Architecture in China has evolved from the search for symbolism to the search for value.

In China, the sky is the limit.

‘Tall Buildings define the culture, aspirations and future of a place, and there is no better example of this than China.’

China is the absolute epicentre of tall building construction globally.

In front of tall buildings, human beings often find themselves great, also negligible.

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The architectural lexicon of tall building design and practice is an emerging field of study which is quickly gaining traction in the Western world. Good tall architecture is not just a matter of vertical reach and height; it is about more than just the visual, it is about the narrative of the project.

This book highlights projects that are paradigmatic of good tall architecture, providing practical strategies towards the design of high-rise buildings, and offering a visual journey through the world of tall architecture.

Great Wall Style - tells the compelling story of grassroots rural enterprise in four small villages alongside the Great Wall of China. Its narrative illuminates the personal story and signiﬁcance, accompanied by stunning images, detailed drawings, and plans.

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APPENDIX

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As recently as a decade ago, an entire book on the tall buildings of China would hardly have been feasible, let alone very long. But, today, China is the absolute epicentre of tall-building construction globally. Many of the iconic towers now rising in China have lent world recognition to cities that relatively few Chinese – let alone Westerners – were previously aware of. The changes wrought by urbanisation, and the scale and ambition of the nation’s vertical iconography, are stunning.

All around the country, both the design and technologies of the typology are being advanced. Tall buildings that gather renewable energy, like the remarkable Pearl River Tower in Guangzhou. Buildings that link themselves together through skybridges, like the Linked Hybrid building in Beijing. Buildings that employ significant double-skin façades and other ventilation strategies, like the Kingtown International Center (KIC) in Nanjing. Or those that take on anthropomorphic or zoomorphic shapes in the quest to provide a different expression, like the Wangjing SOHO in Beijing. At the same time, this concentration of population in vertically extrapolating urban centres is providing opportunities for a more sustainable pattern of life, through consolidating infrastructure and allowing greater sharing of resources, without consuming essential natural, agricultural and recreational land.

China is replete with good high-rise examples. The three iconic buildings that make up Shanghai’s supertall trio are already well known, but the design of each points to potentially different avenues for the typology. The Jin Mao Tower, completed in 1999, is a rebuke of the idea that skyscrapers automatically have a homogenising cultural effect on cityscapes. Here, in its distinctive stepped profile, we recognise allusions to the pagodas of traditional Chinese architecture. Yet the story doesn’t end at the door: The Jin Mao has one of the most spectacular and surprising interior spaces in any tall building. A 30-storey circular atrium with balconies leading to hotel rooms would be spectacular enough; the fact that it begins on the 55th floor and continues to the 88th is staggering.

Directly across the street, the Shanghai World Financial Center’s expressive focus is on its upper void-crowning skybridge, and it is a fantastic experience to walk that space internally, with its vertigo-inducing side glimpses to street level through glass flooring. However, like so many new high-rises in China, the mix of uses in the building – office, hotel, retail, leisure and observation deck – is no less adventurous, as was the design intent of relating to Chinese culture in a more abstract way, in contrast to the more literal approach of the Jin Mao.
Meanwhile, the third ‘neighbour’ in the trio, the Shanghai Tower, is remarkable not only for its 632-metre (2,073-foot) height (upon completion, this will make it the second-tallest building in the world), but for its extensive use of communal sky gardens and double-skin façades to moderate the psychological isolation that can come from spending all day in a tall building far above the ground. Its necessary outriggers, mechanical floors and elevator transfer lobbies are turned into signature design assets — soaring social spaces with 14-storey ceilings, large plantings and curving glass, turning over received notions about what it means to be ‘grounded’ or ‘in the clouds’.

If there is any caveat to this fantastical depiction it is that these myriad positive examples reveal just how much mediocrity often surrounds them. The sheer speed and scale at which construction is being undertaken has also delivered numerous alienating, pedestrian-unfriendly, environmentally unsound cityscapes that contrast harshly with the wonderful, catalytic projects such as those found in this book. It is thus not surprising that tall buildings are not universally celebrated in China, and this book thus serves also as a crucible for cautionary reflection. There is an increasing recognition among leading practitioners that tall buildings must contribute something beyond sheer height and maximisation of land value in order to continue to be viable instruments of urban life.

