Book of Abstracts

A gateway to the multi-disciplinary presentations given at the CTBUH 10th World Congress

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Core Congress Posters
Prasetyo Adi, CTBUH Regional Representative; Managing Director, PDW Architects, Jakarta; Tropical Tall Buildings: The Indonesian Experience
Fahad Alotaibi, Head of Architecture, Department Qassim University, Buraydah; Vertical Urbanism in the Gulf
James Antell, Regional Practice Leader, Fire Protection Engineering, Telgian Engineering & Consulting, Chicago; Fire Safety Implications of Stack Effect in Tall Buildings: Historical Perspective & Future Trends
Matthias Bezabeh, PhD Candidate, University of British Columbia, Kelowna; Performance-Based Wind Design of Tall Buildings with Explicit Consideration of Damage Accumulation
Giorgio Bianchi, Director, Robert Bird Group, London; Opportunities and Challenges of Building Taller with Modular Construction
Brian Breukelman, Principal, Sector Leader, Buildings, Stantec Ltd., Calgary; The Post, Present and Future of Building Vibration Control
Matthew Burke, Associate Director, ADP Consulting, Sydney; The Evolution of Thermal Comfort: Saving Money Sustainably
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Nirodha Gunadasa, Chairman, Archedium (Private) Limited, Colombo; Advancements in Future Parametric Design Thinking: What Kind of Urbanism Would it Generate?
Tony Johnson, Executive Director, Post-Tensioning Institute, Detroit; The Future is Concrete: How Post-Tensioning Is Transforming our Tall Buildings
Neel Khosa, Vice President, AMSYSCO, Chicago; History of Unbonded Post-Tensioned Concrete in Skyscrapers
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Introduction

On the 50th anniversary of the Council on Tall Buildings and Urban Habitat’s founding, the CTBUH 10th World Congress returns to the Council’s home: Chicago. Focusing on the theme 50 Forward | 50 Back, the Congress explores the most significant advancements in tall buildings and cities from the last 50 years, whilst inquiring into the future of our cities 50 years from now. This event thus represents a critical reflection on both the skyscraper typology and urban development as a whole, by marking their trajectory to date, and considering the evolutions that must take place to accommodate a dynamic and uncertain global future.

Fifty years ago, in 1969, plans were put forth to build the Sears Tower in Chicago, a 442-meter skyscraper that would take the title of “World’s Tallest Building” when it completed five years later. That same year, the New York City Planning Commission released the Plan for New York City, a six-volume tome that sought to refocus attention on neighborhood-level improvements, as a way to soften and humanize the ill effects of numerous urban-renewal schemes that had decimated cities for the previous two decades. The tension between human-centric and technologically-advanced design was brought into sharp focus at this time—but, arguably, has never truly been resolved.

Since that time, cities have grown exponentially, all incorporating—in some way—the lessons and technologies of those that came before them. Whereas only 37% (1.3 billion) of the global human population lived in urban areas in 1969, today that figure has increased to 55% (4.2 billion), with further urban growth projected at 68% (6.7 billion) by 2050. Close to 90% of this growth will take place in Asia and Africa. But not all urban areas are destined for unabated growth. Those vulnerable to natural disasters or severe economic instability may see major population losses, as residents seek out locations with fewer crises and improved education, employment opportunities, health services, and housing.

On a building scale, the manifestation of the contemporary skyscraper is a collective accomplishment—one that has experienced several wholesale evolutions over time. Whereas back in 1969, at the formation of the CTBUH, the tall building was predominantly a technical challenge, now it is, arguably, more of a social challenge—how does it fit in with, and enhance, society? With the technological barriers towards height now largely addressed, an emphasis is being placed on making more humane, smarter, greener, more efficient skyscrapers that are better integrated with their cities, and better stewards of the urban environment. But much still needs to be done.

