

23rd Annual conference of CIBW104 Open Building Implementation held in conjunction with the CIB World Congress

Hong Kong June 17-20, 2019

The annual conference of the CIB W104 Open Building Implementation was organized in conjunction with the 2019 Triennial CIB World Congress held in Hong Kong June 17-20, 2019. The sessions of W104 was organized by Dr. Beisi Jia, Joint coordinator of W104, Associate Professor at the University of Hong Kong, and Director of Baumschlager Eberle Hong Kong Ltd. It was supported by Prof. Amira Osman (Joint Coordinator of W104), Prof. Kazunobu Minami, Prof. Dongwei Liu, Prof Nobu-yuki Nomura and Prof. Shin Murakami. Prof. Mieke Oostra chaired the business meeting.

The conference had three sessions and a business meeting. Thirty-two abstracts were submitted; twenty three full papers and poster submissions were accepted. Fourteen papers were presented orally and published in the conference proceedings after peer review. Prof. Dongwei Liu from Beijing delivered the keynote address entitled “Research and Practice of China's Sustainable Housing Construction Mode under the Concept of Open Building.” CIB members, PhD students, academic members and practicing architects from Japan, China, Singapore, Holland, Brazil, Russia and Hong Kong presented in the paper sessions. Three posters were also mounted in the exhibition room.



1. Conference theme: Smart and interactive-- Building a Sustainable Future in Asia

Architecture is part of any human civilization, and as such extends beyond the narrow confines of technology. Technology, just like soil or bricks is the one of the resources of civilization. The questions of how to use it and why to use it must be answered before any technological implementation. But for technology to be part of culture rather than dominate it, smart-thinking from a broader perspective is as important as smart- technology, if not more so.

Asia, with the largest population in the world and with rapidly growing economies, faces great challenges of growing demand for and lack of natural resources. The rapid urbanization and intensive cultural juxtapositions in Asia bring both problems and opportunities for building a sustainable future in Asian cities. However, on the one hand, traditions of smart building in rich and diversified cultural backgrounds in developing countries have not been properly understood. On the other hand, developed economies such as Japan and Hong Kong encounter new questions – for example, how to remodel or reactivate existing building for the shrinking population and aging society.

It is in this context that **Smart Thinking** from all over the world was an addition to the dialogue in the three paper session of the 20-year old world-wide network “CIB W104 Open Building Implementation, structured around two basic ideas.

The issue of time. To ensure that buildings can endure, they must be adaptable enough to accommodate changes of uses, circumstances, and as many unforeseeable matters as possible, arising from an evolving culture during the building’s technical service period.

The issue of people. Real people stand beyond any statistics, functions or programs of use. If pluralism is the word characterizing the conceptions and the behavior of people today, no building can be satisfactory – or sustainable - without an interactive relation to ordinary people in everyday use. Collectively and individually, people look for opportunities to exercise control, that is, to change and adapt their environments in the organic, ongoing cultivation of built environment.



2. The conference program

June 18 - 14:30 – 16:00 Room Z414

Chairs: Prof. Kazunobu Minami, Prof Beisi Jia

Introduction to the Conference: Prof. Beisi Jia

- WC0160 **Keynote speech**
Research and Practice of China's Sustainable Housing Construction Mode under the Concept of Open Buildings
Dongwei Liu
China Institute of Building Standard Design & Research
- WC0172 *On-slab-piping system of toilet and its application to long-life housing in Korea*
Hyeon Jeong Yang, Soo AmKim
Korea Institute of Civil Engineering and Building Technology
- WC0107 *Next Generic Residential High-Rise - Flexible Housing Typologies and their Social and Environmental Sustainability*
Oliver Heckmann, Michael Budig
Architecture and Sustainable Design, Singapore University of Technology and Design
- WC0116 *Adequacy level of Brazilian constructive systems to the Open Building: an evaluation tool (2.0) (Video PPT presentation)*
Rosamônica Lamounier, Carolina Albuquerque
Centro Universitário Metodista Izabela Hendrix

June 19 -

11:00- 12:30 Z414

Chairs: Prof. Dongwei Liu, Prof Nobu-yuki Nomura

- WC0086 *The Long-term Strategies of Collective Residences in Extreme Water-deficient Cities of Xinjiang: Taking Hami as An Example*
Hongwu DU, Yan LI
South China University of Technology School of Architecture
- WC0023 *A Critique on the Theory and Practice of Urban Design: The Value of Open Building and Beyond*
Beisi jia
the University of Hong Kong
- WC0084 *A Comparative Study on Building Longevity Factors between Traditional Village and Urban Area in Pearl River Delta, China*
Qing WANG
South China University of Technology, State Key Laboratory of Subtropical Building Science
Beisi Jia
the University of Hong Kong
- WC0051 *The Association of Open Construction Ideas, "new economics" and "BIM" in unified (single) Systems. The Problem of Constructing JNT Systems.*
Sergey Rybakov
- WC0062 *A method to analyze the landmark's visual impact on urban built environments using saliency-maps*
Ran Xu, Haishan Xia

