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THE BIGGER PICTURE: TALLER, MORE, BETTER

Looking back at what happened in the past 10 years in the tall building world one can see that the previous decade has been the most productive ever when it comes to the construction of tall buildings worldwide. By far, most of the growth was recorded in Asia, followed by the Middle East. Knowing this, it isn’t much of a surprise that the CTBUH gladly accepted the invitation in 2008, when then newly appointed CTBUH chairman Prof. Sang Dae Kim suggested we should organize the 2011 Annual CTBUH Conference in his hometown of Seoul.

On October 10, 11, and 12, more than 1,000 tall building professionals from all over the world gathered at the CEOX Conference Center to attend a program that was chock-full of tall building information with 145 international speakers from 42 countries. One of the great things about CTBUH gatherings is that they not only bring together an international audience, but also a wide scope of expertise related to tall buildings in one way or another. Lesser architects, such as Adrian Smith, Daniel Libeskind and William Pederson, were present, but engineers, academics, urban planners and consultants also presented on their specific area of expertise on tall buildings. Even though the conference carried the subtitle of Green, Safety & Humanity, the bigger themes which surfaced the most during these three days were taller and better tall buildings.

TALLER

Simply by looking at our tall building database it is easy to realize that our tallest buildings are getting taller. The past decade has witnessed the establishment of the supertall building, a word that didn’t quite exist in tall building literature 10 years ago. This development cannot be explained by sheer rational or economic motives, but must be credited to deep pockets and the desire to establish a new and international presence for emerging cities and nations. Supertall buildings are rarely stand-alone projects. Often they present themselves as a landmark within a larger development, representing not only the area in which they are developed, but often the city or even the country in which they are built. The message of these buildings is clear: we’re ready and we’re coming up.

A number of presentations outlined that from an engineering point of view the ability to build is not as much prompted by new and revolutionary techniques, but more so the result of continuous development and refinement of existing and proven methods. But when building taller, problems can become bigger as well, such as issues dealing with the stack effect, vertical transport and mass evacuation. When it comes to constructing the world’s tallest buildings, some issues will only manifest themselves when you stumble upon them, and it requires a good amount of experience and creativity to deal with these on the spot. Luckily, many of the professionals involved with the CTBUH are quite experienced and have the a good challenge, and enjoy sharing these experiences with an audience.
MORE

A fast growing number of people moving to the city and a growing level of welfare has triggered increased pressure on the urban housing space. Especially in Asia, these numbers are so large that the issues require larger solutions. The tall building type which deals with this does not involve the showcases of the tall building world but more the kind of tall building which is typically between 20 and 40 stories tall and can be seen in large identical clusters all over Asian cities. In Seoul we witnessed that some of these buildings had big numbers on them, to distinguish them from one another.

Presentations related to these topics dealt mostly with spatial, social and cultural issues. As the Asian context is characterized by group culture rather than individual expression, large-scale housing developments, which may look bland and generic from a Western viewpoint, are appreciated as a practical solution, offering space, amenities and a sense of community. A typical product of Asian culture are groups of equally designed tall buildings with compact apartments, often placed on top of a podium housing shops, amenities, transport facilities and green space for the residents of the complex. Identity is often not derived from the individual apartment or even the tower itself, but from the complex as a whole.

BETTER

It's been pointed out a number of times before, but sustainability is a theme which everyone agrees is an important issue. But not everyone agrees on what sustainability is really all about. Luckily topics explored at the conference offered plenty of space for a variety of different interpretations. There were those presenting mechanical strategies which can be implemented in tall building projects to save energy, or even create it. Others showed how you can create a better, and hence a more productive, working environment by introducing green sky - lobbies, natural ventilation and double-skin facades.

Maybe the best way sustainability is tied into tall buildings is through their size. But because of their prominent presence, tall buildings are often drivers of innovation. Building tall often demands the best qualities of the professionals involved, as tall building also offers the opportunity for building professionals to highlight their talents. Various winners of the annual CTBUH Awards have been chosen not for their height, but for pioneering practices when it comes to topics like sustainability and urban integration.

