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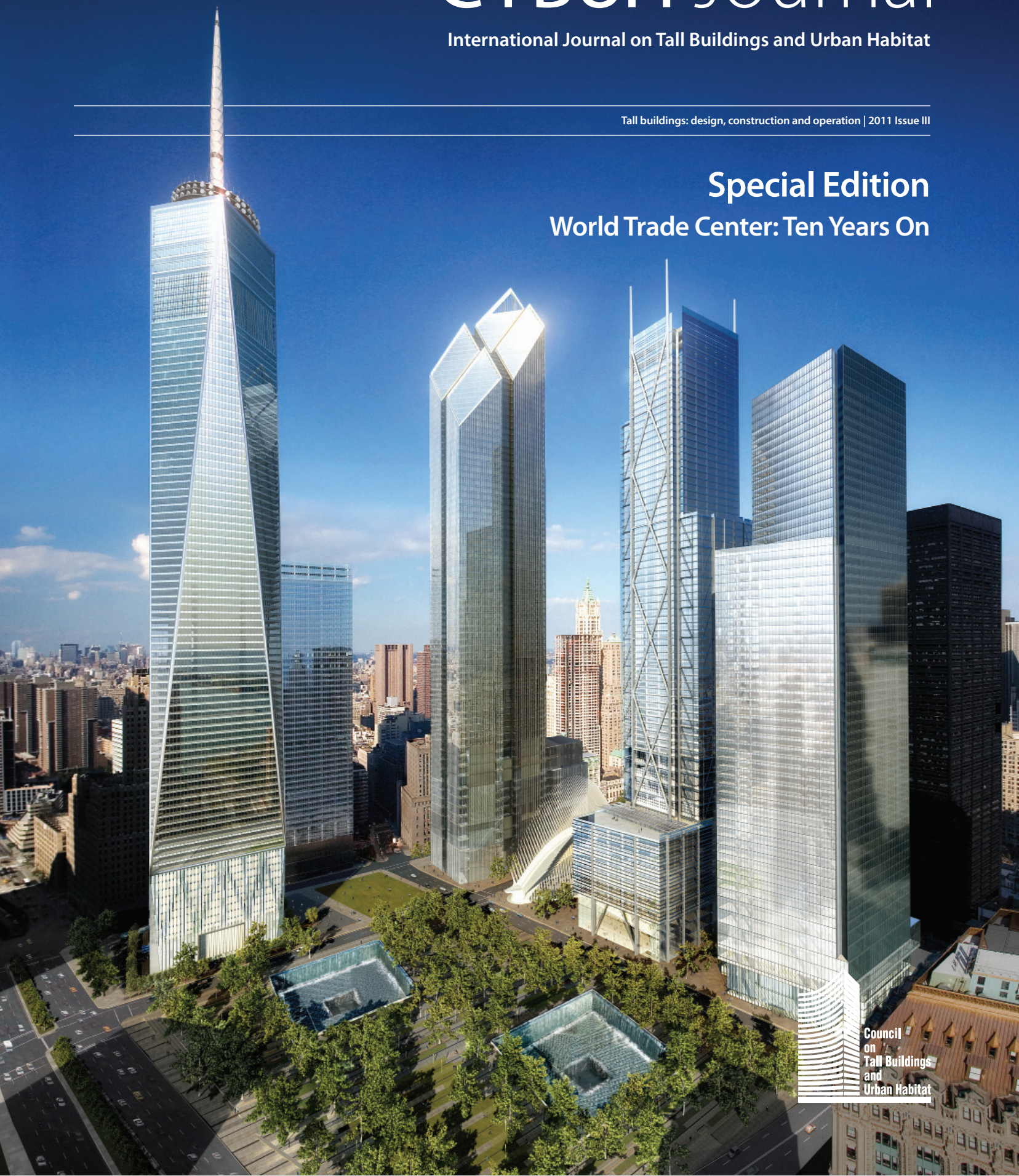
## Special Edition

## World Trade Center: Ten Years On



Council on Tall Buildings and Urban Habitat

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"It is nearly impossible to predict when the World Trade Center site will be fully rebuilt and occupied. As it is already gradually becoming part of the New York urban context, it can be argued that there will never be one definitive moment of completion."

