

BETWEEN HEAVEN AND EARTH

|
Words Herbert Wright

For skyscraper experts worldwide, the annual Council of Tall Buildings and Urban Habitats conference is the highlight of the calendar. We report from its 2013 London event and talk to BROAD Group chairman Zhang Yue about Sky City – an astounding proposal for a vertical city for 30,000 people, that would be the tallest tower in the world



In 1956 Frank Lloyd Wright revealed a vision of a Mile-High Tower (aka Illinois Sky City) – a vertical city for 100,000 souls in 528 storeys. At the London conference of the Council of Tall Buildings and Urban Habitat (CTBUH), two announcements brought that vision tangibly closer. Finnish lift manufacturer Kone announced its carbon-fibre-based UltraRope that doubles the range of a lift – currently limited to 500m with heavier, conventional steel ropes. Secondly, the chairman of China’s Broad Group, Zhang Yue, presented Sky City, an extraordinary utopian vertical town 828m high (see page 147). The announcements loomed high above the conference’s topical theme: Height and Heritage.

The CTBUH is a Chicago-based organisation that has become the authority, forum and clearing house for information about skyscrapers. Its conference attracts architects, structural engineers, developers and others. At the conference’s opening, its executive director Antony Wood warned that ‘this is not a fashion show’. That didn’t stop buildings being paraded, starting with London’s new icons. Developer Irvine Sellar presented The Shard, including that Renzo Piano designed the bus station beneath it: ‘I gotta tell you, he doesn’t design many bus stations,’ he offered. Architect Rafael Viñoly talked about the Walkie-Talkie at 20 Fenchurch Street (‘I know the building looks today a bit isolated’), while the Leadenhall Building (Blueprint 325, April 2013), which was topped off just a week after the conference, had its own whole suite and programme of talks. Later, London would win CTBUH awards for Piano’s Shard (Blueprint 315, June 2012) as Best Tall Building (Europe) and Foster’s Gherkin in the new category 10 Years’ Best. (The latter’s Calgary tower, The Bow, was voted the Americas’ Best).

Graham Stirk of RSHP offered a warning about the local high-rise boom and the arrival of viewing platforms and skygardens above the capital: ‘If we’re not careful, London becomes a series of funfair experiences where only those who have the money can have a ride.’ He continued: ‘We have two responsibilities as architects – to the client and to society at large’. That raises huge issues, but the discussion’s context was just one of them, the public realm. Lead designer of the Leadenhall Building, Stirk said the only place to offer the public was under it, resulting in its vast galleria. Terry Farrell, long

a proponent of ‘place-making’, declared: ‘A big tree affects all around it; a high-rise building changes the whole ecology around it’. He proposed a ‘programme of review of several streets’ around any new tower (more from Farrell in 20/20, page 180).

Worldwide, considerations like public realm are often absent. Jasleen Changani, CTBUH delegate and proprietor of residential architects Studio C, based in Mumbai and designer of towers such as that city’s Aalya apartments, lamented that ‘most future developments are entirely a profit-making process with no contribution to the city’s social fabric’.

Residential developers see lucrative returns from high-rise, nowhere more so than with the global demand for London property. Harry Handelsman, CEO of Manhattan Lofts, presented the SOM-designed Stratford Manhattan Loft Gardens, a spectacular 42-storey tower for Stratford with skygardens, which are fast becoming de rigueur. Squire and Partner’s City Pride tower, which had not been cleared for announcement in time for CTBUH, will have the highest skygarden in London at 239m. It is one of three residential towers around Canary Wharf set to rise more than 200m high. Today’s residential skygardens are descended from Le Corbusier’s communal rooftop on Unité d’Habitation (1952), which included a children’s art school, paddling pool and the aspiration of social inclusion.

Düsseldorf-based architect Christoph Ingenhoven may have presented the most unusual skygarden in his practice’s design Marina One in Singapore, which will complete in 2016. He described it as ‘an oasis in the middle of four skyscrapers’, and along with gardens at numerous other levels, they replace the calculated biomass the site would have had as jungle. Another refreshing project shown was the AHMM-designed Villagio II, which may be modest in height but is the tallest building in Accra, Ghana. Traditional local Kente weave informs facades, and there’s a communal swimming pool on the roof.