THANKS

Looking back, we are happy to conclude that the 2011 Seoul Conference was another successful event!
The Evolution of an Idea
Adrian Smith, Partner, Adrian Smith + Gordon Gill Architecture, USA

Paradigm Shift in Tall Building Typologies with Considerations to Design & Construction Technologies: New Generation of Tall Buildings
Ahmad Abdelrazaq, Executive Vice President, Samsung C&T Corporation, Korea

Tall Buildings in Earthquake Prone Country
Akira Wada, Professor Emeritus, Tokyo Institute of Technology / President of Architectural Institute of Japan, Japan

Construction CEO’s Experience in the Construction of Raffles City Complex and Marina Bay Sands Hotel in Singapore
S. Joon Kim, Chairman & CEO, SsangYong E&C, Korea

Session Chair Jae-Hyun Shim, Professor, Sejong University, Korea

CTBUH Korea Chairman Sang Deo Kim welcomed all on the first day of the Seoul Conference as delegates gathered in the COEX Ballroom for the next three days of presentations and networking.

In the introduction, the status of current urban design thinking in China and Korea was discussed. Building tall is what both China and Korea have embraced. With their expanding urban populations, the only path to sustainable expansion is vertical. From the Asian view, this is the best green and environmental perspective. Building tall will be building for the future. The challenge is how to design tall buildings in a human scale.

One of the premier architects in the world today, Adrian Smith, presented on a history lesson of the tripod tower, starting with Mies van de ‘Rohes’, three-legged design for a tower in Berlin’s Friedrichstrasse, which was the result of a triangular site. He also broke from conventional thinking of the time and produced a glass tower with no exposed masonry. Smith continued by discussing Lake Point Tower in Chicago as a further development of the three-legged tower. It is also an extruded glass tower to maximize the available views. In addition the Nanjing Greenland Financial Center and Wuhan Greenland Tower are triangular, mixed-use towers, in discussing his own work, Smith presented the Tower Palace III in Seoul and Burj Khalifa in Dubai. In his current work, he is implementing vortex shedding on the Kingdom Tower in Jeddah and the 1 Dubai series of towers. As explored in the Burj Khalifa, designing for the forces of the wind around the towers is crucial as these towers approach one kilometer in height.

Ahmad Abdelrazaq of Samsung presented on the development of structural design in tall buildings, mostly geared toward supertall buildings. The embedded energy of a building’s structure is an important factor when considering sustainable tall buildings. An efficient structure that manages wind loads, based
upon performance design, is key. Luckily, today we can use computer technology to help us with performance based-design. We also have the technology with dampening and sky-bridges to mitigate earthquake damage to people and structures, while making the buildings look more interesting. Current monitoring systems can provide real time data of structural motions he explained.

**Akira Wada** of Tokyo Institute of Technology presented a review of the March earthquake that affected Sendai. There was major damage to midrise and low-rise buildings because of the 160-second earthquake and subsequent tsunami. The high-rises in Tokyo, especially the modern and retrofitted buildings, did not sustain damage. However, tsunamis are difficult to design for because they are so infrequent. The buildings in Tokyo with no dampening, completed in the 1970s, sustained motions for 10 minutes. The modern buildings, that do include dampening, contained vibrations for 650 minutes after the event but these were minor and dissipated without human perception. It is the human perception of motion that is unsettling to occupants.

**S. Joon Kim** of SsangYong E&C discussed Singapore projects Raffles City and Marina Bay Sands, two projects which he has been involved in as a contractor. Both had rapid construction concrete pours and fast-track construction schedules. In the Marina Bay Sands project, the concrete pumpers were pumping high-strength concrete for 48 hours straight. The architect’s design could not be compromised by construction limitations. These parameters required cooperation from the client, architect and contractor.

