Vishal Joshi

“No modern era natural disaster has ever damaged so much cultural heritage.” — Irina Bokova, UNESCO official. 1

The heritage of Nepal and in particular the Kathmandu Valley is unique and found nowhere else in the world. This is one of the reasons why eight out of seven UNESCO World Heritage Sites in Nepal are located within the Valley. This ‘Newari Style’ of construction bears influences from India, Tibet, and China and dates from early 13th to late 18th century, constructed during the Malla Dynasty of Nepal. The architecture is defined by the ‘Durbar Square’, which is an agglomeration of palaces, pleasure gardens, pavilions, and temples along ancient trade routes. The temples are of two types: wood frame Dega temples (Pagoda temples) having from one, three, or five tiers, always an odd number, and the Shikhara temples which are stone masonry pyramidal structures, an influence from India. The Square is further defined by Stupas which are hemispherical load bearing mounds.



Absence of a rigid Timber – Strut joint at the Vishwanath Temple, Patan Durbar Square



Absence of ring beams causing the cracks at the Bhaktapur Durbar Square

The April 2015 Gorkha earthquake with its 7.8 magnitude left a deep scar on the country. Not only did the earthquake wipe out lives and livelihoods, but it also irreversibly damaged the heritage of Nepal. In December 2015 as a part of the University of Texas at Austin School of Architecture travel scholarship program, I had the once in a lifetime opportunity to travel to Nepal. The goal was to carry out a visual reconnaissance of the heritage sites as well as to assist the Kathmandu Valley Preservation Trust in their ongoing efforts to make architectural drawings for the reconstruction of damaged or collapsed structures. The question on everybody’s mind was: why did a few historic buildings collapse, while others remained unscathed? After extensive research and taking this up as my thesis topic, I hypothesized that a few of the reasons are:

1) Unknown foundations: The present conditions of the foundation of the temples and the other historic buildings is relatively unknown. The stepped plinth of these structures above the ground level, seem to be the only foundations they have (mat-foundations). Further study of the structures and excavations around the foundations can help unravel the earthquake susceptibility of these foundation systems.

2) Weak Brick Walls: The brick walls consist of three layers: an outer layer with fired clay bricks, a central layer with brick bats, and an inner layer of sun dried bricks, thereby making the wall isotropic in nature. Additionally, the brick wall

NEPAL (continued)

is constructed using mud mortar and the bricks are wedge shaped rather than being cuboid. The weak mortar erodes quickly and the wedge shaped brick collapse into one another; in the event of an earthquake the brick wall can easily give way.

3) Absence of a Rigid Timber – Strut joint: The ornate and detailed timber struts that support the large over hangs of the roof do not have a rigid interlocking joinery making them weak in the event of ground movement.

4) No Damp-proof Course: The main vertical supporting posts are directly connected to the stone plinth through a mortice and tenon joint. This junction shows a clear absence of the damp proof course, making the wood weak and vulnerable over centuries due to capillary action and up-splashing of water, thus being easily crushed by an earthquake.



Shorter two tier Dega style temples survived e.g. Changu Narayan Temple



Cyasilin Mandap in the Bhaktapur Durbar Square was destroyed in 1934, reconstructed in 1990 and clearly survived the 2015 earthquake

NEPAL (continued)

5) No Ring Beams: The large vertical façades extending up to two to three levels have a clear absence of ring beams that give the brick walls the necessary tensile strength. This aspect resulted in numerous collapses.

6) Maintenance: Nepal is the 11th most earthquake prone country in the world as per the UNDP. Similar earthquakes of equal or greater magnitude strike Nepal every 80-100 years. The last earthquake struck Nepal in 1934. Buildings that were damaged during that earthquake and which were retrofitted later survived the 2015 earthquake. On the other hand, the buildings that survived in 1934 but were left unchecked succumbed to the 2015 earthquake.

7) Tall and Narrow: Tall temples with narrow bases and soft stories were the ones that collapsed during the earthquake. Their slender forms and large overhangs make them top-heavy, resulting in them being prone to topple over during earthquakes. These taller temples also lack internal floors making the walls monolithic and vulnerable to ground movements.

