



STANDING TALL

High rises are commonplace in crowded urban cities where land is finite and population density continues to rise.

By Bindu Gopal Rao

High-rise structures have become essential in the evolution of urban landscapes, particularly in cities facing rapid population growth and limited land resources.

MAKING SPACE

In places like Delhi or Mumbai, high-rise development plays a crucial role in accommodating growth without over-expanding the city's footprint. Well-planned vertical development allows housing, workspaces, and retail to coexist within compact, transit-oriented zones, helping preserve open land and reduce travel distances. However, tall buildings must integrate with infrastructure and public spaces rather than exist in isolation. Their success lies in how they connect people to amenities, mobility, and the urban fabric. "From a regulatory standpoint, the Uniform Building Byelaws (UBBL) 2016 classify any building above 15 m in height as a high-rise. The term tall building, however, goes beyond this threshold, referring to structures that push the limits of conventional engineering and require specialised design for wind, structure, and safety systems. In essence, every tall building is a high-rise, but not every high-rise qualifies as a tall building in scale or complexity," says Mitu Mathur, Director, GPM Architects and Planners. Good high-rise buildings are designed to ensure that height doesn't disconnect people from nature or each other. Instead, it should enhance the quality of life, bringing the human scale into verticality.

PHOTO COURTESY PENTASPACE DESIGN STUDIO

Safety in high-rise buildings starts with a holistic approach that combines materials, design, and technologies.



Mitu Mathur, Director, GPM Architects and Planners



Hardik Pandit, Director, APICES Studio

MATERIAL MIX

High-rises today increasingly use materials that balance performance, durability, and sustainability. High-strength concrete and micro-alloyed steel allow slimmer structural elements while maintaining safety and stability. Façades now incorporate low-emissivity glass, fire-rated aluminium composite panels, and non-combustible insulation, meeting stringent fire and energy standards outlined in the National Building Code (NBC 2016) and by local building authorities. “Building-Integrated Photovoltaics (BIPV) and advanced coatings enhance energy efficiency while supporting design flexibility. Prefabricated and modular elements are also gaining ground, improving construction speed, quality control, and safety. Selecting materials that respond to climate, structural demands, and long-term maintenance is crucial for buildings that are both resilient and efficient,” says Mitu.

Contemporary high-rise construction is characterised by innovative materials that prioritise both structural efficiency and environmental performance. With growing awareness around these principles, architects are embracing lighter, smarter, and more climate-responsive material solutions. Vineeta Singhania, Founder Partner & Principal Architect, Confluence, adds, “Cross-laminated timber (CLT) has emerged as a viable alternative to concrete and steel, offering excellent strength-to-weight ratios while reducing carbon emissions. Mass timber structures are now being explored for buildings exceeding 18 storeys. Ultra-high-performance concrete (UHPC) provides superior compressive strength with reduced material volume, enabling slimmer structural elements and more efficient floor plates. Advanced glazing systems, including electrochromic and thermochromic glass, respond dynamically to environmental conditions, optimising daylight whilst minimising heat gain. Triple-glazed units with low-emissivity coatings are now standard in energy-conscious designs. Composite façades combine aluminium, ceramic, and glass to achieve thermal efficiency without compromising aesthetics.” Fibre-reinforced polymers and hybrid steel-concrete systems offer enhanced seismic resistance and durability whilst reducing construction time and material

waste. Phase-change materials (PCMs) integrated into façade systems help regulate interior temperatures by absorbing and releasing thermal energy, reducing reliance on mechanical cooling.