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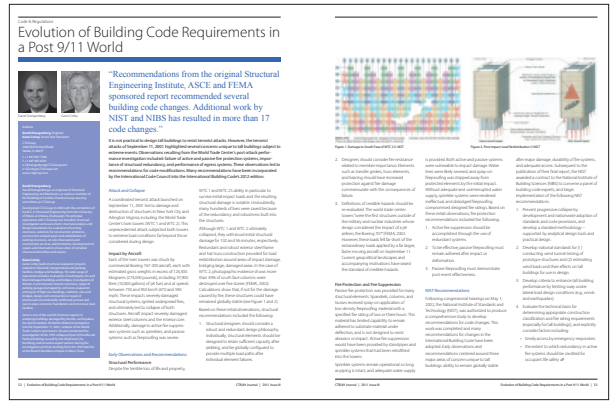
Evolution of Building Code Requirements in a Post 9/11 World

"Recommendations from the original Structural Engineering Institute, ASCE and FEMA sponsored report recommended several building code changes. Additional work by NIST and NIBS has resulted in more than 17 code changes."

"The WTC showed that we lack an adequate definition of competence… What we truly need is to legislate competence, not standardized solutions."

Jose Torero, page 36

# Talking Tall: The Global Impact of 9/11

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"All memories fade over time, although 9/11 will go down in history as one of the most cynical attacks outside of a war. Humans, as New Yorkers showed post 9/11, continually show their amazing ability to dust themselves off and get on with life, which must really frustrate the forces of darkness."

An interview with CTBUH Country Representatives by Jan Klerks, CTBUH Communications Manager/Journal Editor

Just as many Americans still remember exactly where they were when they heard the news that US president John F. Kennedy had been shot, most people will likely remember what they were doing on September 11, 2001. Social media was not as developed as it is nowadays, but nonetheless, the collapse of the Twin Towers of the World Trade Center in New York City was news that quickly spread and shocked people all around the world. In this article the Council has delved into its international representation, to ask our country representatives how these events have influenced tall building development in their respective countries in the past 10 years.

Japan's immediate response was to launch an investigation. The Council's Japan Representative Masayoshi Nakai of the Takenaka Corporation commented: "Following the events of 9/11, a Japanese risk management consultancy firm conducted a study to assess the chances of three disastrous events related to supertall buildings:

1. a plane being hijacked given the various types of anti-hijacking policies in other countries
2. a large-scale fire leading to building collapse
3. an aircraft crashing into a building, based on the actual conditions of aviation administration in each country.

Figure 1.Warsaw city © Jan Klerks

In 2004, the study concluded that the chance of any of these events happening in any of the major cities in Japan was remote."

A number of countries did **not** have a particularly **active** tall building industry in the days of 9/11. Juneid Qureshi of Meinhardt Singapore explains: "Until the recent completion of the 68-story Bitexco Financial Tower, Vietnam had been rather modest when it comes to tall building development. As such the events of 9/11 had a relatively small effect on the industry in Vietnam at the time." Turkey Representative Hatice Sozer, of Istanbul Technical University, reports a similar experience in Turkey: "The event actually did not directly affect the high-rise industry in Turkey because, in contrast to today's environment, there were not many tall buildings. Now the tall building industry is becoming increasingly active, even after the economic crisis. Political and economic developments, such as the development of oil prices, have had a far greater impact on Turkey's tall building environment than the events of 9/11."

