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WHAT INDUSTRY WANTS!

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QUICK BYTES

- Elevator design and placement affects structural stability, space use and costs.
- Smart technologies improve efficiency and user experience.

Just as well-planned roads in a city boost residents' mobility and improve trade and commerce leading to its growth, a well-designed vertical transport system in a building, including its elevators and escalators, is its lifeline, according to **Bharat Vishnani, Senior MD & Country Head, Lerch Bates**.

Apart from their obvious function, **PS Sudheer, Principal Consultant, AEC Asia Inc,** points out that elevators and escalators have transformed into vital elements of a building's personality and design. "By combining smart placement, thoughtful, creative design and cutting-edge technology, today's elevators and escalators don't just move people but transform spaces and enhance

above the low zone is also yielded, thereby delivering a commercial benefit to the owner.

Several other elements of elevator design affect the structural design. Among these, Kulkarni lists the number of lift shafts, shaft dimensions, shaft partitions, elevator door opening sizes, weight of the cables and car, single-entry or multiple-entry cars, support rail locations and their fixing, opening in wall to avoid piston effects, elevator pit depth, machine room sizes and lift overruns, building movements under wind loads, etc.

Opting for newer elevator technologies can help save the space needed for vertical transportation by optimising lift shaft numbers while it can also impose certain restrictions on the structural design. For instance, as Kulkarni points out, "We opted for double-decker elevators for a project to improve the lifting capacity and thus optimise lift shaft numbers and waiting time."

"Elevator lobbies are spaces where the visitor first interacts with the built form."

- Vishal Sharma, Founder Partner & Principal Architect, Confluence

"Twin-elevator technology, two elevator cabs in a single shaft impose more stringent movement limitations on the structure while also requiring crash decks/slabs," he continues. "It requires increased coordination for the overrun and pit depths."

Further, the opening sizes and location of the lift doors at the interchange levels would have to be mutually decided by all stakeholders, he says. "Piston effects are more critical for such shafts; essentially, the air balancing and openings in the shaft walls must be carefully planned."

"Today's elevators and escalators transform spaces and enhance the way buildings are experienced."

- PS Sudheer, Principal Consultant, AEC Asia Inc

Scenic lifts

Sometimes, the architect comes up with the idea of making the most of a view and therefore decides to place the elevators such that users can enjoy these views while travelling up and down, observes Mahimtura.

Outdoor integration has its beauty, notes Sudheer. "Glass elevators on the outside of buildings offer breathtaking views while doubling as architectural showpieces. Outdoor escalators connect communities separated by challenging terrain."

In such situations, Mahimtura explains, the traditional core is eliminated and, in its place, other elements are introduced in the structure. "One way is to treat the core like three I-beam sections in concrete and, sometimes, we replace the same with channel sections in concrete at two ends and one I in the centre of the lift core. Typically, such alternative treatments of the core are possible only in buildings of up to 30 to 40 floors. You avoid such variations in taller buildings."

Structural engineering in such installations must take into consideration the eccentric nature of the lift installation and its support, framing support to the glass enclosure, and the absence of a concrete enclosure around the shaft as this reduces the structural stiffness of the building, says Kulkarni. "Also, the secondary steelwork supporting the external façade glazing must be protected against corrosion."

Scenic lifts have mostly been used in hospitality projects and a handful in commercial buildings and malls, usually in parts of the building overlooking the central atriums, he continues. "Some such tall hotel building examples are the Burj Al Arab and Emirates Towers in Dubai, and Godrej One Vikhroli, R City Mall, Oberoi Mall and the Ashford Centre in Mumbai."

In Ashford Centre, a commercial structure in Lower Parel, Mumbai, "the elevator that is visible from the road has a circular shape and we gave it a glass protection," says Mahimtura, the structural consultant. "In other instances, say in a mall, you might not need a protective glass layer."

Material palette

Given the heavy human traffic elevators endure, the materials need to withstand wear and tear while maintaining a polished appearance, according to **Khozema Chitalwala, Principal Architect, Designers Group**. At the Fairfield by Mariott Mumbai, he used lightweight yet robust materials like aluminium panels and steel, finishes that not only