BUILDING TALL (AND DESIGNING DEEP) IN CHINA

Thomas Kerwin of SOM considers the experience of Western firms working in China and looks at how its buoyant economy has acted as test bed for new forms of architecture, especially urban super-towers.

In 2006, one of China's most talked-about television advertisements featured a famous ancient pagoda morphing into the 421m tall Jin Mao Tower in Shanghai's Pudong District. The ad resonated throughout China because Jin Mao was then the country's tallest building. Even more to the point, the ad struck home because of the tower's culturally conscious, feng shui-elaborated iconography.

It was not coincidental that Shanghai's first super-tall building was 88 storeys high, featured an octagonal floor plan, and was completed on 28/8/98, the number eight being particularly propitious in Chinese tradition. Like Jin Mao, virtually all the first wave of high-rise designs in Shanghai and Beijing utilised deeply ingrained Chinese architectural forms. This influence was particularly visible in the crowns and cutouts of these buildings. Early Chinese-style Shanghai designs included King Tower (1996), Bao'an Tower (1997), the International Ocean Shipping Building (2000), while early Beijing towers included the Capital Mansion (1989), the Jing Guang Centre (1990) and the Construction Bank of China Headquarters (1999).

In the last decade, there has been a move away from the literal and historical. Tower design has headed instead towards a more structurally integrated and sustainable approach. Looking, for instance, at the Lujiazui Financial and Trade District in Pudong, this evolution is easily discerned by comparing Jin Mao with the 492m Shanghai World Financial Center (Kohn Pedersen Fox, 2009), and then comparing both with preliminary plans for the nearby 'Z-3' site. Each successive building is taller, more advanced in terms of structural and energy-saving innovations, and each owes increasingly less to historic tradition for its design themes. Pudong's evolutionary design tableau is beginning to be repeated in cities throughout China.

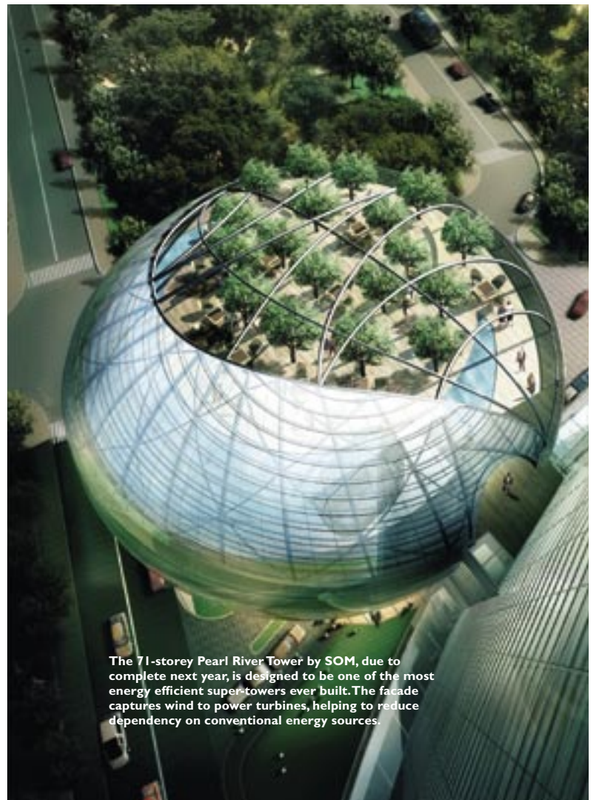
It is possible that China will assume the mantle of world architectural leadership within the next few decades. Whether or not this happens, historians studying China's design explosion of the late '90s and early Noughties will recognise that something extraordinary was taking place architecturally. The rush of foreign architects into China that began in the early 1990s represents one of history's great flowerings of architectural endeavour. Design firms from Europe, Japan, Australia and America strove to achieve new levels of architectural, engineering, planning and design innovation in China, despite an economic environment that was exceedingly hard to fathom, let alone master.

The underlying statistics of the Chinese development boom are telling. In the late 1990s, over half the world's super-cranes were at work in Shanghai. In 2004, it was reported that China used 55 per cent and 36 per cent respectively of that year's world concrete and steel production. The result is that today, Shanghai has more high-rises over 28 storeys than all the cities on the West Coast of North and South America combined.

Nor, barring economic catastrophe or political upheaval, will this trend slow. With high-rise saturation and higher costs becoming the mean in first-tier cities such as Shanghai, Beijing and Guangzhou, intensive design has begun migrating to the two hundred second- and third-tier Chinese cities with populations over one million. Not surprising, in many of these, the first take on tower development was an interest in the pagoda-towers that constituted initial high-rise development in Shanghai and Beijing. In the face of this urge towards nativism, there have been two competing responses.

The first was to simply go along with the programme and replicate Jin Maos all over the country. The second, more interesting response, was to strive for designs that were unique to that city's setting and building's purpose. The latter was the approach taken by SOM for super-tower designs in Nanjing, Wenzhou, Zhengdong and other cities. As China has opened up to this new generation of building

Building high is not a new phenomenon – the fifteenth-century Porcelain Pagoda in Nanjing towered over its surroundings. Courtesy RIBA Library Photographs Collection.



