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Challenging Preconceptions of the High-Rise Typology

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Biography

Rem Koolhaas founded the Office for Metropolitan Architecture in 1975 together with Elia and Zoe Zenghelis and Madelon Vriesendorp. He heads the work of both OMA and AMO, the conceptual branch of OMA focused on social, economical and technological developments and exploring territories beyond architectural and urban concerns.

Rem graduated from the Architectural Association in London and in 1978 published Delirious New York, a Retroactive Manifesto for Manhattan. In 1995 he published the landmark book S, M, L, XL summarising the work of OMA and establishing connections between contemporary society and architecture.

The work of Rem Koolhaas and OMA has won several international awards including the Pritzker Architecture Prize in 2000, the Praemium Imperiale (Japan) in 2003, the RIBA Gold Medal (UK) in 2004 and the Mies van der Rohe – European Union Prize for Contemporary Architecture (2005).

Rem is also Professor in Practice of Architecture and Urban Design at the Graduate School of Design, Harvard University.

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Background

The tall building today seems only concerned with a relentless striving for height and dominance of a city skyline, if not dominance of the whole world. Often these towers are nothing more than the constant and monotonous repetition of a piece of land in the vertical direction, whose main aim is the profitable multiplication of the value of the ground. This approach has resulted in thousands of banal towers around the world, isolated from the urban fabric and accommodating merely routine activities, arranged according to predictable patterns.

This paper examines strategies utilized by OMA to challenge these preconceptions of the tall building typology, re-thinking the potential of the skyscraper for new urban manifestations. In doing so, the paper presents some of OMA's latest work in the field of high-rise design, from countries such as China, Mexico, South Korea and the USA.

Keywords: Skyscrapers, Design, Typology

Introduction

The skyscraper was born over 100 years ago, when the elevator made it possible to have access to previously unimaginable levels of a building. Also steel made it possible to build higher and faster and electricity to illuminate deeper spaces and to inject conditioned air. Over the past 100 years all these technologies have improved, but nothing has essentially changed.

Today's generation of Asian skyscrapers only compete on the superficial level of height, they do not contribute anything additional to the reinvention of the typology. Because the skyscraper is a solitary type – it solves all its problems on its own – the contemporary city has become a collection of single, separate buildings that are only connected by streets and not really integrated with the city.

The tragedy of the skyscraper is that it marks a place as significant, which it then occupies and exhausts with banality. This banality is twofold: in spite of their potential to be incubators of new cultures, programs, and ways of life, most towers accommodate merely routine activity, arranged according to predictable patterns. Secondly, their expressions of verticality have proven to stunt the imagination: as verticality soars, creativity crashes. For almost 50 years now the traditional solution for the encounter of skyscraper and city has been to place the tower on a plaza, but all over the world the emptiness of such spaces makes them an impoverished caricature of urban life. We at OMA feel this arrangement of isolated towers is no longer a credible approach for the integration of tall buildings into the urban fabric.

CCTV & TVCC, Beijing

Instead of competing in the hopeless race for ultimate height - dominance of the skyline can only be achieved for a short period of time, and soon another, even taller building will emerge - this project proposes an iconographic constellation of two high-rise structures that actively engage the city space: CCTV and TVCC (see *Figure 1*).

Figure 1: CCTV (right) & TVCC. (© OMA)

The CCTV is a 54-storey, 5 million square foot building combining administration and offices, news and broadcasting, program production and services – the entire process of TV-making – into a loop of interconnected activities. Two structures rise from a common production platform that is partly underground. Each has its own character: one is dedicated to broadcasting, the second to services, research and education; they join at the top to create a cantilevered penthouse for the television management (see *Figure 2*).
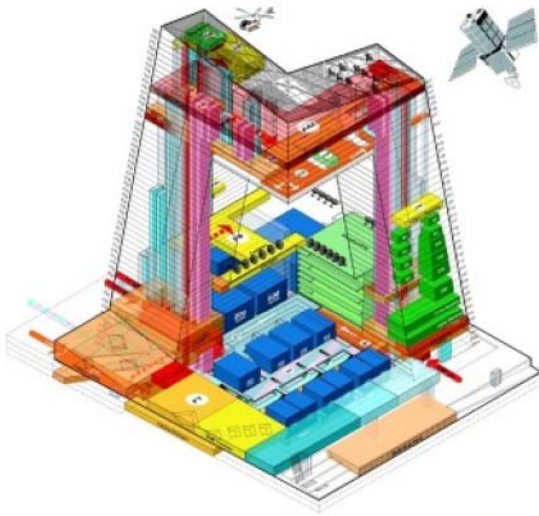
Figure 2: CCTV combines the entire process of television making into a loop of interconnected activities, promoting direct exchange between workers and visitors. (© OMA)