The above are the few reasons identified. If we as architects, preservationists, and engineers can work together on these issues, the heritage of Nepal can be more suitably reconstructed and better protected so that it may survive for our future generations.

1 Ellen Barry and Nida Najar, "Nepal's Cultural Heritage Becomes Its Scrap as Human Crisis Takes Priority After Earthquake," *New York Times*, April 28, 2015, under "Asia Pacific," accessed August 15, 2016

<http://www.nytimes.com/2015/04/29/world/asia/as-human-crisis-takes-priority-after-nepal-quake-a-nations-treasures-become-its-scrap.html>



CALL FOR SYLLABI

To all faculty who teach a construction history class or incorporate a construction history learning module in your history, design, architectural or engineering class, you are invited to submit a .pdf of your teaching syllabi to the new CHSA Research Repository to help further our collective knowledge.

Please email:
melaniefeerst@gmail.com

CORPORATE / INSTITUTIONAL MEMBERS

Please contact Executive Director Melanie Feerst if you would like to see your firm profiled in future CHSA Newsletters!

TRAVELOGUE - GLEN CANYON DAM

Melanie Feerst

Completed in 1964, the Glen Canyon Dam is the second tallest concrete-arch dam (Hoover Dam is 16 feet higher) in the United States, and was built on the Colorado River eight miles below the Utah – Arizona border. Considered one of the major engineering and construction achievements in the United States, construction was begun in 1956 with the first concrete pour in 1960. Concrete placement continued 24 hours a day until the final bucket was placed three years later. In all, it took over 400,000 buckets, each holding 24 tons of concrete, to build the dam.

Merritt-Chapman and Scott Construction (ceased operation in 1971), was awarded the contract and completed the dam and powerplant at a cost of \$245 million in 1963. In the 50's the firm had built foundations for notable bridges, including the five mile Mackinac Bridge, at the time the world's longest anchorage-to-anchorage single suspended span.

Factors considered in selecting the dam site were: the proposed reservoir basin could hold a large volume of water, the canyon walls and bedrock foundation were stable and strong enough to safely support a tall dam, and a good source of rock and sand for making concrete was located close by. The city of Page, AZ was founded in 1957 as a construction camp for the thousands of workers constructing the dam, with 7,500 residents at the peak of construction.

In 1980, seventeen years after the dam's gates were closed, Lake Powell filled completely for the first time. One of the most popular and scenic lakes in the world, there are an incredible 1,960 miles of winding shoreline and spectacular scenery available to the 2.4 million annual visitors at the Glen Canyon National Recreation Area.

Currently, the Glen Canyon Powerplant has eight electric generators which produce five billion kilowatt-hours of hydroelectric power a year, which helps meet the electrical needs of 5.8 million customers in the Western United States.

Make time for a visit to spectacular Antelope Canyon (background), a slot canyon located on Navajo Nation lands. Thanks to the Bureau of Reclamation for information on the Glen Canyon National Recreation Area and the building of the Dam.



Continuous 24 hr cement placement over 3 years



Connection detail



Bridge span

WHY RENEW YOUR CHSA MEMBERSHIP?

NEW FEATURES: Corporate Profiles, Travelogue

RESEARCH REPOSITORY - Construction History syllabi, books and articles, all located in one place on the website!

Memberships are valid January 1 - December 31 of a calendar year.

<http://chsamembership.wildapricot.org/page-1560508>

A Big Thank You to our CHSA Management Committee

On behalf of the members, a debt of gratitude is in order for all the hard work these volunteers have done for CHSA!

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(5th Biennial – Austin TX)

Benjamin Ibarra Sevilla
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FINANCE COMMITTEE

Brian Bowen

***All of us at CHSA wish you and your family
a wonderful holiday season and
a productive, healthy and happy New Year!***

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***Please send current research articles, books,
opportunities, or travelogue pieces for future Newsletters***

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