The 71-storey Pearl River Tower by SOM, due to complete next year, is designed to be one of the most energy efficient super-towers ever built. The facade captures wind to power turbines, helping to reduce dependency on conventional energy sources.

SOM's proposed White Magnolia Plaza in Shanghai, with Pudong – the city's rapidly growing business district – and the Jin Mao Tower across the river.

design, it has also recognised the need to integrate advanced structural and engineering innovation. In projects such as SOM's Z-3 diagrid structure; in the atrium of the New Beijing Poly Plaza, enclosed by the world's largest cable-net-supported glass wall; in the external lateral bracing wrapping Nanjing's Jinao Tower, and many other structural innovations, China is increasingly seen as a pioneer integrator of architecture and advanced engineering. This relationship has proven to be an important selling point with China's increasingly sophisticated design bureaus whose staffs now celebrate the notion that new architectural ideas are not simply about image, but increasingly about deep structure as well.

The great leap forward

Another important aspect of China's architectural great leap forward is the requirement that designers integrate urban planning and landscape components into virtually all architectural design. Rather than simply dropping a tower onto a site, Chinese design agencies increasingly demand that architects integrate those sites into the fabric of existing communities, and do it in ways that enhance urban livability. Leading planning groups that have undertaken important planning projects include EDAW's conceptual planning for Jiujiang City in Jiangxi Province and Sasaki's masterplan for the 2008 Beijing Summer Olympics site. The latter focuses not only on the games, but also on post-Olympic utilisation of the site. SOM planners are also playing an important role, responsible for redeveloping Shanghai's Huangpu riverfront as well as the masterplan to transform Shanghai's Chongming Island into a compact, transit-friendly, sustainable urban development able to coexist with near-to-urban agriculture.

A critical and often overlooked aspect of creating a successful design practice in China involves integrating business processes capable of profitably managing project design and delivery. Doing business in China is never simple or straightforward, and requires nimble project management able to navigate what almost always begins with tough negotiations and often gets more difficult from there. One successful approach begins by pairing design and project management professionals who can collectively test, challenge, and refine projects in terms of both design and economics. Ultimately, great design cannot be achieved without strong management able to create a good match between client and design firm, as well as assure a solid and agreed-upon framework, scope and project programme.

Another key to successfully solving the Chinese design-business puzzle revolves around the 'number of boots' on the ground. For generations there has been a debate among architects about the relative efficacy of headquarters versus satellite offices. It is enough to say that in China, all things personal and business-related ultimately devolve to relationship building. There is, in other words, no substitute for being there.

One early and important step that helped smooth the way for Western architects moving into China, began in the early 1970s when leading firms began opening offices in Hong Kong. With what was then still called 'Mainland China' in the throes of the Cultural Revolution, the British-ruled, Chinese-economically driven Hong Kong proved to be an exceptional halfway house in which to practise the kind of design work that would ultimately define China's urban skylines.

In the late '80s and early '90s many of these firms began making their move to Shanghai and Beijing. Initially there were two ways to do design business in China; to operate as a joint venture with a Chinese design firm, or register a branch office with the Ministry of Construction on an individual project basis. The first limited the foreign firm to conceptual design work, while the second requires a succession of project approvals. In either case, the bottom line was to create design studios in China with a mix of foreign and local staffers.

Critical collaborations

This blending was key to the development over time of critical collaborative relationships. Working closely with local architects and government design bureaus often meant that iconic big ideas would not be short-circuited by misunderstandings over niggling design codes or other mandated requirements. Understanding that all design in China is ultimately local, highlighted the necessity to work closely not only with those local design bureaus, but also with 'National Treasures', the revered elders who were part of the officially sanctioned review process, and often the ultimate judges of a project's suitability. In dealing with these National Treasures, as well as with other government design entities, it proved crucial to take a long-term approach. While this might lead to short-term setbacks, it could also enable great ideas and grounded relationships to be banked for future use. A similar approach to cracking the Chinese design codes involves a willingness to take educated gambles on project designs rather than follow the path of least resistance. A line about energy conservation in a design brief for a corporate headquarters in Guangzhou, for example, led to the formulation of one of the first 'net-zero-energy' designs. Thirty-two distinct sustainable strategies transformed the Pearl River Tower programme into a building that, when completed in 2009, will be the world's most energy-efficient super-tower, able to tap into sun, wind, cool water aquifers and other available natural energy streams. Beyond breakthrough engineering, the Pearl River design is singular in its brief to use every curve, every turn and every angle to enhance the pressure differential from front to back to drive the building's integral wind turbines.

The Pearl River Tower may well be the prototype of the next generation of Chinese super-tower, but it will be a design that begins in China, and radiates outward to the rest of the energy-hungry world. It also exemplifies the kind of advanced design that today is virtually unbuildable in the West because of prohibitive material costs, innovation-crushing labour contracts and a general slowness to adapt new ideas. It is just the opposite of China's new design consciousness, which is at its heart less code-based and more performance oriented.

To those who wonder if the ongoing ascent of indigenous talent will mean an end to the need for Western architects in China, the nation's willingness to serve as a world-first design test-bed should reassure. It is almost certain that great, innovative and breakthrough design ideas and ideals will continue to find an honoured home in an architecturally forward-thinking China. THOMAS KERWIN

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