The 'traditional' approach to such a project would be to fragment all these programmatic functions into their individual parts: production studios in the inexpensive, industrial parts of town; administration and management in the financial district; the creative departments located in the 'hip' areas of the city. However, the consolidation of all these activities within a single building allows each employee to be permanently aware of the activities of his co-workers - a chain of interdependence that promotes solidarity rather than isolation, collaboration instead of opposition. This way the architecture itself contributes to the coherence of the organization.
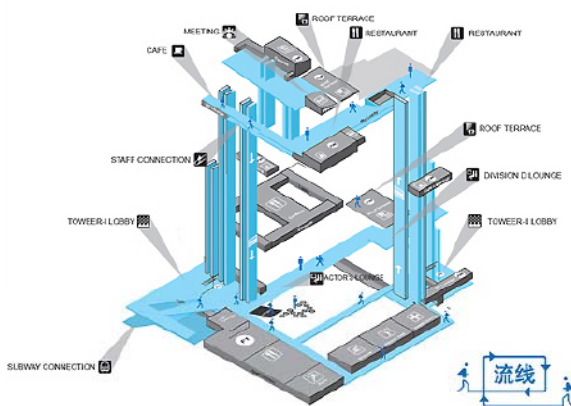
While CCTV is a secured building for staff and technology, public visitors will also be admitted to the 'loop' – a dedicated path circulating through the building and connecting to all elements of the program (see *Figure 3*). Here the CCTV can present itself as a media organization to the public, with the looped nature of the circulation becoming a circuit of continuous dialogue between staff and visitors, allowing them to observe each other, to meet and to congregate.

This looped circulation not only promotes social interaction, but also offers multiple routes of egress in emergency scenarios. Compared to a single tower comprising the same floor area, the total evacuation time of the CCTV loop is less than half that of a purely vertical structure; in addition, it offers an alternative escape path through the other tower connected by the high-level overhang.

The primary structure of the CCTV building is the triangulated surface of the loop which acts as a mega-tube element with all the inherent benefits of stiffness, redundancy, robustness and torsion capacity. A network of diagonals triangulates the surfaces of the building – facades, roofs and undersides all distribute and disperse the loads. Due to the complex geometry of the building, different areas are subject to different intensities of stress – some zones have to work harder than others.

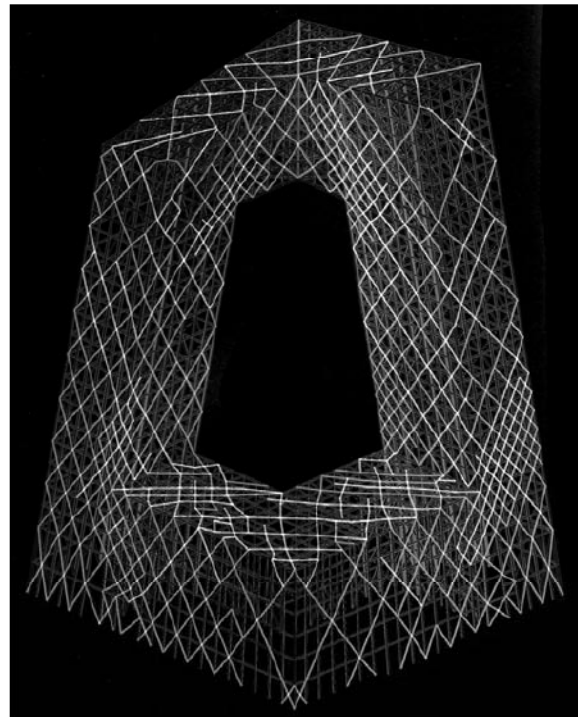Figure 3: The circulation 'loop' of the building. (© OMA)

Figure 4: Structural diagram showing the irregular structural grid, reflecting the actual stress patterns within the façade. (© OMA)

To ensure the load within the individual elements of the diagrid remain approximately the same (and thus to guarantee maximum efficiency), more diagonals are added where the forces are higher, and conversely, elements are eliminated in zones of excess capacity. The result is an irregular diagonal grid reflecting the actual stress patterns of the structure under different loading conditions, from everyday forces to severe earthquakes events (see *Figure 4*).