What of the heritage issue? European cities agonise over the impact of skyscrapers on historic cityscapes. Paris particularly is torn about allowing skyscrapers in the city proper, where Haussmann-set 19th-century height limits have since been adjusted to 37m. UNESCO has threatened to remove World Heritage Status from historic sites in Liverpool, Cologne, Prague, Seville and Westminster because of planned skyscrapers sully

views of them, but all this received scant attention. About the only significant discussion was London’s protected viewing corridors of St Paul’s and Westminster. Terry Farrell declared that ‘we’ve Haussmannised the sky. To preserve all views is a lost cause’. Nevertheless, when RIBA president Angela Brady, chairing the discussion, asked for a show of hands on whether the corridors should be scrapped, the room was almost unanimously in favour of keeping them.

London clearly dominated the conference because it has lots of skyscrapers, heritage and not least architects and developers. It was down to architect Ian Simpson, designer of Manchester’s Beetham Tower and Birmingham’s Holloway Circus Tower, to spell out that when it comes to high-rise, ‘a chasm divides London and the regional cities’. His presentation highlighted how it costs twice as much to build in London and the time from commission to completion can be 10 times more, but the resulting value in London is also 10 times more. Later he told Blueprint: ‘I don’t believe any tall buildings will be built in the regional cities for at least two to three years. It is due to the depressed economy, and... that there is no value in residential accommodation at the moment.’ Luckily for Simpson he has London projects, including One Blackfriars (some already call it ‘the Boomerang’), a mainly residential, 170m-high, 50-storey tower enclosed in a sculptural outer glass skin.

Big Glass remains the fashionable facade treatment for big buildings, especially statement towers. An evangelist for the ‘smart combination’ of low-tech design, with high-tech elements, German architect Werner Sobek even revealed a glass tower for Ekaterinaburg, Siberia. There ‘people are reaching at a bit of sun, so we have full glazing,’ he explained. But dissent against glass is growing. Make’s Ken Shuttleworth has long been vocal. He reiterated his message at the closing presentations: ‘There’s been an orgy of glass. It’s all out of date!’ Nevertheless, he graciously labelled The Shard ‘a fabulous building’ and called for viewlines of the Gherkin (which he worked on under Foster) to be protected.

Big Glass and sculptural forms may still be on the march in London, but as Shuttleworth pointed out, they characterise buildings designed before the 2008 economic crash delivered ‘the death of bling’. He reports that with the 54-storey Morello

Tower, starting construction next year in Croydon, ‘we concentrated on materials, not shape’. Later, chatting with Blueprint, Antony Wood was even more vocal about glass: ‘It should have been over 20 years ago. What’s ridiculous is that we’re doing gymnastics – vented facades, low-E glass technologies et cetera – to cover the problems we created in the first place. We need to start building towers out of vegetation!’ That may sound mad, but there are architects working on it.

So, what are the global trends in high-rise? Obviously, skyscrapers are getting taller and mushrooming in numbers – in 2014, there will be more than 900 towers over 200m high, an increase of a fifth in just two years, and by 2019 height will have reached 1000m (Jeddah’s Kingdom Tower by Smith+Gill Architecture of Chicago is under construction). Prefabricated modular structures will become the norm, and mixed use will increasingly mean more than just a hotel on the upper floors.

A building’s energy performance has long set the sustainability drive, and embedded energy and recyclability are now tickboxes on the checklist. How high-rise plugs into the city, whether socially exclusive or inclusive, and the previously mentioned question of public realm, are now on the agenda. In places such as Hong Kong, skyscrapers have financed stations. That idea may travel, but already rail hubs and high-rise are seen as a natural fit, and even Gulf cities are building metros as skyscrapers proliferate.

Bob Lang of Arup naturally took an engineering perspective. Wind-load has been the critical factor in skyscraper structures, but temperature and seismicity will be more important, he said, because high-rise has shifted to hot, earthquake-prone places. One example he gave was the 50-storey tower by RSHP and Legorreta+Legorreta (the practice founded by the late legendary Ricardo Legorreta) for BBVA Bancomer, being built in seismically active Mexico City. He described its megaframe rising from soft ground as ‘ductile’.

As humanity’s inexorable urbanisation defines this century, high-rise increasingly defines the urban habitat. A global professional high-rise forum is vital, and CTBUH provides it. Next year the conference is in Shanghai, which builds more and taller than London ever can. The conference is set for yet greater heights of its own.