We thus stand at a critical juncture in time, amidst major change in the typological status of tall buildings, the cities they call home, and the people that inhabit them. The 10th World Congress, Chicago, directly addresses critical issues in the future progression of our cities, drawing the most important lessons from the past. All relevant issues—including urban planning and infrastructure; smart technology/automation; resilience and climate change; passive environmental strategies; tall timber structural systems; modular construction; inter-/intra-building transportation; the future of the workplace; building modeling; and many others—will be explored.
Why Chicago

With one of the longest histories of any city in building skyscrapers, Chicago is perfectly positioned to contemplate the integration of tall buildings into our urban fabric—from both a technical standpoint and a socially responsible one. Chicago was a hotbed of skyscraper innovation in the 1880s, resulting in advances in many building technologies, from skeleton framing to foundations. In 1974, the Sears (now Willis) Tower took the title of World’s Tallest Building—and held it for nearly a quarter of a century. With a world-famous skyline that contains buildings like the John Hancock (now 875 N. Michigan) and the Aon Center, and an eponymous architectural style that emphasizes height through vertical lines, Chicago’s architectural signature is unique. Furthermore, the United States’ third-largest city borders the country’s third largest freshwater lake—the massive Lake Michigan—granting Chicago the potential to lead urban environmental stewardship policies as climate change threatens resource access.

When the Council on Tall Buildings and Urban Habitat relocated from its former headquarters in Bethlehem, Pennsylvania to Chicago in 2004, it was with the knowledge that the Windy City’s capacity to push architectural boundaries helped percolate the skyscraper typology over 100 years prior. It is with this same awareness that the CTBUH chose its home city for the 2019 World Congress, 50 Forward | 50 Back in celebration of its 50th anniversary, through a conference that examines the past to inform riveting visions for sustainable cities of the future.

About this Book

This collection of abstracts serves as a gateway to the presentations given at the CTBUH 10th World Congress, which took place in Chicago from 28 October to 2 November 2019. The presentations upon which these abstracts are based explore critical urban topics that are equal parts retrospective, contemporary, and future-forward. The discussion embraces every discipline, from urban planning to security, architectural design to vertical transportation, real estate development to technology solutions.

We hope you enjoy reading through the abstracts and are encouraged to visit the web link for each presentation, where you can find more information on the speaker, subject, and the actual presentation.

Footnotes:

1. The Skyscraper Center, CTBUH
3. 2018 Revision of World Urbanization Prospects, United Nations
4. The Council holds at least one conference per year and a world congress every five years in an active tall building city around the world. Larger in scale than the annual conferences, world congresses are substantiated by paper-based proceedings and encapsulate a geographic audit of the best developments happening in each region around the world.
Learning from Tall Building History

Synopsis

Tall buildings can measure more than simply height—they are indicators of other factors too, from boom-and-bust cycles within their home cities, to dominant aesthetics and technologies of decades long-past. Exploring tall buildings as a tool to contextualize their surroundings is the crux of this session, and unfurls into pointed discussions on how and why we calculate the world’s tallest buildings, highlighting an often-secondary figure: the world’s biggest buildings in terms of gross area and what that says about the communities they are most prevalent in. Connection between dynamic solutions of the past and how they will evolve into the future are also discussed with a focus on how vertical long slots, which reduce wind loads, might be used in skyscrapers several years out.

Session Chair

Matthew Watkins
Executive Vice President, Marketing and Communications
thyssenkrupp
Dallas

Matthew (Matt) Watkins leads marketing and communications operations for thyssenkrupp. He is responsible for product development, strategic pricing, demand generation, internal and external communications, branding, sales and marketing collateral as well as overall customer satisfaction strategy. He was promoted to vice president of construction and modernization sales for the US and began serving in his current role in 2011. Watkins earned a BS in Marketing from the University of Arizona in 1993 and an MBA from Dallas Baptist University in 2008. He is married and has two sons.
Keeping the Past Alive: Contextualizing Tall in the Cityscape

Abstract

The Chicago Architecture Center (CAC) is viewed as the leader in architecture tour-making, drawing more than 450,000 tourtakers every year. At the heart of this work is a commitment to concise storytelling and a deep understanding of the advantages afforded by informal learning settings. Not surprising, two of the CAC’s most popular tours center on story of Chicago’s tall buildings, specifically Early Modern Skyscrapers and the Rise of Modernism. How we determine Chicago’s role in pioneering the design and development of early skyscrapers is a complex balancing act, at once mythologizing the city’s bravura and its vanguard designers, while also seeking to correct misinformation.

