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With an urge to break-free from conventional outlook on business enterprises in J&K State & to bring about a professional uprising, Simula Infra-Development under the aegis of Simula Group of Companies is spearheading a corporate revolution in the Reality & Infrastructure space. The dream to bring about change from a contemporary urbanization has taken its logical shape. With an endeavor to offer world-class living environment to the residents of Jammu & Kashmir, Paradise Avenue has been conceptualized, designed & is going to be implemented keeping the needs & aspirational requirement of the new-age customers



PARADISE AVENUE JAMMU

revolutionizing structural solutions in housing segment

It all starts with an idea. Like a small seed planted in a genius mind; the thought of a sophisticated contemporary urban space dwelling was born. Like all brilliant ideas, 'this urban space' would be a life-changing experience, not only for the promoters, but, also for all associated with it. Any good idea needs to be coupled with proactive planning and action orientation for its germination. Thus, the saga of understanding the future inhabitants was initiated.

The promoters Simula Infra-Development wanted a landmark, hence, appointed Newton® Consulting Group Inc., an International Business Communication Consulting organization with a scientific approach that creates solutions in alignment to customer futuristic need. Once the concept of the requirement was studied and analyzed, Stonehenge™ - a global award-winning architectural consultation firm was appointed. Newton® synergized its insights with Stonehenge™ to create the best urban concept ever developed - called 'Paradise Avenue'. This project comprises of three towers, with a total of about 7 lacs sq. ft. of built-up area spread over 15 floors. Towers A1 & A2 are still under construction, and Tower B which has been completed is covered in this feature.

Germinating the Notion

Consumer truly is the king, and this adage holds more water in Paradise Avenue, where every brick, every mortar has been laid keeping consumer needs, likes and interest in mind. For Tower B primarily, the objective was to produce a design that can be executed on time whilst maintaining high quality standards, considering the limitations existing in Jammu. A high rise in concrete would have been cheaper, but, might have taken a long time, and the consistency of quality on upper floors could have been a challenge. Hence, the promoters, architects and structural consulting team of Skeleton Consultants Pvt. Ltd. - comprising Er. (Dr.) Abhay Gupta and Er. Saurabh Sharma - conceptualized a structural steel frame with most of its components being prefabricated off-site, with modular panels even for floor and the walls.

Opting For Steel

In Jammu, it is a challenge to take up construction activities across the year citing the climatic conditions. Also, during few months of the year, the working hours are even less than 6 hours in a day. Temperature during a particular period is much below and concrete quality with respect to workability and its maturity may not be achieved

Steel Tonnage Consumed:

Building Component	Tonnage
Hot Rolled and Built-up steel used in main frame columns, beams staircases lift well and secondary structure	1000 MT
Cold Formed galvalume steel walls with accessories used as periphery walls partition walls and steps of stairs	140 MT

Challenges & Solutions

Challenges	Solutions
Component fabrication	Offsite work in an automated workshop
Elements tolerances	Fully computerized plate cutting and fabrication
Connection	BIM software employed by Kirby for detailing
Anchor bolt installation	Alignment was important with emphasis on grouting for strong holding
Preventive measures	Strict quality control and safety measures on site
Steel installation	Vertical alignment was ensured by total station. Connections done meticulously

upto the required standards for such a high rise construction. With all these limitations, off-site construction of components was the best solution. Precast RCC components need a highly sophisticated plant, and also the weight of components is huge from the transportation point of view. Hence, prefabricated steel components which are stronger and lighter in a plant situated anywhere in the country was the best solution. Selection of structural steel for the building framing system brought numerous benefits to the project. All other materials were evaluated against structural steel, and steel was the best material of choice.

There are many benefits of using steel in construction, and in this project, steel was selected considering the below factors:

- Speed of construction
- Definite project costs
- Reliable and predictable
- Better quality structural system
- High strength
- Design flexibility
- Aesthetic appeal
- Less carbon footprints

Building Features

Concrete has been used in foundations and till stilt parking. The building has stilt + ground floor + 12/13 stories with approx. 12,000 sq. ft. floor area having about 100 apartments and it also adheres to green building requirements. The project has a health club with gym, swimming pool, garden and shopping complex. All flats have large size rooms for dining, drawing, balcony, bedrooms, kitchen and bathroom.

Structural Aspects

The building is pre-engineered and designed in strict accordance with stringent Indian standard (IS Codes) and detailed intricately to take residential occupancy into account. The

joineries, connection and junctions are seamless. Another aspect pioneered in the project was to use dry wall concept to reduce dead load of the building, thereby, keeping light foundations giving more usable space to consumer as steel walls are thinner than block walls/brick walls, yet stronger to resist high wind gust.

Paradise Avenue high rise has primary framing, i.e., columns and beams using plate fabricated built-up sections of steel grade 345 MPA. Floor supporting joists are cold formed galvanised sections resting over the beams. The floor comprises of metal deck sheet with 100mm foam concrete and 40mm thick floor finish. For effective lateral load resistance, cross bracings have been used in addition to OMRF.

Structural Uniqueness

Paradise Avenue is designed as Ordinary Moment Resisting Frames (OMRF) with cross bracings ensuring ductile behaviour during the earthquakes. Having located in seismic zone V, it is imperative to have a structure flexible and low weight, as heavier structures attract larger forces when an earthquake occurs. Forces in the structure are reduced and its foundations are therefore lighter. This reduction of design forces significantly reduces the cost of both, the superstructure and foundations of a building. Steel structures are generally light in comparison to those constructed using concrete.

As earthquake forces are associated with inertia, they are related to the mass of the structure, and so reducing the mass inevitably leads to lower seismic design forces. Some steel structures are initially light such that seismic design is not critical. A regular prismatic structure, axi-symmetrical right from ground



ER. (DR.) ABHAY GUPTA

Director
Skeleton Consultants Pvt. Ltd.

“ We enjoy designing with steel. Steel provides flexibility of configuration and reliability of execution, being a factory made quality product. Our country needs many more such structures. Besides high rise, several low-rise and mid-rise houses should use steel as basic material of construction. This will speed up the construction, and the gap between demand and supply in housing sector will reduce subsequently. The quality issues due to human factor and local site conditions shall be eliminated ”

floor to top about both the axes, very much seismic resistant. Aspect ratio of building is about 2 in one direction and about 1 in the other. Plan aspect ratio is 2.5. No large cantilevers and hence, stable configuration.

This was a challenging project in the sense that the location was tough and soil conditions along with topography were not much favourable. Moreover, this is the first project in the country in residential sector with large occupancy and in seismic zone-V. MGI-Kirby combination did well to execute the concept and design produced by architects and consultant. ■