There is, however, clearly a great potential for tall buildings to become an integrated part of the solution towards more sustainable cities, and our continued existence on this planet. As this book demonstrates, there is no greater laboratory than China in which to urgently test this potential.

Dr. Antony Wood RIBA PhD
Executive Director, Council on Tall Buildings and Urban Habitat (CTBUH)
Research Professor of Tall Buildings, Illinois Institute of Technology, Chicago
Visiting Professor of Tall Buildings, Tongji University, Shanghai
For many people in the Western hemisphere the first buildings that come to mind that epitomise tall buildings are generally the Chrysler Building and the Empire State Building, both located in New York City and both completed in the early 1930s. It’s difficult to determine if these projects had an impact on what was going on in China in terms of architecture and urbanism, but we note that the first major early series of tall buildings appeared in China soon after these American buildings, in the mid-1930s, though on a quite lower scale than that of the projects mentioned here. Considering the low-rise urban landscape of the time, the New York City projects’ impact on the Chinese urban environment may have been more significant than what we might imagine today.

While Shanghai would witness the construction of the famous New York City skyscrapers in the early 1930s, by 1929 there was already a 77-metre-tall (253-foot) building in Shanghai, the Peace Hotel (originally known as the Cathay Hotel and now called the Fairmont Peace Hotel) comprising only 13 levels. The architect of the Peace Hotel was Hong Kong-based Palmer and Turner (a firm known today as P&T Group) who was the architect of a series of early tall buildings in China. The hotel then formed only a part of Sasoon House, which also contained offices and shopping arcades.

In 1934 the Commercial Bank of China office building (designed by Davies, Brooke & Gran) comprised 20 storeys, but then in the same year Shanghai saw the 83.8-metre-tall (275-foot), 21-storey Park Hotel on Nanjing Road (designed by Hungarian architect László Hudec), making it the then-tallest building in Asia. The Park Hotel that now faces Shanghai’s People’s Square was originally erected as the Joint Savings Society Building, as explained by Edward Denison and Guang Yu Ren in Building Shanghai, and from the detailed project description we learn that the building was considered an early vertical mixed-use building as it used to comprise a banking hall, bank offices, the Park Hotel, private apartments and an octagonal observation deck at the top. Soon after, a series of buildings, including the Bank of China (1939; designed by Luke Him Sau and Palmer and Turner), helped define Shanghai’s skyline along the Bund. It’s this preserved waterfront skyline that can be observed from the new supertall business district that was created in the 1990s on the other side of the Huangpu River in what is known as Pudong (part of the 1992 Master Plan of Pudong New Area), an area that today accommodates the tallest buildings in the city.

Introduction
Georges Binder

1 Peace Hotel (left), Shanghai, 13 storeys, 1929 • Architect: Palmer and Turner • Photography: courtesy P&T Group
2 Park Hotel, Shanghai, 21 storeys, 83.8 metres (275 feet), 1934 • Architect: László Hudec • Photography: old postcard, coll. G. Binder • Tallest building in Asia at the time of its completion, the Park Hotel was originally erected in 1934 as the Joint Savings Society Building and can be considered as an early vertical mixed-use building.
3 Hongkong & Shanghai Banking Corporation, 13 storeys, 1935 (now demolished) and Bank of China, 17 storeys, 1950, Hong Kong • Architect: Palmer and Turner • Tallest building in Hong Kong upon completion in 1935, the Hongkong & Shanghai Banking Corporation was the first fully air-conditioned building in the city, while the Bank of China Building remained the city’s tallest building from 1950 till 1963.
4 Mandarin Hotel (now Mandarin Oriental Hong Kong), Hong Kong, 26 storeys, 86.68 metres (284 feet), 1963 • Architect: Leigh & Orange • Photography: courtesy Hongkong Land Limited
Hong Kong