Vertical Europe: Iconography

1 DE ROTTERDAM
Rotterdam
150m, 44 storeys,
OMA, 2013

**2 ONE CANADA
SQUARE**
London
235m, 50 storeys
Cesar Pelli, 1991

3 STRATA
London
148m, 43 storeys
BFLS, 2010

4 TOUR FIRST
Paris
231m, 50 storeys,
Stenzel, Dufau & Dacbert,
1974
remodelled KPF, 2011

**5 COMMERZBANK
TOWER**
Frankfurt
259m, 56 storeys
Foster + Partners, 1997

6 WILLIS BUILDING
London
125m, 26 storeys
Foster + Partners, 2007

**7 MERCURY CITY
TOWER**
Moscow
339m, 70 storeys
Frank Williams, 2013

8 HERON TOWER
London
230m, 46 storeys
KPF, 2011

9 MG TOWER
Ghent
119m, 24 storeys
Jaspers-Eyers, 2012

10 RÔNESANS TOWER
Istanbul
186m, 40 storeys,
FXFOWLE, 2014

11 TURNING TORSO
Malmö
190m, 54 storeys,
Santiago Calatrava, 2001

**12 THE LEADENHALL
BUILDING**
London
225m, 50 storeys
RSHP, 2014

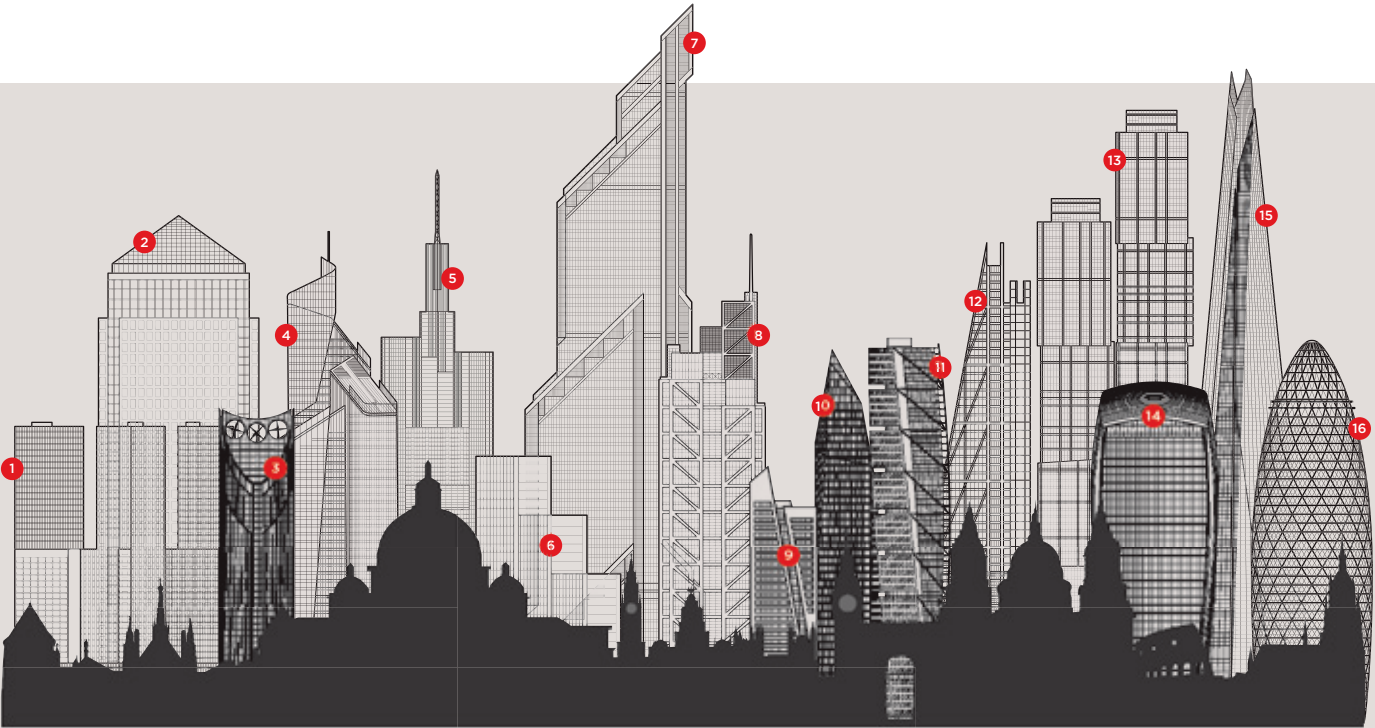
**13 CAPITAL CITY
TOWERS**
Moscow
302m & 257m,
75 & 65 storeys
NBBJ, 2010