Added to this are the logistics of 24/7 construction and 6,000 workers on the site, along with enforcing safety. The role of the CEO is to manage working relationships, prevent time delays, quality control and find cost savings. He is a leader of a project team and the earlier this can be established in the project schedule, the better the results.
Counterpoint
Daniel Libeskind, Architect/Owner, Studio Daniel Libeskind, Architect LLC, USA

A World Apart: Diverging Paths in Tall Building Design and Safety
David Scott, Arup, Principal, USA

Before Tall Building, Beyond Urban Habitat: Development of Contemporary Architecture in Korea and its Prospect
Jong Soong Kimm, President-emeritus, SAC International, Ltd., Architects-Consultants, Korea

Session Chair Antony Wood, Executive Director, CTBUH / Associate Professor, Illinois Institute of Technology, USA

Architect Daniel Libeskind is known for his free form shapes for buildings and towers. He stated he is not playing games with form, but is incorporating it into a symbolic structure. As such, architecture is considered to be a language. The meaning of the architecture is important, especially when it comes to translating the culture through design. Important design considerations that Libeskind pointed out are the relation between tall buildings and low-rise buildings, and the introduction of light in the lower levels of building. By using free form shapes, Libeskind creates buildings which not only create an identity for the neighborhood, but the shape results in a variety of floor plans and an identity for the people living in it.

By showing a number of projects, Libeskind elaborated on these ideas. In a project for Busan, he evoked a tropical feel into a recreational environment. Through a tower project in Milan, Italy, Libeskind showed that modern tall buildings do have a place even in old historic cities. As such, they represent a new era of design and urban development. The same is true for the World Trade Center project, for which Libeskind won the competition for the design of the re-development plan. For a tower in Warsaw, he symbolized the new freedom they are experiencing from their Stalinist past by making it look like a wing, which is the symbol of freedom in Poland. These shapes are not extruded but are non-geometric and natural. The projects include community amenities along with housing units. They may reflect historical imagery but history does not end in our time; it continues.

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David Scott of Arup discussed the retrofitting of existing buildings to improve energy efficiency and water use. Both of these topics are sustainable objectives. The end result is that retrofitted buildings have an increased occupancy rate, which is highly sustainable. One type of retrofit is to insert entire modules of
kitchens and baths into existing buildings. The factory-produced modules are efficiently inserted onto the existing floors and utilities connected in the field. This is an integrated approach of architecture with engineering.

He also discussed the monitoring of building motions. Currently, this is done differently in China, Japan and the USA. It would make more sense for a common system that could be used and shared by everyone. The CTBUH could take the lead in unifying the different seismic approaches into a single system. This would include performance objectives and determining what amount of damage to structures is acceptable.

Jong Soung Kimm of SAC International introduced the audience to the history and development of architecture in Korea. Korea has a very long history of historic architecture which has survived through its temples. Since the 1960s, the country has witnessed strong modern development. In the 1970s, Korean companies started to work in the Arab peninsula, working with many American companies. Through a strong international focus, the Korean companies gained a significant amount of experience in building techniques and structural materials. Through this period, Korean architecture, engineering and construction has been able to develop into what can be regarded as contemporary Korean architecture. The organization of global events, such as the 1988 Olympics, has been influential in this process, as well. Through continuous learning and development, Korean companies are involved in some of the tallest and biggest projects worldwide, such as Samsung and its construction of the world tallest tower, the Burj Khalifa.
TECHNICAL TOURS

HALF DAY TOUR: OCTOBER 11(TUE), 14:00-18:00

Course 1 LOTTE World Tower
Course 2 IFC (International Finance Center)
Course 3 Center ONE - Bukchon Hanok Village
Course 4 Dongdaemun Design Plaza
Course 5 SK Eco Lab
Course 6 Ultra High Speed Elevator Test Tower (Hyundai Asan Tower)

As a part of the CTBUH 2011 Seoul Conference, several technical tours were held at buildings and sites around Seoul, Korea. Conference delegates enjoyed free technical tours at a number of state-of-the-art facilities including: Hyundai Asan Elevator Facility, Lotte Jamsil Super Tower, Three International Finance Center, Songdo in Incheon, Dongdaemun Design Plaza, and the Green Urban Renewal site.
**Course 1 LOTTE World Tower**

On a bright Tuesday afternoon a tour was hosted at the Lotte Jamsil Super Tower construction site. Situated east of the conference venue in downtown Seoul, the construction site was a buzz of activity of trucks and cranes. We circled from the main Songpadaero Road into the construction site. This gave us a good overview of the size and complexity of the superblock development.