The design of the CCTV then aims to reinvent the tall building by creating a truly three-dimensional experience; a canopy that symbolically embraces the entire population, as oppose to a predictable two-dimensional tower that points only skywards. The creation of a continuous series of spaces and activities will promote the building as a giant social catalyst – a city in itself – where 10,000 employees will work and thousands of visitors will gain an insight into the functioning of all aspects of a television station.

Togok Towers, Seoul

The ambition of the Togok Towers project is to imagine the "next" skyscraper, both in a technical sense, and to create a 'Skyscraper Complex' - a new urban condition for the 21st century.

The breakthrough this project represents is the integration of several buildings into a larger whole (see *Figure 5*). No longer soloists, the different elements support each other in every sense: architecturally they form an integrated complex; technically issues of stability, access, circulation and servicing are organized collectively; urbanistically the entire building becomes a new kind of urban quarter for the city.
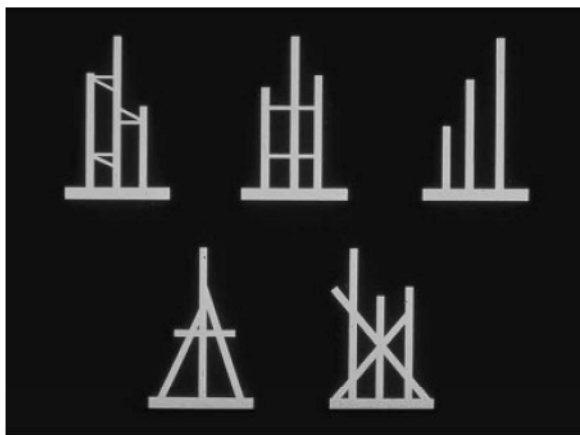
Figure 5: Study of a 'Skyscraper Complex' integrating several buildings. (© OMA)

The combination of all these breakthroughs generates a quantum leap in quality. Instead of separation, the Skyscraper Complex creates continuity, variety and programmatic richness instead of the repetition prevalent in today's high-rise. For the city this arrangement means that the skyscraper is not merely the imposition of a huge parasite, but that it now contributes to the reinvention of a new urban condition, a new way of receiving the public (see *Figure 6*).
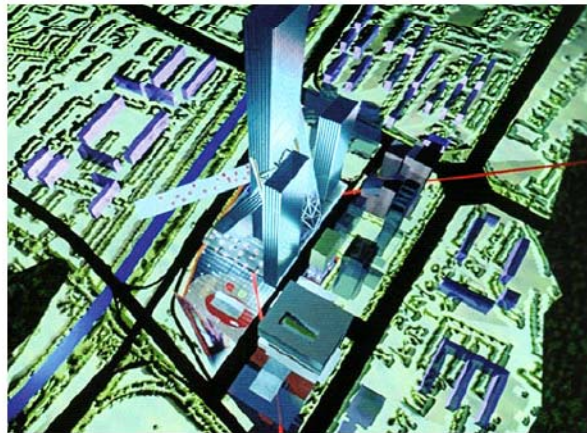
Figure 6: Togok Towers - Axonometric and aerial view of the site. (© OMA)

111 First Street, New York

This 1.2 million square foot building, to be located in Jersey City's burgeoning waterfront development, contains a diverse mix in program; apartments, a hotel and amenities, artist live / work studios, gallery spaces, retail areas and parking are to be contained within its structure. All too often, this mix would be hidden away within the confines of relentless verticality – the repetitive stacking of similar floor plates creating a banal, isolated tower. Conversely, the approach taken by OMA has been to reveal and exploit the differing programs, creating a tower that is distinctive and dynamic from virtually every vantage point.

