

# MADE FROM STEEL

If there is one material that is integral to the building process, steel is what comes to mind immediately.

BY BINDU GOPAL RAO



Over the course of time, steel structure designs have been pursued by the developers of universities, hotels and other commercial projects. Residential or commercial tower construction in our country still relies primarily on conventional systems such as conventional shuttering ply and, secondly, on aluminum formwork systems. Logistically, Indian developers still prefer the in-site construction using conventional or aluminum formwork rather than using pre-cast manufactured at a yard and supplied at the site.

"Pre-engineered buildings (PEB) are the ultimate solution to developer problems. With the surge in innovations in the robotics and mechanical space, various new construction plant and machinery technologies can aid in using pre-cast or PEB methodology. We see probably 18-20% of our structural construction job being done in steel building design or PEB design within the next 7-9 years," says **Swadesh Anand, director - EPC, Paradigm Realty.**

**Prashant Tyagi, director, BL Kashyap & Sons,** adds, "Steel buildings/ PEB are gaining popularity in many industries because of the advantages they offer. Entrepreneurs these days are keen on value for money and look for viable operations of their businesses. Steel buildings/ PEB help meet

these two criteria significantly in India, and we see more industries adopting them. Steel structures have a great demand in IT campuses, commercial buildings, malls, airports, warehouses, hotels, residential complexes, factories and manufacturing facilities, healthcare, transportation, and oil and natural gas segments. With the Indian economy growing at a healthy rate, we expect these segments to drive demand for steel buildings and structures. As one of the integrated players in the market, we expect to continue to maintain the growth momentum in the coming years."

## ADVANTAGE STEEL

Blue-chip developers are considering steel as a viable construction option because they are aware of the fact that time, indeed, is money in the real estate industry and there is no other better suited material than steel. Steel has several advantages over conventional RCC construction. Steel is leaps and bounds ahead as far as the speed of construction is concerned.

"The flexibility in design is a boon for designers. Take any super structure around the world and it will be made of steel. If parametric architecture is the future, steel is the means to achieve it," says **Piyush Mehra, PS Design.**



▲ Sustainability and durability are the key merits of steel buildings.



“UNLIKE CONVENTIONAL RCC, A STEEL BUILDING INVOLVES A FAR MORE RIGOROUS DETAILING AND DECISION-MAKING AT THE DESIGN STAGE.”

AMIN NAYYAR



“IF THESE STEEL CONSTRUCTIONS ARE MANAGED PROPERLY, THEY HAVE GOT BETTER STRENGTH THAN THE CONVENTIONAL ONES.”

DEBEN MOZA

**Deben Moza, joint CEO & executive director, project management services, Knight Frank India**, opines, “Comparatively, it possesses higher strength-weight ratio and is faster to erect. So, when we see modern construction happening, especially in the warehousing and the industrial sector, it is mostly steel. If these steel constructions are managed properly, they have got better strength than the conventional ones. Apart from that, there is an ease of expansion. If someone wants to build a structure in phases, the steel structure in terms of expansion in phases is easier and it's easy to repair and modify. You can always make changes in the steel structure, which is very difficult in a conventional structure.”

**Aunirban Saha, director of construction, marketing and sustainability, SAHA Groupe**, says, “India is a price sensitive market and as steel construction involves huge investment, the adoption has been relatively slower. The trend is still new in the Indian market. However, as the market grows and there is a lot of pressure on builders for faster delivery of projects, steel construction can prove to be a boon. It becomes extremely relevant for large township projects and commercial projects that need quick turnaround time.”

#### GOING GREEN

Sustainability and durability are the key merits of steel buildings, and there has been a shift in demand with the green construction movement gaining ground in India. However, using recycled steel to support such a movement is still a practice rarely seen in the construction material market place.

“There needs to be tax relief or some kind of compensation on 'green steel' so as to propagate its use in our market place. With the advanced manufacturing innovations in our European counterparts, we would be able to devise a way to economically make the said product,” avers Anand.