A country's **economic forces** being more influential than emotional issues associated with 9/11 is something Ryszard Kowalczyk, of Bialystok University of Technology, observed in Poland. "The destruction of the World Trade Center gave opponents of tall buildings in Warsaw new arguments to stiffen their resistance. However, at the time of 9/11, a construction boom had already begun as a result of a strong Polish economy creating a big demand for grade-A office space . This proved to be a strong factor, and the arguments against tall buildings were discussed but quickly rejected," commented Kowalczyk (see Figure 1).

Seven months after 9/11, the Italian tall building world had to absorb the impact of **a similar event on** a smaller scale. On April 18, 2002, a small plane crashed into the upper floors of the Pirelli Tower in Milan (the motive behind the event is still unclear). Country Representative Dario Trabucco, of IUAV University of Venice, said: "As far as Italy is concerned, I would say that 9/11 has not affected the perception of tall buildings very much. Our own '4/18' on the other hand has had a significant impact since it showed that not just organized terrorists are a threat, but that tall buildings can be a targeted for anyone seeking a stage to make a point" (see Figure 2).

In some countries**, land scarcity** has proven to be such a strong driver for tall buildings that there simply is not much room for emotional considerations, Juneid Qureshi comments: "The events of 9/11 have not had an unduly adverse impact on the perception of tall buildings in Singapore. Given our land scarcity, building tall is not an option but a necessity. Therefore, following the events of 9/11, industry professionals have taken a pragmatic approach to adopt additional, and sometimes restrictive security considerations, as an unavoidable fact of life that must be managed. This has made building professionals consider security aspects as key elements in the design process and implement appropriate measures from the concept design stage of a project."

Philippine Representative Felino Palafox, of Palafox Architects, pointed out the same argument, and also mentioned an interesting cultural response: "From a social point of view, the response has been to build no more twin towers. Feng Shui believers feel that twin towers bring bad luck, as they resemble two candles for the dead during a wake."

After the tall building world realized what had happened, much attention was focused on issues related to building **security**, and of course the **structural safety** of tall buildings. Some of these discussions focused on the structural material. Austria's Ronald Mischek of Mischek Ziviltechniker said: "In terms of construction, it was pointed out in Austria that

Figure 2. Pirelli Tower after plane crash in 2002 © Marcel

there is a difference between the technical standards in America and here in Europe. The public was satisfied with the argument that a building with a concrete structure, which is the case with most tall buildings in Austria, would have responded differently than a building with a steel structure. As such it was suggested that a concrete building might not have collapsed in similar circumstances. Obviously this opinion was the interpretation of the general public, and not the opinion the country's structural engineers. Due to 9/11, it has become even more typical for the public to think negatively about steel construction in high-rise buildings."

The best way to ensure that buildings will not collapse as a result of an extreme event is through the **prevention** of those events. Anyone who has entered a hotel or office

## ...debris

"The debris [from the WTC] was dumped into the Hudson River, beginning what would become the biggest landfill in the city's history, even dwarfing the tons of dirt and rocks that had to be disposed of when the subways were built sixty years earlier."

*Bill Harris in his book "The World Trade Center. A Tribute," 2001: 49–51*

tower in the past ten years must have noticed a more tightened security policy. Such are the experiences of PDW Architects' Tiyok Prasetyoadi of Indonesia. "The effect of the events is most evident in the lower part of tall buildings. First, in the planning of every development the security requirements are more stringent, especially for buildings occupied by multi-national companies. Second, the design has to include a space to inspect cars before they enter the building premises. Before entering the building lobby, there are now X-ray security checks, especially in international hotels and offices. Additionally, some projects are now being designed with blast-proof windows on the ground floor level."

Hatice Sozer also mentioned the topic of **emergency preparedness:** "9/11 raised issues in Turkey regarding preparedness and recovery, such as back-up data storage and information processing repositories. Many companies re-evaluated their ability to respond to these kinds of emergencies, in an attempt to avoid haphazard responses."