June 19-

14:30 – 16:00 Z414

Chairs: Prof. Shin Murakami, Prof. Nobuyuki Nomura,

WC0033 *Innovative Technologies for Sustainable and Adaptable Housing*

Kazunobu Minami

Shibaura Institute of Technology

WC0132 *Smart Open Retrofitting*

Mieke Oostra

Utrecht University of Applied Sciences

WC0112 *How VR provides Design Freedom to People yet Maintain Control by Architects*

Tian Tian Lo, Zuopeng Xiao

Harbin Institute of Technology (SZ)

WC0062 A method to analyze the landmark's visual impact on urban built environments using saliency-maps

Ran Xu, Haishan Xia

Beijing Jiaotong University, School of Architecture and Design



3. The Conference Strands – A summary of presentations

Urban typology in transformation

The conference highlighted the importance of strengthening consistency of neighborhood and building patterns in different cultural contexts. A courtyard scale is found easy to adapt to dry-hot and dry-cold climate situations and to meet security needs. The open building principles are applied as evaluation framework to analyze a number of such cases. In an example of participatory research, one paper analyzed the circulation system, the prototype of elevated public spaces in different scales and the interaction between the inside and outside of urban spaces. The paper addressed the importance of atmosphere of the public spaces. The research concluded that there is morphological difference between traditional high dense urban complexes and new ones. It demonstrated that spatial atmosphere is still the key to create walkable, accessible, and eventually sustainable cities.

To increase the future-proofing of retrofitting concepts and to avoid major problems in

the future because of difficulties to upscale retrofitting, another paper called for tenant involvement in upgrading energy performance of the current building stock. A primary observation was that residential buildings receive periodic injections of refurbishment investment, and their long-term environmental performance would result from a sequence of upgrades. The paper argued that early upgrades should anticipate and make provision for future upgrades, following the model of Open Building, even though the exact timing and nature of future upgrades is uncertain. Cases in Beijing found systematic improvement of elderly services, and renewal of the existing facilities of communal buildings is fundamental for an aging society. It suggested that long-life housing with adaptable infill, which preserves building fabric by encouraging it to adapt to change, is at the heart of housing solutions for sustainable future because it significantly reduces the waste of materials for building construction. A number of recent technical innovations showed the potential for even greater flexibility in both new and existing housing stock in Japan. Since almost all of them have limited floor heights, new technologies that enable free pipe-layout helps in the renovation of existing apartments.

Design and Construction Methodology

In Singapore alternatives to the current deterministic models have been investigated for future public high-rise housing. These are open-ended and generic in a way to adapt to diverse and unpredictable requirements. Based on Habrakens' concept of separating design tasks, a division into support- and infill systems as a strategy for a residential high-rise type was investigated and specifically adapted to the spatial constraints of cluster-blocks. In Brazil, the tool of housing evaluation allows architects, researchers, entrepreneurs, investors, builders and constructors to make combinations of different architectural types, finishing standards or development scales, in different scenarios. It defined the behavior of each layer or component as support or infill, in the proposition of adaptable buildings. A paper from Shenzhen brought insights to regarding how VR could be exploited to provide opportunities for people to have the freedom to design their living environment yet allowing architects to exercise control to the overall design outcome. New emerging information-technological platforms based experience of practices both in the world and Russia were introduced. Another research proposed a method to use a saliency model and image data to predict as well as to understand how humans perceive the landmark in a complex urban built environment from the visual cognitive point of view. A study from Korea focused on characteristics, design and construction of the wall type toilet system using a comparative analysis with those in current housing.