14 20 FENCHURCH ST
London
160m, 37 storeys
Rafael ViñolyArchitects,
2014

15 THE SHARD
London
306m, 72 storeys
RBPW, 2012

16 30 ST MARY AXE
London
180m, 40 storeys
Foster + Partners, 2004

1 (PREVIOUS PAGE) IAN SIMPSON THIS ILLUSTRATION CTBUH

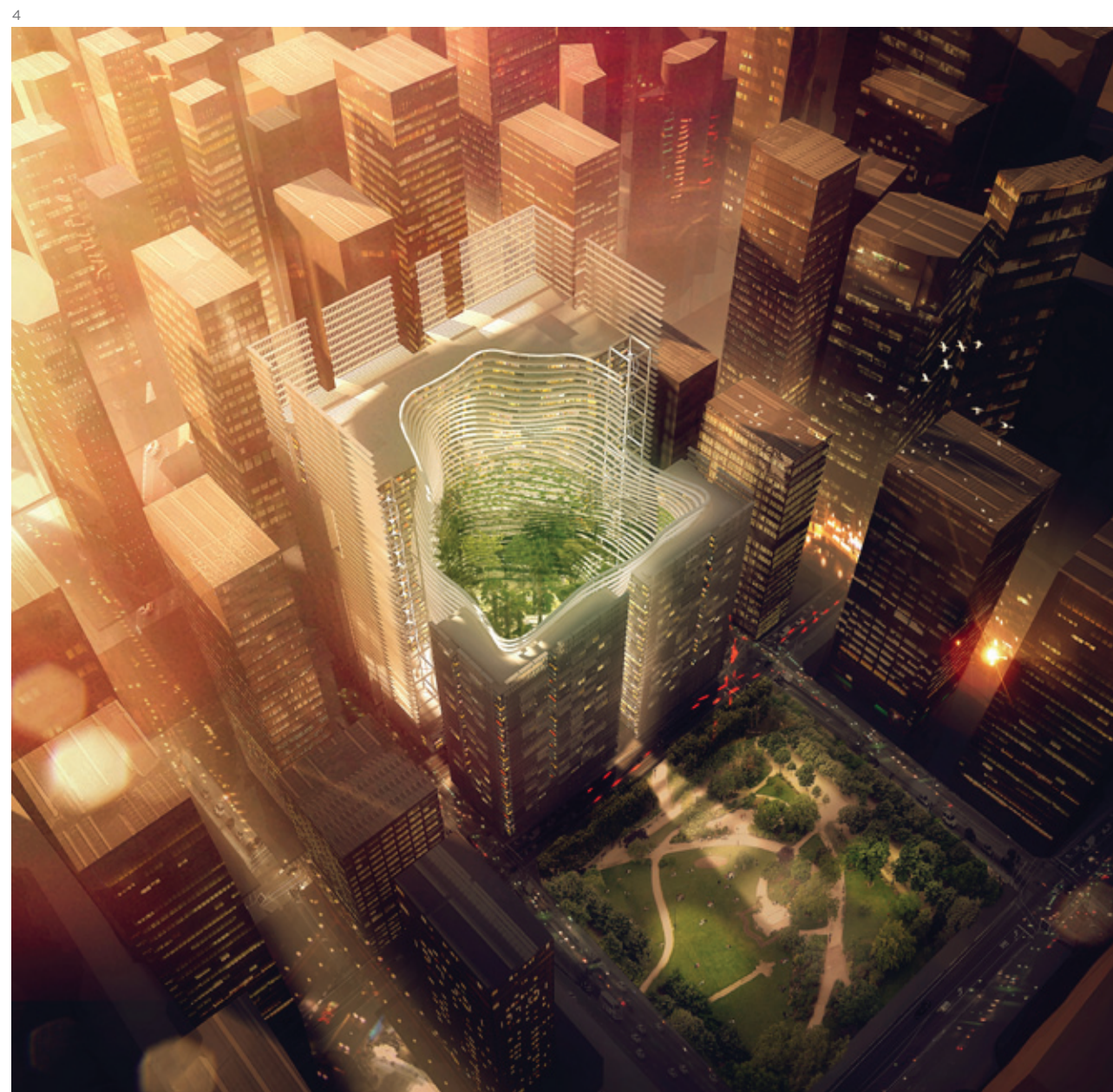




2



3



4

2 - The 50-storey BBVA Bancomer Tower by RSHP and Legorreta in earthquake-prone Mexico City