Meanwhile in Hong Kong, the tallest buildings are being built by some of the same names seen in Shanghai. The Hongkong & Shanghai Banking Corporation (1935; now demolished) and the Bank of China (1950) buildings, both designed by Palmer and Turner, would lead the way in the central district’s skyline for almost two decades. While mainland China will see almost no tall buildings erected from the late 1930s till the early 1980s, Hong Kong continued to erect its now-famous skyline. 1963 is perhaps a pivotal year as it is the year of the opening of both the Mandarin Hotel (now known as the Mandarin Oriental Hong Kong) and the Hongkong Hilton — both hotels being 26 storeys high — they probably became the tallest buildings in the city for a short period at 86.68 metres (284 feet) and 89.4 metres (293 feet), respectively. If the Mandarin designed by Leigh & Orange could perhaps be considered the link between the earlier Art Deco buildings and the later Hong Kong contemporary buildings as we know them now; the Hilton designed by Palmer and Turner probably brought to Hong Kong (and China in general) its first major International Style building on a large scale, with a local flavour considering its lace-like podium façade. Palmer and Turner again put its mark on the Hong Kong skyline during the next two decades with other projects growing ever taller. When the Connaught Centre (now known as Jardine House) was completed in 1973 it became an instant city landmark — surmounted by a half-trunked pyramid-shaped rooftop and with its unexpected round windows. At 52 storeys and 178.5 metres (584 feet) high, the waterfront Connaught Centre project in central Hong Kong then became the tallest building in all of Asia, allowing the continent to be mentioned whenever tall buildings from around the world were being discussed or published. Interestingly, 1973 also saw the completion of the 56-storey Tour Maine-Montparnasse in Paris, then the tallest in Western Europe, as well as the completion of the 110-storey World Trade Center in New York City, which then became the world’s newest tallest building.

In the next decade Palmer and Turner; by then known by the name still used today, P&T Group, placed its mark on Exchange Square, a 52-storey twin tower building completed in 1985 and complemented in 1988 by a third tower. Exchange Square featured an array of indoor and outdoor public areas, a welcome amenity in the Central district of Hong Kong. Apart from its prominence on the city skyline next to the Connaught Centre, Exchange Square became well known internationally in real estate circles in such a way as to bring the fame of the project far beyond Hong Kong, Chinese or even Asian boundaries. If we are to single out an architectural firm that made its mark for several decades in the area, such as Palmer and Turner (P&T Group), then we should also note that Jardine House (1948), the Mandarin Hotel (1963), Connaught Centre (1973) and Exchange Square (1985) have all been completed by the same developer, Hongkong Land, a development company that proved to be a major player in creating the current image of Hong Kong. This city is known worldwide for its contemporary tall buildings, many of which are located centrally and are connected by elevated pedestrian bridges that are protected from both vehicle traffic and inclement weather; and shops in the lower levels of many buildings create a contiguous but varied and lively urban fabric. In 1965, upon completion of the Prince’s Building, Hongkong Land added the first enclosed air-conditioned footbridge known as the Chater Road pedestrian bridge in Hong Kong to create a connection with the Mandarin Hotel that had been completed a couple of years earlier. This footbridge linked the hotel’s retail area with the Prince’s Building shopping arcade. From this single bridge the network of interconnected tall
A square prism — the symbol used by the ancient Chinese to represent the earth — is intersected by two cosmic arcs (representing the heavens) as the tower ascends in gesture to the sky. The interaction between these two realms gives rise to the building’s form, carving a square sky portal at the top of the tower that lends balance to the structure and links the two opposing elements — the heavens and the earth.

Soaring 101 storeys above the city skyline, the Shanghai World Financial Center stands as a symbol of commerce and culture that speaks to the city’s emergence as a global capital. A virtual city within a city, the SWFC houses a mix of office and retail uses, as well as a Park Hyatt on the 79th to 93rd floors. Occupying the tower’s uppermost floors, the SWFC Sky Arena offers visitors aerial views of the historic Lujiazui area and winding river below and stunning views of the horizon. The interactive element that lends balance between these two realms gives rise to the building’s form, carving a square sky portal at the top of the tower.