Understanding history of architecture

Within the Open Building conceptual framework, several historical cases from urban areas and traditional villages were compared and analyzed by the "use of levels," abundant longevity evidence and their long-lasting performance. A paper probed into the structures and elements of traditional Chinese buildings and found that components' "replaceability," a key feature of these construction methods, played an important and highly effective role in saving resources. It proposed the use of BIM to make better cooperation for designers, builders and users in the process of design, construction and maintenance phases to enhance replaceability in new housing construction

4. Business meeting : Open Building Roadmap (Chaired and recorded by Prof. Mieke Oostra)

The discussion started with a presentation of Beisi Jia with an introduction of the network, the activities of CIB W104 and the principles of OB. The discussion addressed the following issues:

- a. Bridging Open Building knowledge and the building industry around the world
- b. Strengthening the Commission

- Setting up regional Open Building commissions
- c. Increasing Impact and adding value of the Open Building approach
 - Encouraging publications, conference papers, research on practice and education
- d. Greater visibility
 - Improve functionalities of OB website. Set up interactive website platform in Facebook

4.1 The state of art of OB

Internationally there is a growing interest e.g. now with the considerations concerning a long-life housing standard in China, mirroring the experiences in Japan. Next to China and Japan, the following countries show and interest: Iran, Israel, Brazil, South Africa, Korea, Indonesia, US - The Design Council and Netherlands –network with ad hoc meetings.

There is interest from Singapore & Germany to have their own national chapters. (Heckmann). In China there is not yet one, but there are about 20 people active with OB ideas. Therefore the question rises if there should be an OB centre. This idea needs more discussion among Chinese participants.

The goals of the W104 Commission are:

- increasing awareness on OB
- support initiatives at local, regional and national level
- construct a platform of information and innovation

Recent activities:

- Steve published a book
- There is a related journal on medical care
- a writing of Steve Kendall and John Habraken will follow
- Amira Osman is writing a book
- Book on Time based architecture
- International students competition
- OB buildings published in magazine “New Architecture” in China
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The editor of the magazine “Open House” in which several articles on OB related topics appeared passed away. A decision needs to be taken there how this journal is continued. At the moment it is not clear yet how and if it is continued.

4.2 Plans for coming years

- NEW BOOK – overview of OB in different countries (editors: Wafaa Nadeem, Mieke Oostra. Perhaps extended with prof. Denise Morado and/or prof. Amira Osman as editors)
- Leaflets of the different projects (Wafaa Nadeem)
 - We concluded that there is a need to know about projects, products and related costs.
- Database (Beisi & standard office)

4.2.1 A strategy to bridge the divide between north and south & west to east

The North is looking mainly at High Tech, this is not working for the South (Nadeem). Can we collaborate as north and south? We can then show how this can be done and what this can bring. We can use the strengths of the different countries; China for example is good in manufacturing (LO Tian Tian). Nadeem coins that we should however realize that not all governments are open-minded.

4.2.2 Strengthening of W104

Improve academic network (Heckmann) : More public housing and construction methodology have more specific fields so we can approach different people.

Extension of the network is possible towards Russia – a network of about 15 people meets so no and then

4.2.3 Increasing impact and adding value

We need to get support and bring in industry and government

Top-down support is needed

Showcase projects and products nationally and internationally are necessary

4.2.4 Greater visibility

With a good platform. Examples of how this can be done referred to in the discussion were: Skyscraper.com (LO Tian Tian) and Facebook (Lau & Rovakov)

Social network – make publications notions (Russia is interested) FaceBook? We Chat? WeBor? Instagram? Telegram? Signal? Google? Microsoft?

Website is essential, there is currently one, but it is not professional, not interactive, not updated very often. It was suggested during the discussion to improve the website with a forum.

Student chapter is needed to include the next generation, although it does not exist yet. There seems interest in initiating one (especially LO Tian Tian and probably also Wafaa Nadeem)

Flexibility is THE theme at the moment. OB is abstract, should we establish this more as a label?

Singapore thinks this is important but it is a niche. Feels it is important to step out of academia and do more competitions. Who is doing design studios? And is visiting summer schools? Tian Tian has an online design studio.

Open building on the website is not clear. Dilemma is that Open Building wants to stay flexible and on the other side people want it to be more defined. It was noticed that new topics have entered the W104 theme e.g. BIM, VR, Mobile production, Urban design and Marketing. Maybe we should describe these fields and how do they relate to open building?

Minami (presented by his student) from Tokyo asks himself whether we should try to point OB down. If we provide very precise definition would it not limit the creativity of our students? People share the same spirit

but we don't have the same language and have different ideas. A lot of architects do not classify themselves as being Open Building but still use ideas related to it.

That OB is open to new insights and domains should be made clear on the website according to Tian Tian, give examples like e.g. manufacturing, social demographics. Otherwise people do not dare to include other things under the umbrella of open building.

4.2.5 Keeping contact and next

The business meetings' participants were encouraged in submitting research topics and publication plans for the next two years, to be announced in the website.

The next conference will tentatively take place in Brazil and be organized by Prof. Amira Osman and Prof. Denise Morado.



*Drafted and edited by Prof. Dr. Beisi Jia
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