3 - Mumbai is the location for the 170m-high Aalya tower by Studio C

4 - Marina One in Singapore by Christoph Ingenhoven is termed 'an oasis' amid tower blocks

5 - An aerial view of the Kingdom Tower, Jeddah, which is due to top a height of 1,000m

6 - The 42-storey Manhattan Loft Gardens is underway in Stratford, London

7 - Relatively modest in size, the Villagio by AHMM is nonetheless the tallest building in Accra, Ghana

8 - The Iset Tower by Werner Sobek in Ekaterinburg, Siberia, is due to complete next year

2 RSHP AND LEGORETTA + LEGORETTA 3 STUDIO C MUMBAI 4 INGENHOVEN ARCHITECTS 5 SMITH + GILL 6 SOM AND MANHATTAN LOFT CORPORATION 7 ALLFORD HALL MONAGHAN MORRIS 8 WERNER SOBEK, STUTTGARD

5



7



6



8





CHAIRMAN ZHANG'S
BRAVE NEW WORLD

The urbanisation of China is the single biggest transformation of any society, anywhere, ever. In 1980, a fifth of the population was urban. Now more than half is, and by 2025 another 300 million will migrate to cities. Planners grapple with the issue. Enter Zhang Yue, chairman of China's BROAD Group. His urban proposition is extraordinary: Sky City, a genuinely vertical town on 202 levels in which everything from schools to parks would provide a life for 30,000 souls.

At 838m high, Sky City will exceed the world's tallest skyscraper, Dubai's Burj Khalifa, by 10m. Many have visions, but Zhang personally broke ground at Changsha, Hunan Province, in July. Then work stopped in a dispute about local building permits. Whether this setback is temporary or not is still unclear. Zhang had earlier told Blueprint, 'We're not building one building, we're going to build many of them in the coming days.'

Zhang was in the capital for the CTBUH London conference, staying in a 18th-century, converted brewery. The room's curtains were drawn, and from the shadows falling across the sofa he described his 'three visions' for the million square metre Sky City: 'The first one is to conserve land. The second, to conserve energy. And the third, to allow people who live inside to have a very high quality of life.'

The Burj Khalifa took five years to build, but Sky City's structure should take just seven months. BROAD Group's Broad Sustainable Building (BSB) division has already demonstrated previously unfeasible construction speeds. The 30-storey T30 Hotel at Dongting Lake, in China's Hunan province was built in just 15 days (and people who've stayed like it). Modular

China is changing far quicker than the West did, and it may not take long to see if the more socially mixed Sky City works

construction is the basis of BSB's methods, and Sky City's 3,000-plus construction crew are like industrial assemblers. Zhang says that 'it's 14 hours to build one car. It should be like that'. Ninety per cent of Sky City will be factory made – slightly more than the West's most advanced modular high-rise, The Leadenhall Building (Blueprint 325, April 2013). There, safety put a limit on speed, but Zhang brushes that aside. Although some in the construction industry have questioned BSB's safety record, Zhang says that at T30 there were 'zero injuries', not even 'where someone broke their nail '. In the West '90 per cent of people probably don't know each other when they come together to build a building' and that leads to safety problems, among others, he says.

Sky City is essentially an earthquake-resistant steel cage matrix, served by 92 lifts and triple-glazed. From six storeys of basement, the structure, with a footprint of less than a hectare, rises to a roof at 727m, above which is a 'sky tower' mast. In plan, four symmetric, orthogonal wings contain almost everything, with three setbacks on which are skygardens. Health and school facilities are in the lowest floors, then offices, then apartments to the first setback at level 60. 'Top class' apartments reach to level 120's setback, then 'luxury' apartments to the third at level 170. The central area is split: one side a continuous five-mile sloping public path 3.9m wide – Zhang says that residents' 'centre of living revolves around this road'. Beside it is a stack of 56 10m-high, column-free internal spaces, each of 240 sq m, whose use will vary from a bewildering variety of sports to shops, catering, entertainment, libraries, parks and two acres of organic farms. Between this and the sky tower is a 32-storey hotel with a swimming pool on level 202. Lifts will rise further, into the mast to access a restaurant, then at 830m, a coffee house. The BROAD Group logo tops it all.