Part of what keeps the early tall buildings in a state of good repair and active use is the belief that they contain secrets from (and bear witness to) the city’s boom periods. This sense of larger cultural awareness is an essential pretext that gets people interested to further explore the city’s architecture. CAC teaches its guests how to “read a building,” an exercise which supports the most enduring facts about a building: how it stands up, why it is designed in the way it is; what functions it supports; what public message it delivers; the family of buildings to which it belongs; and points of debate.

In Chicago, the emerging master narrative has been so successful it has fueled several attempts to secure UNESCO status for the city’s LaSalle and Dearborn street corridors. More important, though, is that CAC tourtakers often transfer this learning and take a deeper look at their own communities and the stories their buildings are communicating.

Keywords

Architecture History, Urban Design, Storytelling, Tours, Public Education

Lynn Osmond

President & CEO
Chicago Architecture Center
Chicago

Lynn Osmond serves as President and CEO of the Chicago Architecture Center (CAC). Since 1996, Osmond has continually expanded CAC’s reach through tours, exhibitions, programs, and youth education—efforts that rank the CAC among Chicago’s top 10 cultural institutions. In 2018, she led the creation of its 20,000-square-foot home that moved Chicago architecture to the center of the city’s cultural conversation. A passionate advocate for why design matters and for architecture’s leading role in determining the future of cities, Osmond was awarded the 2019 AIA Illinois Richard Nickel Award for (non-architect) citizens who lift up architecture and the profession.
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**Panel Discussion**

**High-Rise Design Drivers: Now to 2069**

A view of New York City from outer space. © NASA (cc by-sa)

**Synopsis**

The core factors influencing the design and development process for tall buildings have evolved significantly over time in response to changing user needs, cultural shifts, emerging technologies, in addition to seemingly intractable issues such as climate change and economic uncertainty. Professionals from a diverse set of disciplines will discuss their views on the drivers for tall building design 50 years in the future, and how technologies and design approaches will need to evolve to address both current and future needs.

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**Shelley Finnigan**

Global Technical Sales Engineer, Head of Technical Sales & Marketing

ArcelorMittal

Chicago

Shelley Finnigan serves as Global Technical Sales Engineer and Head of Technical Sales & Marketing for ArcelorMittal, a leading steel and mining company. She draws on 11 years of experience in structural engineering, marketing and business development to guide the technical marketing and sales efforts of a team of engineers in the Americas. In addition, Finnigan serves as a liaison for the international community, advising project owners and their design teams on methods of increasing design efficiency when using ArcelorMittal’s unique products and materials. A licensed structural engineer in Illinois, Finnigan holds an MA and a BA from Purdue University.
Kyle Bernhardt is the Director of Building Design Strategy at Autodesk. Working with customers and his team, Bernhardt helps to shape the business strategy that allows Autodesk subscribers to realize the Future of Making. Previous to his current role, Bernhardt was a long-time member of the Revit and BIM 360 teams, leading product management for BIM 360 Design, among other products in the BIM segment. A self-professed “BIM dork”, Bernhardt is endlessly curious how technology can help the AEC community to meet the challenges of tomorrow’s planet.

Agnaldo Santos is the research and development manager at Schindler Elevator Co. His diverse technical background and experience includes mechanical engineering, production process, innovation management, and project management. In 2017, he received his master’s degree in architecture at Sao Paulo University, where he still maintains an interface with academic topics. Santos has more than 30 years of experience in the research and development area, working for different market-leading companies, including significant experience in managing resources internationally.

Dominic Bettison joined WilkinsonEyre in 1991. He has been involved in the design and construction of many of the practice’s key projects, across commercial and residential sectors, with a particular emphasis on tall buildings. Bettison is currently leading a number of high-profile, international commercial schemes, including CIBC Square, Toronto. This landmark development features twin 54-story office towers connected by a skypark over the Union Station rail corridor. In addition, Bettison led the design of the 330-meter Wuhan Qiaokou tower and the mixed-use BeiYuan in Beijing, which is composed of six office and residential towers, currently under-construction.

