

IHA 2010 Background Information

Frankfurt, 30 August 2010



Studio Gang Architects, Chicago: Aqua Tower Chicago, USA

Developer: Magellan Development Group, Chicago

Height: 262 meters

Storeys: 82

Completion: 2010

Use: Apartments, hotel, retail

Photo: Steve Hall © Hedrich Blessing

Located in the heart of downtown Chicago, with its 82 storeys the 262-meter-high Aqua Tower brings together 736 rented or owner-occupied apartments, a hotel and retail space. The shell of the residential tower brings to mind the motion of waves, and results from the dynamic formal interplay of jutting balconies. Their shape varies from storey to storey, the product of the interaction of lines of vision, shading, not to mention the size and type of apartment. One special attraction of the building is the green roof terrace which boasts an outdoor pool, running track, gardens and yoga terrace. Covering 7,000 square meters, it numbers among the largest roof terraces in Chicago.

As a 'topographic tower' the building responds directly to its environment and the design must be seen as an answer to a series of site-specific criteria. On the basis of a study on solar radiation, the tower was positioned in an East-West alignment to maximize the solar energy generated in the winter months. By contrast, the balconies on the south side provide more than adequate shade for the apartments in the summer. The design of the facade was preceded by similarly detailed model studies on seasonal sun patterns, in line with which it makes use of highly efficient glazing to further optimize energy use.

In addition, comprehensive wind tunnel experiments were conducted to examine the high-rise for sway and other movement. The irregularly shaped balconies that jut out by up to four meters act essentially to interrupt the wind loads. They disperse the winds, making it impossible for a strong suction motion or air current to arise, and the balconies can therefore also be used when there are strong winds.

Jury-rating (extract):

"The jury was taken by the very successful sculptural surface treatment created to clad a conventional, flexible box while likewise fulfilling clear functions. The Aqua Tower features superlative balconies and the views afforded by floor-to-ceiling glazing that double up as solar shading. It creates a very strong identity despite not being exceptionally high."

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Skidmore, Owings & Merrill LLP, Chicago: Burj Khalifa Dubai, UAE

Developer: EMAAR Properties PJSC, Dubai

Height: 828 meters

Storeys: 163 (usable), 206 (in total)

Completion: 2010

Use: Hotel, apartments, offices

Photo: SOM / Nick Merrick © Hedrich Blessing

The Burj Khalifa was conceived as the tallest building in the world and as an Arabian superlative. Over 200 storeys high, it actually posts a triple world record: It is the highest building, has the tallest spire and features the highest inhabited storeys. The design draws its inspiration from the geometry of a desert flower and the structures of Islamic architecture.

The Burj Khalifa, which is visible from well beyond Dubai itself, forms the center of the new *Dubai Downtown* district. It is based on a Y-shaped layout that then tapers upwards. Three wing-like structures are arranged around a central core. As the height progresses, the 'wings' of the upward spiraling tower taper back so that the skyscraper becomes ever more slender as it grows taller and tapers off into its pointed tip.

The tower was developed as a high-performance building that would withstand the desert heat and moisture. A highly-efficient outer facade system consisting of aluminum and stainless steel panels and anti-reflective high-performance glass ensures the building can withstand extreme temperatures during the summer months. High-strength concrete was the primary material used for the structural system. The foundations consist of a 3.7 meter thick high-performance reinforced concrete slab, which rests on supports anchored at a depth of 70 meters.

The Burj Khalifa is an icon of technical development and by virtue of its size represents a new type of high-rise. Given its sheer height and mixed uses, the tower can be read as a vertical city: A hotel is located on the first 40 floors, apartments and private luxury residences with a Sky Lobby are located in the middle, while office space extends up to the 155th floor, above which the mechanical service floors are positioned. At a height of 442 meters it then offers the world's highest open-air observatory open to the public. Similarly, the 56 elevators that can reach speeds of 60 kilometers an hour underscore the building's unique properties.

Jury-rating (extract):

"The renowned Burj Khalifa, the highest of the high-rises, not only stands out from among the five finalists for its sheer height, but also for the significant technological advances made in designing and developing it. Also, it is a singular achievement in that it constituted a new type of high-rise for it comprises a small vertical city for 10,000-15,000 persons, while likewise creating an icon of global stature."

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Frankfurt, 30 August 2010



Tange Associates, Tokyo: Mode Gakuen Cocoon Tower Tokyo, Japan

Owner/Developer: Mode Gakuen, Tokyo

Height: 203.65 meters

Storeys: 50

Completion: 2008

Use: Education

Photo: © Horiuchi / Shin Shashin Kobo

Boasting 50 storeys and just shy of 204 meters, the Mode Gakuen Cocoon Tower in the Nishi-shinjuku quarter of Tokyo is the world's second tallest education building. Some 10,000 students are taught here in three vocational schools. The building's shape and facade are modeled on the idea of a cocoon inside whose protective shell students can develop and hone their skills before later "hatching" – a real education incubator.

The limited size of the plot necessitated the development of a vertically concentrated educational building – a new typology. Spacious atriums extending over three floors, and which were inserted between the classrooms, offer sweeping views out across the surrounding cityscape and also transpose the schoolyard into a vertical structure. Two large auditoriums with seating for about 1,000 in an adjoining flat building are used both for teaching but also for public events.