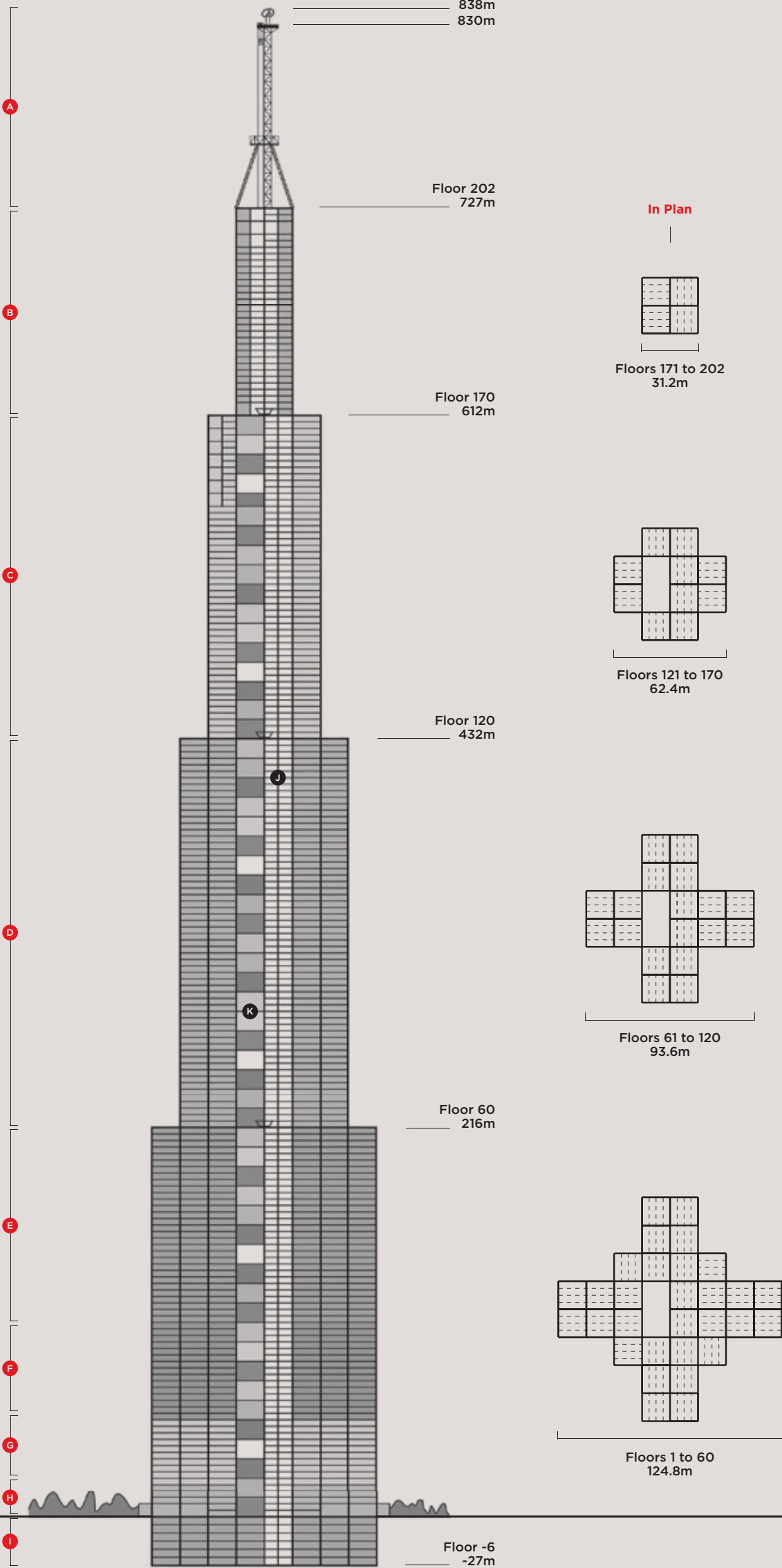
Sky City aims for maximum sustainability. Zhang says 'the air quality inside is the cleanest on Earth', yet Sky City's HVAC will use just 70kWh per square metre a year, a fifth the normal Chinese level and less than a tenth of other supertalls. Zhang knows his stuff – the BROAD Group started in the energy-guzzling air-conditioning field. Driven by an environmental passion, he spent 20 years improving technologies, and the UN honoured him as 2011 Champion of the Earth. He will apply 'all possible, practical methods for energy conservation' and lists insulation, CHP, ventilation recovery, LED lighting, regenerative lift braking, and grey water systems. China has the world's biggest carbon footprint and Zhang knows one building will make scant difference, but it will demonstrate his 'ideals, ideology and technology'. If they are followed, the impact will be massive.