The building massing was developed by analyzing each component of the program for optimum layout and then concentrating these into individual blocks; a cube of artist live / work studios and galleries, a slab that combines hotel rooms and apartments and a wider slab that accommodates deeper apartment units. The resultant volumes are stacked perpendicularly in plan to create a 52 storey, 180m tall tower (see *Figure 7*).

This stacking maintains the independence of each block, optimizing views from the site and creating a dynamic relationship between the building and its surroundings. Furthermore, the blocks are stacked in such a way that a range of open spaces and terraces are created between their junctions. These will house a public terrace at the 5th floor, terraces for the hotel and spa on the 17th floor and two shared residential spaces on the 36th floor.

Figure 7: 111 First Street. (© OMA)

With direct street access, the 111 First Street public terrace will activate the street life and create a synergy between the planned Powerhouse Entertainment Center and the Sculpture Garden to the north of the site. The vertical and horizontal density of public activity generated will energize the surrounding area, creating a cultural hub for Jersey City.

Torre Bicentenario, Mexico City

As Mexico approaches the 200th anniversary of its independence, it is emerging as an increasingly important urban centre both in Latin America and the world at large. Compared with the other economically ascendant regions such as Asia and the Middle East, Latin America has a significant high-rise deficit. Poised to harness the economic and symbolic potential of the Bicentennial, Mexico City will celebrate a historic moment with the emergence of a new skyscraper: Torre Bicentenario.

The form of this building – generated by the stacking of two pyramidal forms – creates a dynamic relationship between the tower and its surroundings (see *Figure 8*). The junction of the pyramids occurs at 100m high; this responds directly to the height of surrounding buildings, whilst creating a form that bulges towards the historic city centre, providing expansive views of the
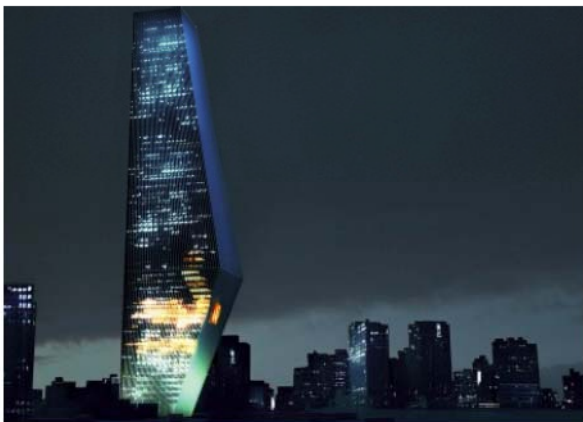
adjacent Chapultepec Park and the city beyond. Public programs are also located within this bulge; here the creation of a dynamic atrium cutting through the building's widest point will provide access to natural light and ventilation. The void twists at its midpoint, opening at the bottom toward the park and at the top toward the city. Rather than exacerbating the skyscraper's isolation, it connects the building to its surroundings (see *Figure 9*).

In an architectural age defined by the pursuit of expression at all costs, the Torre Bicentenario is building whose unique form is responsive rather than frivolous. A building whose form facilitates rather than complicates its use. An icon that offers Mexico City and the nation a symbol of the coming bicentennial, but also an important new element within the city's urban life.
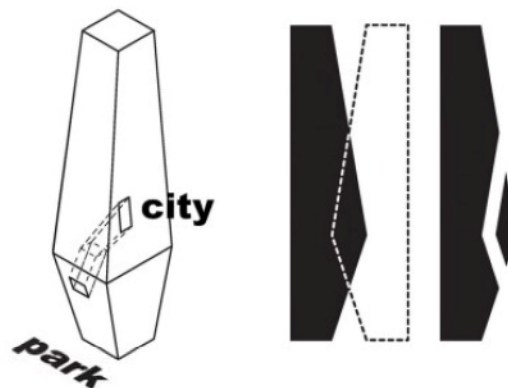

Figure 9: Torre Bicentenario – Atrium form and location. (© OMA)

Conclusion

This paper has outlined some of the latest high-rise designs undertaken by Rem Koolhaas and OMA. Alternatives to the tall building that is simply a vertical extrapolation of a single plan, concerned only with height, have been presented. These alternatives promote a new typology for the skyscraper; buildings that are truly integrated within the city, that promote social interaction instead of isolation and that offer new and exciting programmatic variety within their walls.

Figure 8: Torre Bicentenario – View by night. (© OMA)