Originally conceived in 1993, the project was put on hold during the Asian financial crisis of the late 1990s, and was later redesigned to its current height — 32 metres (105 feet) higher than previous. The new, taller structure would not only have to be made lighter, but would need to resist higher wind loads and utilise existing foundations that had been constructed prior to the project delay. The innovative structural solution was to abandon the original concrete frame structure in favour of a diagonal-braced frame that had been constructed prior to the project delay. The innovative structural solution was to abandon the original concrete frame structure in favour of a diagonal-braced frame with outrigger trusses coupled to the columns of the megastructure. This enabled the weight of the building to be reduced by more than 10 percent, consequently reducing the use of materials and resulting in a more transparent structure in visual and conceptual harmony with the tower’s elegant form.

Photography: 1 ©H.G. Esch; 2 ©Tim Griffith

### Shanghai World Financial Center

**Location** Shanghai  
**Completion** 2008  
**Client** Mori Building Co., Ltd  
**Architect** Kohn Pedersen Fox Associates (design)  
• Mori Building Architects and Engineers (project)  
**Associate architect** Irie Miyake Architects  
**Architect of record** East China Architectural Design & Research Institute (ECADI)  
**Structural engineer** Leslie E. Robertson Associates  
**MEP engineer** Kenchiku Setsubu Sekkei Kenkyujo  
**Project management consultant** Mori Building (developer)  
**Other consultants**  
• NECOM • Hitachi Ltd • ThyssenKrupp • ALT Cladding (façade)  
• Rolf Jensen & Associates (fire)  
**Main contractor** China State Construction Engineering Corporation • Shanghai Construction Group  
**Uses** Office, hotel, retail, gallery & observation deck

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<th>Number of buildings</th>
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</thead>
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<tr>
<td>Height (m (ft))</td>
<td>492 (1,614)</td>
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<tr>
<td>Above-ground storeys</td>
<td>101</td>
</tr>
<tr>
<td>Basements</td>
<td>3</td>
</tr>
<tr>
<td>Site area (m² (ft²))</td>
<td>382,000 (4,111,814)</td>
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<tr>
<td>Gross above-ground area (m² (ft²))</td>
<td>381,600 (4,107,508)</td>
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<tr>
<td>Total number of elevators</td>
<td>91</td>
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<tr>
<td>Speed of fastest elevators (m (ft/s))</td>
<td>10 (33)</td>
</tr>
<tr>
<td>Elevator brands</td>
<td>Otis Elevator Company • Toshiba Elevator and Building Systems Corporation (TELC)</td>
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<tr>
<td>Number of car parking spaces</td>
<td>1,100</td>
</tr>
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<td>Hotel brand</td>
<td>Park Hyatt</td>
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</table>

### Principal structure materials

Composite
Shanghai Tower will be a supertall tower sited in the heart of Shanghai’s Lujiazui Finance and Trade Zone, adjacent to the Jin Mao Tower and Shanghai World Financial Center. Shanghai Tower’s distinctive transparent spiral form will showcase cutting-edge sustainable strategies and public spaces that wrap its perimeter from crown to base.

The tower has a rounded triangular footprint derived both from the bend in the nearby Huangpu River and from its relationship to the two adjacent towers. Shanghai Tower’s footprint was reduced to make more room for green spaces, pedestrian paths, and entryways to the tower, creating a public space for respite and social interaction.

Shanghai Tower is organised internally as a series of nine cylindrical buildings stacked one atop the other, with nine atria encircling them. The twisting, asymmetrical shape of the tower reduces wind loads on the building by 24 percent, reducing the structural load on the building. At the time of printing, the tower’s pinnacle featured the world’s highest non-enclosed observation deck.