If there is one single place that the general public has noticed a change in security policy, it is most definitely the airport. New Zealand's Representative Simon Longuet-Higgins, of Beca Group, commented on the matter saying: "The people of New Zealand are travelers and probably the most noticeable adjustment we have had to cope with is the increased security at airports. Anecdotally there has also been a move to travel West rather than East when heading for Europe to avoid the hassles of travelling through the US with the added visa and border security issues this now entails."

An interesting effect of **air travel** and tall buildings is observed in Indonesia by Tiyok Prasetyoadi. "The military airport in East Jakarta is increasingly becoming involved in building height regulation. This affects tall building development in Jakarta's Central Business District, which is within 15 kilometers (9.3 miles) of the flight zone. Our quick study shows that building heights will be limited to between roughly 150 and 200 meters (500 and 650 feet), depending on the relative position to the airport. This regulation is contrary to several other urban development laws, which allow buildings of significantly greater height."

Instead of shaping their own **code**, some countries look to areas that have well-established regulations of tall buildings. "Turkey has borrowed most of their high-rise related code from the USA or Europe. Any changes in their codes were adapted here as well," comments Sozer. Felino Palafox mentioned that the Philippines are waiting for the USA to change their codes. "It's a challenge to convince clients to spend more money on the anticipated new requirements."

**Tall building code,** or rather the lack of it, is a relevant issue in Russia. "Perhaps more dangerous than terrorism is the lack of dedicated codes for tall buildings. The only document that currently regulates high-rise development in modern Russia is a set of temporary regulations and standards for the design of mixed-use high-rise buildings and complexes in Moscow, which was adopted in late 2005 as regulation MGSN 4.19-2005," commented Country Representative Elena Shuvalova, of the Lobby Agency. Shuvalova continues: "This document currently serves as the guideline to other regions of Russia where tall buildings are being built. I consider the events of 9/11 to be of eminent importance to Russia because it forced us to think about developing new technologies and shaping new regulations and requirements. The lack of federal and regional regulation in the sphere of high-rise construction makes our authorities very cautious about allowing projects, and causes them to cancel many of the more ambitious schemes."

A less stringent but equally relevant strategy is to compose **guidelines** instead of code, as reported by Juneid Qureshi: "The Ministry of Home Affairs has published comprehensive guidelines in 2005 and 2010 for enhancing building security in Singapore as part of the effort to put in place the necessary measures and infrastructure to protect the city. The guidelines are a compilation of international best practices in building security which present detailed practical and cost-effective security measures and building design considerations that could help lessen the severity of a terrorist attack. These recommendations cover in significant detail a wide range of issues related to planning, design and construction of tall buildings. While it is not mandatory to implement the recommended measures, the guidelines provide a list of options of good security practices and considerations to help building owners and professionals implement pragmatic and practical security procedures, physical protection concepts, and security technology."

## Concluding considerations

Ten years is a good amount of time to reflect on the events of 9/11, draw rational conclusions from it, and **move on.** Some of the reflections have a more philosophical character, such as Ryszard Kowalczyk's comment: "Unexpected attacks through unusual means really are the exception." Kowalczyk continues: "It can always be argued that there is more to be done politically in order to prevent terrorist attacks than in the field of architecture and civil engineering." The industry has learned an important lesson and come to the understanding that, as Ronald Mischek puts it, "You cannot build a tall building with a 100% guarantee that nothing will happen."

A deeper meaning of 9/11 and the international response is represented by a quote from South Africa Representative Alistair Collins: "All memories fade over time, although 9/11 will go down in history as one of the most cynical attacks outside of a war. Humans, as New Yorkers showed post 9/11, have time and time again shown the amazing ability to dust themselves off and get on with life, which must really frustrate the forces of darkness. This resilience was evident when, a year or two after 9/11, we surveyed the occupiers of a number of London's tall buildings and found that the vast majority of occupants felt safe in them. After a short and appropriate appraisal of the typology, the industry has now established a proper perspective on tall buildings, and the number of these projects continues to increase in the post 9/11 world, serving as a firm answer to terrorists everywhere." ■