The building's overarching superstructure consists of three diagrid supports forming triangular structures, an internal load-bearing core, and the roof structure at the top. The cocoon-like appearance of the exterior is reinforced by strip clusters applied to the glass facade. The building's basic elliptical shape permits green open space use in the lower tapering section while the narrow section of the upper floors enables unhindered views of the sky.

The building is sited like a gateway between the lively Shinjuku railway station and the central commercial and administrative district, revitalizing a quarter that is largely defined otherwise by office buildings. Moreover, its eye-catching appearance also ensures it a standing in the Tokyo skyline that extends far beyond the district itself.

Jury-rating (extract):

"As a high-rise and an educational institute in a dense downtown location the Mode Gakuen Cocoon Tower is unique in trying to define a new typology in quite unprecedented terrain. The building sets a new standard by incorporating the field of education into the world of high-rises, hitherto the preserve of offices and residences."

IHA 2010 Background Information

Frankfurt, 30 August 2010



WOHA Architects, Singapore: The Met Bangkok, Thailand

Associated architects: Tandem Architects, Bangkok
Developer: Pebble Bay Thailand Co. Ltd., Singapore
Height: 231 meters
Storeys: 69
Completion: 2009
Use: Apartments

Photo: © Patrick Bingham-Hall

Located in the downtown district of Sathorn in Bangkok, The Met is a high-rise specially designed for the tropics. Some 230 meters tall, its planning caters to the prevailing tropical climate with monsoon winds and high humidity all year round. The shape of the exteriors is characterized by specifically Thai textures and materials.

The residential tower incorporating 370 apartments across 66 storeys develops a site-specific approach to living in the heart of a densely populated metropolis characterized by heavy air pollution and little outdoor space. The arrangement of indoor and outdoor spaces customarily found in temperate climates was reversed: Generous open spaces are not restricted to the balconies but also intersect the building's volume. This makes the entire structure appear strongly perforated and permeable, lends the building a high degree of permeability. All the two- to four-room apartments have a cross ventilation system running north/south. Thanks to the alignment of the units both to the outside and to the interior open spaces, the apartments are lit and ventilated from all sides, ensuring highly sustainable residences that do not need to rely on an air conditioning system.

The facade design, which makes use of large ceramic tiles, textiles and wooden panels, is inspired by Thai temple tiles and the wooden details in traditional Thai houses.

Private living areas are linked with communal areas, which are distributed throughout the entire building. Thanks to such areas such as terraces with barbecues, a library, a spa area or the roof garden, the design allows for an attractive mixture of potential uses.

With its expressive facade The Met stands out starkly in the skyline of Bangkok. Once the greenery of the gardens and the facade are fully grown it will stand as a successful example of a green high-rise in a tropical climate.

Jury-rating (extract):

“The Met is decidedly programmatic in terms of its functionality. It hinges on the idea of opening up a high-rise, enabling it to quite literally ‘breath’ within a mega-city. Turning the traditional high-rise inside out and placing the outside spaces on the inside, it enables a very pleasant tropical living in a very economic structure that points the way forward for architects to look for innovative local responses to what a high-rise must deliver.”

IHA 2010 Background Information

Frankfurt, 30 August 2010



Kohn Pedersen Fox Associates, New York: Shanghai World Financial Center Shanghai, China

Developer: Mori Building Company, Tokyo

Height: 492 meters

Storeys: 101

Completion: 2008

Use: Offices, hotel, retail

Photo: © Shinkenchiku

A full 492 meters high, the Shanghai World Financial Center is currently the tallest building in China and the third highest in the world. Located in the new Pudong district, the tower is based on the shape of an optical square – a symbol that represents the earth according to Chinese tradition. This geometric shape is penetrated by two vertical arches that represent the sky. The result is a strikingly simple yet elegant building, whose shape seems to alter depending on the observer's standpoint.

On the ground floor a monumental wall of Jura limestone structures the various entrance zones for office spaces, a hotel and the public access to the viewing deck. Located on the 100th floor, 474 meters up, the viewing platform is currently the highest of its kind worldwide and offers visitors a unique view out across the constantly evolving metropolis.

The foundations were laid back in 1995, but the high-rise project was then discontinued owing to the Asian financial crisis. When construction was resumed in 1999, the building designed was adapted to make it 31 meters higher, with additional storeys added, while the existing foundations were left unchanged. This meant the high-rise had to be lighter and withstand higher wind loads. Structural engineers developed a new support system, which not only reduces the weight of the building by ten percent but also makes additional material and cost savings, bringing completion time forward. Four huge supports but also huge diagonals, steel supports and triangulated girders were arranged around the support core and distribute the loads so that the building can both withstand wind and earthquakes.

With its precise and elegant appearance the building has become an eye-catching landmark in Shanghai's skyline and stands for the contemporary identity of the metropolis Shanghai.

Jury-rating (extract):

“The Shanghai World Financial Center stands out not only on account of its sheer height and the huge proportions of the floor plates, but also as its shape changes depending on the angle from which it is viewed, fitting well into the Shanghai Metropolitan Master Plan and championing a very simply elegance.”