The innovative design incorporates two independent curtain walls – the outer skin is cam-shaped in plan, the inner one is circular. The space between them forms the atria that will house landscaped public gardens at regular intervals throughout the building. These sky gardens line the building’s perimeter, and both interior and exterior skins are transparent, establishing visual connections between the tower’s interiors and Shanghai’s urban fabric. At night the building’s glowing translucent form further joins city and tower.

The retail podium is a multistory retail experience that incorporates an ambitious mix of premium luxury brand flagships, one-of-a-kind specialty retailers and high-concept dining. Acting as a weather barrier, the curved podium façade is glazed to merge inside with outside, allowing daylight to penetrate the space.
Located in the centre of Shenzhen, the Ping An Financial Centre (PAFC) is a ‘transit-integrated, tall building’, occupying a major node in the increasingly connected megalopolis of Hong Kong/Shenzhen/Guangzhou. PAFC will be 660 metres (2,165 ft) tall, comprising around 460,000 square metres (4,951,399 square feet) of floor area across 115 levels, with a daytime population of 17,000. And yet, despite its size, it will also have significant sustainability credentials.

As a design, ‘Ping An’ is the combination of the Chinese characters for ‘peaceful’ and ‘safety’, evoking the entrepreneurial spirit of Shenzhen. Architecturally, the exposed columns provided the opportunity to articulate structural elements on the façade. Linen-finish stainless steel was selected for the column finish to enhance the ductility of the overall form. Eight stainless-steel columns trace the edges of the tower and converge into the spire in one continuous gesture. Each column is clasped by a stone buttress, stylised like the talons of some great bird gripping the earth before taking flight. Vertical strands of stainless steel are drawn tightly along the full height of the tower to express the underlying tension.

Its stretched, needle-like shape is streamlined and notched with continuously tapering corners, for both aerodynamic performance and visual effect, as well as for returning the maximum possible number of square, functional floor plates on a compact site. Overall, the shape of the tower achieves a 32 percent reduction in overturning moment and a 35 percent reduction in wind load compared to China code. With an extremely dense program, well-chosen materials and mechanical engineering strategies are predicted to sustain an 18.25 percent energy savings beyond ASHRAE standards, and a 46 percent annual savings in energy costs over a conventionally constructed commercial office building of the same scale.

High performance is factored into the building, from the structural health-monitoring system to its synchronised movement of its independent elevator cars, and the optimisation of cleaner, cooler air at the pinnacle for use through sophisticated use of Building Information Modelling (BIM).

**Ping An Financial Centre**

- **Location**: Shenzhen
- **Completion**: 2016
- **Client**: Ping An Life Insurance Company of China
- **Architect**: Kohn Pedersen Fox Associates
- **Architect of record**: CCDI
- **Structural engineer**: Thornton Tomasetti
- **MEP engineer**: J. Roger Preston Group
- **Cost consultant**: Rider Levett Bucknall
- **Other consultants**: ALT Cladding (façade) • MVA Transportation, Planning & Management Consultants (traffic) • LPC (lighting) • Arup (sustainability & fire) • RWDI (wind)
- **Main contractor**: China Construction First Group Construction & Development Co., Ltd
- **Uses**: Office, retail
- **Number of buildings**: 1
- **Height**: 660 m (2,165 ft)
- **Above-ground storeys**: 115
- **Basements**: 5
- **Site area**: 18,931 m² (203,772 ft²)
- **Total gross area**: 459,525 m² (4,153,987 ft²)
- **Total number of elevators**: 80
- **Speed of fastest elevators**: 10 m (33 ft)/s
- **Number of car parking spaces**: 1,174
- **Principal structure materials**: Composite

Source: Kohn Pedersen Fox Associates
Architecture in China has evolved from the search for symbolism to the search for value.

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Tall Buildings define the culture, aspirations and future of a place, and there is no better example of this than China.

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In front of tall buildings, human beings often find themselves great, also negligible.

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Jamee Geensawat, Graham Perkins

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Phoebe Morgan RSA Architects