Architect Juliane Wolf designs and advocates for built structures that simultaneously serve communities and their environments. A Design Principal and Partner in Studio Gang’s Chicago office, Wolf brings expertise in sustainable public spaces, complex visitor-serving organizations, towers, and large-scale, international projects. Over the past 10 years, Wolf has led some of the studio’s most celebrated projects, including Writers Theatre and Vista Tower, which broke ground in Chicago in 2016. Currently leading cultural and high-rise projects across the Americas and Europe, she also serves as the Deputy Lead Designer for the O’Hare Global Terminal, the studio’s largest project to date.
First Skyscrapers | Skyscraper Firsts Symposium

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First Skyscrapers, Part I

Synopsis
The first two sessions of the Symposium seek to separate popular myth from settled scholarship in the debate over “the first skyscraper.” Each presentation provides a formative thesis about the type of criteria that should be set when determining which buildings are to be considered as “firsts.” Some venture further, proposing a candidate for the “first skyscraper” title based on the criteria set forth. The merits of all will be considered in the final panel.

Session Chair

Geoffrey Baer
Producer & Program Host
WTTW
Chicago

Geoffrey Baer is a seven-time Emmy-winning Public Television writer, producer and program host specializing in architecture and Chicago history for station WTTW. Nationally, he hosts the PBS primetime series “10 That Changed America” about the built environment across the country. In other national programs he has profiled architects like Robert A. M. Stern and Michael Graves, and featured the saving of Mies van der Rohe’s Farnsworth House. Baer has been a docent for the Chicago Architecture Foundation since 1987 and has been honored by AIA Chicago, the Society of Architectural Historians and the American Society of Landscape Architects.
The "First Skyscraper" in the History of Modern Architecture

Abstract

This presentation examines the various candidates put forward as the "first skyscraper" within history of modern architecture, along with the reasons for their selection by historians, from the origins of the skyscraper down to the present day.

Critical to the choice of "first" is the definition of "skyscraper." Consequently, the presentation explores historians’ methods of defining the skyscraper through the writings of Francisco Mujica, Carl Condit, Winston Weisman, J. Carson Webster, Rosemarie Haag Bletter, and others. Second, the presentation examines each historian’s choice or choices of the "first skyscraper" and the arguments for their selection. Finally, the presentation contextualizes the definitions and choices within the larger trajectories of modern and postmodern architecture. In doing so, the aim is to provide a historical context for the nominations of a "first skyscraper" or a "skyscraper first" presented by the participants in the symposium.

Keywords

Modern Architectural History, Skyscraper, Construction

Gail Fenske
Professor of Architecture
Roger Williams University
Providence

Gail Fenske is author of The Skyscraper and the City: The Woolworth Building and the Making of Modern New York (University of Chicago Press, 2008) and several essays on the skyscraper in scholarly books, among them Skyscraper Gothic (2017), The American Skyscraper: Cultural Histories (2005), and The Landscape of Modernity (1997). She is currently at work on the book "Skyscrapers" for the Library of Congress and a skyscrapers bibliography for Oxford University Press. She is Professor of Architecture in the School of Architecture, Art & Historic Preservation at Roger Williams University, and has held visiting professorships at Wellesley and MIT.
On the 50th anniversary of the Council on Tall Buildings and Urban Habitat’s founding, the CTBUH returned to the Council’s home: Chicago, for the 10th World Congress. Focused on the theme 50 Forward | 50 Back: The Recent History and Essential Future of Sustainable Cities, the Congress explored the most significant advancements in tall buildings and cities from the last 50 years, and envisioned our cities 50 years from now.

This collection of abstracts serves as a gateway to the presentations given at the CTBUH 10th World Congress, which took place from 28 October to 2 November 2019. The presentations upon which these abstracts are based inquired into a more sustainable future for our cities, considered the most important tall building innovations from the past, and expounded upon the current approach to a more human-scaled urban habitat.

We stand at a critical juncture in time, amidst major change in the typological status of tall buildings, the cities they call home, and the people that inhabit them. These abstracts represent a critical reflection on both the skyscraper typology and urban development, by marking their trajectory to date, and considering the evolutions that must take place to accommodate a dynamic and uncertain global future.

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