TRENDING NOW

High-rise architecture today is about crafting meaningful urban experiences. Modern towers emphasise community living, integrating shared amenities, landscaped terraces, and semi-public spaces that encourage social interaction while preserving privacy. Luxury living is gaining momentum, with branded residences and curated lifestyle-focused developments shaping expectations, where every detail enhances comfort, exclusivity, and quality of life. Hardik Pandit, Director, APICES Studio Pvt Ltd, says, “High-rises are moving beyond statement structures to integrated vertical communities that also focus on sustainability and occupant wellbeing. Incorporating green elements, whether through vertical gardens, green walls or even rooftop green spaces, helps to improve air quality and reduce heat, while also contributing towards a closer connection with nature within the concrete and steel jungle. A marked focus on sustainability has led to architects incorporating energy-efficient features, including solar panels, energy-efficient insulation on facades and rainwater harvesting



Gaurav Sanghavi, Co-Founder & Principal Architect, Pentaspace Design Studio



Vineeta Singhania, Founder Partner & Principal Architect, Confluence

systems to reduce the structures’ overall carbon footprint.”

Visually, structures are becoming sleeker and more efficient as a response to the constraints of space and efficiency. At the same time, architects are incorporating cultural elements that reflect India’s rich and vibrant heritage, which pay homage to the location of the structure without compromising its inherent efficiency, as a means of rooting the structure as a visual landmark.

BE SAFE

High-rise structures have become essential in the evolution of urban landscapes, particularly in cities facing rapid population growth and limited land resources. Safety in high-rise buildings starts

with a holistic approach that combines materials, design, and technologies. For instance, in Delhi, high-rises above 15 metres must comply with the National Building Code (NBC 2016) and secure a valid Fire No Objection Certificate (NOC) from the Delhi Fire Service (DFS). Key considerations include fire-rated structural elements, clear escape routes, smoke and fire detection systems, and automated sprinklers. A critical consideration is the use of fire-resistant materials. Cladding or façade elements with a fire resistance level of at least 120 minutes, such as Aluminium Composite Panels (ACP) or solid aluminium sheets, help prevent the spread of fire. Gaurav Sanghavi, Co-Founder & Principal Architect, Pentaspace Design



PHOTO COURTESY, CONFLUENCE

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High-rises today increasingly use materials that balance performance, durability, and sustainability.

PHOTO COURTESY, GPM ARCHITECTS AND PLANNERS

Studio, says, “In coastal cities like Mumbai, safety measures must address wind and seismic load mitigation, given the combination of reclaimed land and humid, breezy conditions. Fire safety is of utmost importance—pressurised staircases, refuge floors, and compliance with local fire norms are mandatory. Real-time structural monitoring during long construction phases is essential, especially as hybrid structural systems are still common in India. Equally important are façade safety and maintenance mechanisms, such as façade access systems that ensure safe installation and long-term upkeep, preventing accidents from falling materials or glass panels.”

OVERCOMING CHALLENGES

Construction of tall buildings presents a unique set of challenges spanning design, engineering, and execution. Structural complexity increases with height, requiring attention to wind loads, seismic resilience, and foundation design. Coordinating multiple systems—from MEP to



PHOTO COURTESY: CONFLUENCE

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fire safety and vertical transportation—demands precise planning and integration. Site constraints in dense urban areas can limit material storage, staging, and equipment movement, affecting timelines. Quality control, safety management, and logistics become critical, especially when adopting modern techniques like prefabrication or modular construction. High-rise construction in India faces unique challenges, from wind-load engineering and vertical logistics to long project timelines. Technologies such as Mivan aluminium formwork systems have accelerated concrete construction, offering safer and faster alternatives.

“Service coordination across multiple floors can be complex; hence, Building Information Modelling (BIM) plays a key role in detecting clashes between structural and service layouts. Budget overruns are another concern, as prefabrication and steel structures are still emerging in India. Prefab technologies, though faster and cost-efficient, are yet to gain widespread adoption beyond cities like Hyderabad. Additionally, the overuse of concrete in urban cores contributes to urban heat islands, raising city temperatures by several degrees. Thoughtful integration of green pockets, water bodies, and breathable façades is essential to counteract this,” says Gaurav.

With the rise of AI, intelligent building systems are also becoming standard—automating lighting, HVAC, and access controls to create smarter, more responsive environments. Additionally, designs are increasingly focused on natural light and ventilation to minimise energy loads and enhance occupant well-being. **A&I**



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