



HARMONY IN HEIGHTS

TALL STRUCTURES ARE REDEFINING THE REALTY LANDSCAPE IN INDIA WHILE KEEPING AESTHETICS IN MIND

BY BINDU GOPAL RAO

1. Greens at Mumbai by KNS Architects is an upcoming project with one of the tallest buildings in the western suburbs of Mumbai.

In India, structures above 15 m in height qualify as a tall building while many professionals define a high-rise as a building that is at least 75 ft (23 m) tall or one that has about seven storeys. However, most countries have their own definition of tall buildings.

THE SPECIFICS

A tall building is not just about height, but also about proportion. There are many buildings, which are not particularly high, but are slender enough to give the impression of a tall building, especially against low urban backdrops. On the other hand, there are numerous big/ large footprint buildings, which are tall, but their size/ floor area rules them out from being classified as a tall building.

K Shivashankar, chief architect, Eskay Design, explains, "Tall structures or multistorey buildings don't necessarily stick to a rigid norm of design aesthetics. Most of our projects are driven by what the immediate context calls for, and what kind of identity the tower is going to reflect. From being a simple, stark, contemporary icon that looks forward into the future to ornamental, neo-classical translations of design in multistorey buildings, Chennai is speckled with a range of different design aesthetics. But, at Eskay Design, we believe in maintaining a simple, minimalist approach to the design of the façade, driven by climatic factors that guide us based on orientation of openings and shading that translate into the design aesthetic itself. The visual aesthetics of the pragmatic architectural form are realised by incorporating such vertical and horizontal shading devices that also double as an interesting elevation feature. These features have been highlighted using different shades to draw interest to the form."

MATERIAL MATTERS

Specific grades of concrete like M25, M30 or M40, and specific grades of reinforced steel bars, are used in constructing tall structures. Façade materials should be sustainable, lightweight and robust, with high resistance to fire. "FunderMax façade system installed using the rear ventilated principle can be used in combination with other materials in high-rise structures. These systems, developed by FunderMax, are made for India and are designed to withstand the extreme conditions in tall buildings," opines Ashwani Khanna, AVP marketing,

FunderMax India.

Tall buildings are made with concrete and steel structures; usually, the lower portion with concrete and upper in a steel framework. Some buildings are made entirely with steel. Various technological advances happened in the late nineteenth century that coupled to make skyscraper design and construction possible. Concrete and steel are the most preferred options of materials in constructing tall structures. There has been a move to manufacture off-site and assemble completed panels at site to speed up the construction activity. Prefab or precast structures are gaining in popularity.

"Among them was the capacity to mass-produce steel, the invention of safe and practical elevators, and the development of advanced techniques for measuring and analysing structural loads and weights. Traditionally, the walls of a building supported the structure; the taller the design, the thicker the walls had to be. Reinforced concrete is a critical component of skyscrapers. Concrete is inherently strong under compressive forces; however, the vast projected weight of the Petronas Towers led designers to define a new type of concrete that was more than twice as strong as usual. This high-strength



2. FunderMax façade system installed using the rear ventilated principle can be used in combination with other materials in high-rise structures.



material was achieved by adding very fine particles to the standard concrete ingredients; the increased surface area of these tiny particles produced a stronger bond," says Amrish T Parajiya, director, GAP Associates.

ECO SENSE

Realty, as an industry, is often said to be the most polluting of all. Tall structures, naturally, put more strain on the environment courtesy their size. Therefore, builders are considering some critical factors like seismic load, wind load, heat island effect, thermal load and solar reflective index (SRI) for different faces of the building as per the IGBC.

Yashaswi Shroff, executive director, Alcove Realty, which is part of the consortium responsible for building what is touted as the tallest structure in eastern India, called The 42, avers, "Taller buildings free up more ground for vegetation/landscaping. High efficiency electrical and mechanical appliances are utilised during construction and during operation, reducing load on resources."

In tall buildings, especially commercial office spaces, the aim is always to keep operational costs and carbon footprints low. A good way of doing this is to manage window-to-wall ratios and restrict vision panels to less than 40%. Use of energy-efficient glass or low-e glass is encouraged. While designing tall buildings, the orientation of the façade is important to minimise heat gain, especially in warmer areas.

"As architects, it is our responsibility to recommend the surface finish that would not only be the most durable with a high quality finish, but also environmentally-friendly and non-polluting. We go with trusted brands for our projects that always stand the test of time," adds Shivashankar.