Green building construction has been gaining momentum in the last few years with developers increasingly focusing on it. Advanced sustainable practices, such as zero net emissions, which account for zero-energy buildings (buildings that produce as much energy as they consume over a full year) are in vogue. Steel structures contribute significantly in ushering in the zero-energy concept. In the process, carbon footprint is also reduced, as steel structures are pre-fabricated and erected on-site without contributing much to local environment pollution. Steel structures are also sustainable, as they can be dismantled and recycled unlike conventional buildings. Increasingly, steel structures are becoming integral to green buildings.

**Sunita Reddy, proprietor, chief architect, ACME Design-**

ers, avers, "As PEB structures are fast to build and even if they wish to demolish and shift the premises, they can reuse all steel members. Or even sell them. That would not be possible in other conventional styles of building or structures. We have already explored working on steel structures up to 15 m high and within 20,000 sq-ft areas. We are expecting more commercial spaces with larger areas and high-rise structures too. We are also experimenting with the mixing of various locally available materials with steel to give a new dimension to current methods."

**SAFETY CONCERNS**

Safety is of utmost importance in any structurally-engineered project. Steel framing does really well under high wind loads because it is ductile, which means it has the capability to bend without breaking and can absorb that kind of energy. It is also a safe option as there are no health hazards using steel in construction processes. Keeping in mind the safety of the labourers, all the steel fittings and attachments must be inspected and maintained before use.

"With a strong commitment towards safety, every project takes all required safety measures to warrant safe and sustainable working environments taking into consideration the guidelines from the UN & WHO. In addition, we have strict procedures and protocols to ensure safe steel products, which we use for building construction. They are certified by the highest quality testing agencies. The fact that we are working with renowned brands and companies is a direct testimony to the safety of the products we use. We identify EHS risks associated with our business activities and make efforts to reduce these through mitigating controls. Hazard control methods implemented are elimination, substitution, engineering, administrative and 100% use of mandatory personal protective equipment. We audit our businesses and seek assurance that EHS requirements have been implemented and are effective. All department heads prepare a report at a predetermined frequency on how they have applied our business principles and standards, and the effectiveness of the controls in place," adds Tyagi.

Moza adds, "We have a safety policy and follow the international guidelines for safe construction like OHSAS (Occupational Health and Safety Assessment Series) and ensure environmental safety and quality assurance. We ensure that people on ground understand the safety procedures and our team is present to implement those. So irrespective of steel structure or RCC structure, the safety standards remain the same. There is additional focus on safety measures for steel structures because we have to lift the heavier and larger steel



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“POST FACTORING THE TIME VALUE OF MONEY AND TAKING INTO ACCOUNT THE FASTER

DELIVERY IT FACILITATES, IT IS A SURE-SHOT WINNER.”

**MUKESH JAITLEY**



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structures to a greater height, so we ensure that the precautions are taken, and the necessary equipment are in place.”

#### SKILLING ISSUES

Construction of steel buildings requires well-planned placement of steel fittings and attachments. The placements need to be such that it helps in the long run and ensures stability of the building. “Steel requires skilled labour and most of our available workers in India are unskilled. But I see a ray of hope with the Indian government’s skill development initiative in the equation. I hope the government will work with the urban development ministry and chalk out a plan to skill India’s existing labourers,” says Mehra. Labour for steel construction have to be specialised in handling and fixing steel girders, pipework and beams that form the framework of buildings and large structures.

**Amin Nayyar, CEO, ANA Design**, says, “Unlike conventional RCC, a steel building involves a far more rigorous detailing and decision-making at the design stage. Things cannot be left to chance since on-site changes are virtually impossible in a steel building. Therefore, using a better quality of detailing and visualisation such as BIM is necessary to ensure the correct outcome of a design process.”

**Mukesh Jaitley, director - projects, The Wadhwa Group**, says, “Structural steel buildings or PEBs are addressing parameters including finishes, environment control and life cycle with a panache derived from product innovation and technology advancement. Hence, there has been a decent shift in demand. Initially, any technology would cost higher than the conventional method, however, post factoring the time value of money and taking into account the faster delivery it facilitates, it is a sure-shot winner in the whole project cycle.”

Steel certainly seems to be the way forward for the industry and it is only a matter of time when it becomes the norm as far as buildings are concerned. **CW**