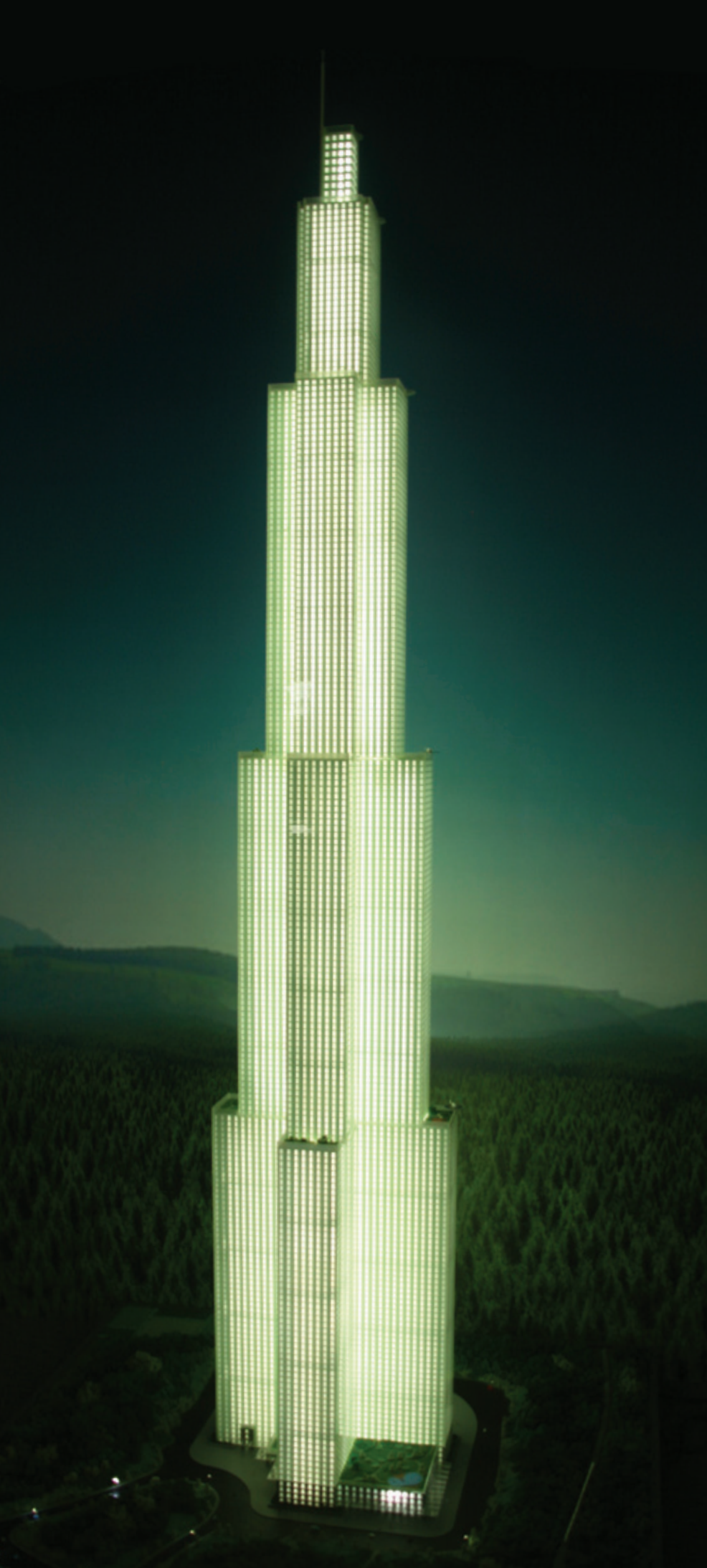
'Buildings beyond 100 storeys tall are going to become a