DESIGN MANTRA

The modernist idea of a high-rise is designing by exposing the structural system of the building. A conscious effort is made to honestly display the structural design; thus, the aesthetic quality has been redefined to the role of a better structural

3. Amrish T Parajiya, director, GAP Associates.

4. Yashaswi Shroff, executive director, Alcove Realty.

5. Pinnacle Crest, a high-rise in Chennai, has been designed by Eskay Design.

6. The exterior façade of The 42, which is said to be the tallest structure in eastern India and is a project by a consortium including Alcove Realty.



7. Oriana by KNS Architects is modern, elegant and sharp, raising the bar for commercial office spaces.

8. Centrum by KNS Architects is one of the most premium commercial and retail spaces designed as a perfect balance between aesthetics and functionality.



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system along with innovative materials. Misbah Kapadia, founder and principal curator, Design Konstruct, explains, "New design trends in geometrical forms and a combination of complex geometric and twisty forms are trending. Newer building materials and structural engineering systems have been a great help. It is a combination of social, economic and technological developments."

The structural visionaries view building as an art made possible and functional within mechanics and physics. Ornamentation and decoration are thus avoided, making the structural system the aesthetics of tall buildings.

Ajay Koshy, head - Design Management, Brigade Enterprises, says, "In taller buildings with larger floor plates, we have seen the use of atriums within the building as a means of maintaining a more natural and comfortable environment in terms of natural light and ventilation. There have been examples of vertical gardens on the exterior and inside the atrium to enhance thermal comfort. In taller office buildings, a central core also helps in keeping the floor plates at their optimum to allow natural light into the office spaces."

Kanhai Gandhi, partner, KNS Architects, says, "The structural form should have an aesthetic appeal while being

simultaneously driven by engineering considerations. An elegant design is one that arises from engineering creativity, satisfies the requirements of efficiency and economy, and is also sophisticated. The top of the tall building is designed taking into consideration the social value, followed by scale and traditional design principles in comparison with the contemporary architectural design objectives."

TECH IMPETUS

High-rise buildings have always relied on creative designing, cutting-edge technology, and integrated systems. Efficient vertical mobility is a critical component of high-rise building development and construction. KONE has continually set new standards for innovation in high-rise projects and designs elevators for the future. "Our solutions continue to take buildings higher while making elevators, even more, energy-efficient and reliable, all the while delivering an unforgettable passenger experience. Through design, we offer solutions that can adjust to the possible changes, and this is a differentiator for us. The super-light KONE UltraRope technology and KONE JumpLift construction time lifts are a couple of innovations introduced by KONE for the high-rise industry. We



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9. Misbah Kapadia, founder and principal curator, Design Konstruct.

10. Ajay Koshy, head - Design Management, Brigade Enterprises.

11. Eskay Design's tall structures take a simple, minimalist approach to the design of the façade, driven by climatic factors.



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offer solutions for access and destination control, information communication, and equipment monitoring for high-rises," says Amit Gossain, MD, KONE Elevator India.

OBSTACLE RACE

Construction methodology adopted for tall building structures must be region-specific and as per government by-laws. Designing a tall building comes with the challenge of accommodating sway, wind and seismic loads. There are physical challenges such as scaffolding limitation, accessibility and logistics of construction materials and increased risk of fire, systems (water, accessories, HVAC, façade). All the guidelines are laid in the General Development Control Regulations (GDCR) for construction permission; however, there is a practice of single window clearance. Fire fighting in tall buildings is a major challenge.

"But after The 42, newer and modern equipment are being procured by the West Bengal Fire and Emergency Services that aid in firefighting within tall structures. Also, new regulations are incorporated with the National Building Code 2016 for aiding and guiding future development of tall structures in India. Internationally, buildings taller than 250 m are now being discouraged as such buildings become expensive to build and occupy," says Shroff.

For example, the Shanghai Tower is facing vacancy as the rents in the tower have become commercially unviable. As land prices rise, building taller seems more sensible – however, once we reach a peak of price vs height, very tall structures such as the Shanghai Tower are not about viability any more but about other emotions. In India, urbanisation is the norm of our times. This is because urban areas ensure higher quality of services that can be delivered to a population at cheaper prices. Hence, taller buildings will keep happening in India for the foreseeable future as India makes a transition from a developing to a developed country in the coming decades. 14



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12. KONE UltraRope elevator hoisting technology eliminates the disadvantages of much heavier traditional steel ropes and enables elevator travel heights of up to 1,000 m.

13. After The 42, a project by a consortium including Alcove Realty, newer equipment, which aids in firefighting within tall structures, is being procured.

14. Kanhai Gandhi, partner, KNS Architects.

15. Amit Gossain, MD, KONE Elevator India.