The Lotte superblock contains a shopping mall and the Lotte World indoor amusement park, as well as the 556-meter-tall Lotte Jamsil Super Tower, which on completion will become the tallest building in Seoul. Lakes to the south will also be incorporated into the functionality of the superblock. Like the Burj Khalifa complex in Dubai, this development includes many functions and will be completed in phases. It will also become a city-within-a-city for Seoul, with a tall building as the landmark in the skyline for the complex.

We first visited the model in the construction office. We filled an auditorium to receive an overview of the design and construction of the tower from the construction staff. The excavation is a huge hole for the matt foundation of the tower and the foundations of additional buildings in the complex. The tower structure is a core and eight megacolumns with outriggers. The podium of the tower contains retail to compliment the other functions. Large office floor plates begin at the 11th floor and continue up to the 76th floor. As the tower rises, it begins to taper. A hotel will occupy the 80th to 110th floors as the four facades gently taper upwards. An art gallery will occupy the floors above the hotel. The top floors 122 and 123 will contain a Sky Cafe and Observation Deck, respectively. The peak will form twin points for a distinctive silhouette in the skyline. The tapered shape and pristine form are trademarks of the designer, William Pedersen of Kohn Pedersen Fox. In his conference presentation he explained this preference for simpler more elegant forms for supertall buildings.

We enjoyed the views from the observation deck high above the excavation opening. At this time, the matt foundation and bases of the megacolumns have been placed. To the east of the tower foundation is the podium base of the superblock for the other buildings within the complex. Temporary roadways and ramps have been constructed within the excavation to provide access for the material-laden delivery trucks. The structural engineer for the tower, LERA Director of Design Leslie Robertson, joined us on the tour along with CTBUH award winner Akira Wada. LERA Managing Partner Saw Teen See provided insights into the tower’s structural aspects. Another supertall that KPF and LERA have recently designed together is the Shanghai World Financial Center. At 556 meters, this new Lotte Super Tower will establish Seoul as one of a handful of cities worldwide with supertalls.
Council on Tall Building & Urban Habitat (CTBUH)

The Council on Tall Buildings and Urban Habitat, based at the Illinois Institute of Technology in Chicago, is an international not-for-profit organization supported by architecture, engineering, planning, development, and construction professionals, designed to facilitate exchanges among those involved in all aspects of the planning, design, construction, and operation of tall buildings.

Founded in 1969, the Council's mission is to disseminate multi-disciplinary information on tall buildings and sustainable urban environments, to maximize the international interaction of professionals involved in creating the built environment, and to make the latest knowledge available to professionals in a useful form.

The CTBUH disseminates its findings, and facilitates business exchange, through: the publication of books, monographs, proceedings and reports; the organization of world congresses, international, regional and specialty conferences and workshops; the maintaining of an extensive website and tall building databases of built, under construction and proposed buildings; the distribution of a monthly international tall building e-newsletter; the maintaining of an international resource center; the bestowing of annual awards for design and construction excellence and individual lifetime achievement; the management of special task forces/working groups; the hosting of technical forums; and the publication of the CTBUH Journal, a professional journal containing refereed papers written by researchers, scholars and practicing professionals. The Council actively undertakes research into relevant fields in conjunction with its members and industrial partners, and has in place an international "Country Representative" network, with regional CTBUH representatives promoting the mission of the Council across the globe.

The Council is the arbiter of the criteria upon which tall building height is measured, and thus the title of "The World's Tallest Building" determined. CTBUH is the world's leading body dedicated to the field of tall buildings and urban habitat and the recognized international source for information in these fields.

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