BOTH IMAGES CHINA BROAD GROUP

Sky City

- A**
SKY TOWER
Elevator reaches 830m
Coffee house at 830m
Restaurant at 770m
- B**
HOTEL
Floors 171 to 202
250 suite hotel rooms
Swimming pool at floor 202
- C**
LUXURY APARTMENTS
Floors 121 to 170
14 suites 520 sq m rooms
356 suites 240 sq m rooms
- D**
TOP CLASS APARTMENTS
Floors 61 to 120
812 suites 140 sq m rooms
928 suites 90 sq m rooms
- E**
MEDIUM CLASS APARTMENTS
Floors 31 to 60
710 suites 140 sq m rooms
470 suites 90 sq m rooms
- F**
SMALL APARTMENTS
Floors 16 to 30
1,160 suites 60 sq m rooms
- G**
OFFICE
Floors 6 to 15
- H**
MIXED-USE AREA
Floors 1 to 5
Middle and primary school 17,000 sq m
Kindergaten 4,000 sq m
Home for the aged 4,000 sq m
Hospital 9,000 sq m
- I**
BASEMENT
Floors -1 to -6
- J**
SKY STREET
Floors 1 to 170
10km
- K**
ONE IN EVERY THREE FLOORS ARE EQUIPPED WITH:
Basketball court, badminton court, tennis court, hand-ball court, squash court, cinema, concert hall, music room, vertical farm, flower garden, shop, coffee house, ping-pong court, gym, climbing wall, library, pool room, training room, fish pond, small forest, restaurant





standardised tall-building form,' declares Zhang, but he disagrees that they will have no sense of local identity. He contends that architects have 'made buildings look too strange... If we depart from functionality to design our buildings, then naturally different places will arrive at different designs of buildings. So, the less design there is, the more character there is. This is my view.'

It seems an odd logic, but China's hutongs, the embodiment of local community, were after all not designed by architects, for whom Zhang seems to hold little regard. He contends that OMA's CCTV building has no connection with Beijing, nor The Shard ('the really pointy building') or the Gherkin with London: 'We're being influenced by the architect's words.' Instead he offers a resident's viewpoint. 'They see buildings just like shoes and clothes. As long as you wear it and it fits, it should be enough,' he explains. 'Gilded or silver-plated things or strange forms are actually things residents don't need, but architects need, or people who sell the buildings.'

Sky City shares its functional design spirit with modernism, but when asked, Zhang says 'I haven't heard of Le Corbusier. I like Lewis Mumford.' The 20th-century American theorist challenged matters like obsolescence and 'monotechnics' such as the car. Zhang's ethos incorporates Mumford's stress on the human with new ecological concerns. He says that 'in the times of hutong, China only had a 100 million people', whereas now China has almost 1.4 bn. There's simply not the land for everyone to live low-rise, which leads to ever more cars and roads. Zhang contends that daily destinations – work, school, shopping and so on – 'should be within a 2km radius. That's the best. A 5km radius I would say is the maximum. The reality in China is the daily activity radius is beyond 20km. This is huge'. Sky City eliminates activity radius.

Blueprint put it to Zhang that while mass high-rise, high-density living works in the East, it has generated crime, drug abuse and social breakdown elsewhere. Could Sky City do the same? 'No', he says. 'Maybe you are too pessimistic about Westerners. I don't think there will be this problem. When you open your door, you have community. This is a very ideal model.'

But in this utopian environment, where everything's provided, what about individual expression? 'Of course there is room for individualisation', he replies. 'In one city, there are many different types of characters. We will not restrain these characters. Other than anything criminal, you can do anything.' Indeed, he even says never leaving the building 'is very possible, because there are hospitals. You can be born inside and die inside'. But step outside, and Sky City is surrounded by forest. It conserves 200ha for green land, 'so actually, you're closest to nature'. Zhang himself is no fan of established cities. 'I like very few places but I've seen some places in Germany where you walk maybe a few steps and you can see the farmland'.

Zhang's presentation of Sky City at CTBUH left a packed hall stunned. Arup's Bob Lang saw no infrastructure 'to empty the building in one go', but Make's Ken Shuttleworth declared: 'I think it's amazing. There's real lessons to be learned.' It's the vision of Sky City's 'very high quality of life' that may baffle the West most. Tim Johnson, chair of CTBUH, let slip: 'If our life gets that programmed, we'll probably be brain-dead'.

The West took decades to overcome the disaster of Corbusian social housing and only now is building residential towers again. 'If we rely on our own instincts, we shouldn't have these kind of problems,' says Zhang. China is changing far quicker than the West did, and it may not take long to see if the more socially mixed Sky City works. Let's wish this brave new world well. ■

9

9 – Night vision: Sky City should be home to 30,000 who need never leave due the facilities that will be provided