

LIGHT HOUSE PROJECT (LHP), INDORE (M.P)

By-line | Innovative Technology for Rapid Housing Construction

LHPs are model housing projects with houses built using shortlisted alternate technology suitable to the geo-climatic and hazard conditions of the region. This will demonstrate and deliver ready to live houses with speed, economy and with better quality of construction in a sustainable manner. These LHPs shall serve as LIVE Laboratories for different aspects of transfer of technologies to field application, such as planning, design, production of components, construction practices, testing etc. It furthers the transformative vision of the Hon'ble Prime Minister and his belief in technological advances to rapidly deliver low-cost housing that meets stringent environmental, societal, quality and economic standards.



LHP Indore comprises of 8nos of identical towers having Stilt+8 floors and one community centre. A total of 1024 flats shall be built in Pre-Engineered Steel Structural System with prefabricated sandwich panel system technology. The total proposed built-up area of one tower is approximately 61202 sqft. Each tower is a typical rectangular block with symmetrical plan.

The structure is envisaged as a steel-concrete hybrid structure where the substructure up to the plinth level is constructed in RCC and the superstructure using RCC shear walls & Pre-Engineered HR steel frame.

Prefabricated Sandwich Panel System

It is made out of cement or calcium silicate boards and cement mortar with EPS granules balls, and act as wall panels.

Special features:-

- Being dry walling system, brings speed in construction, water conservation.
- The sandwich panels have light weight material as core material, which brings resource efficiency, better thermal insulation, acoustics & energy efficiency.
- Being light in weight results in lower dead load of building & foundation sizes.

Unanimously Steel

Structural steel was the unanimous choice; being light weight and high strength material, structural steel offers great degree of flexibility and sturdy behaviour.

Structural System

The super structure system is designed as Ductile RC Structural walls with few Special moment frames in both directions. Special moment frames are designed as rigid jointed frames to cater lateral loads in addition to gravity loads and others frames are designed as pinned jointed frames to cater gravity loads only. The floor system comprises of steel beam with concrete slab over profiled metal deck sheet. The total design lateral force is resisted by the Shear walls & columns-beam frames in proportion to their lateral stiffness at all floor levels. However, RC Shear walls are additionally

checked for 100% base shear with $R=4$ in X direction (along length) and for 75% base shear with $R=5$ in Y direction (along width) considering Dual system. Steel columns are analysed as pinned base over foundation. Through rigorous analysis and design iterations, the structural stability is ensured while satisfying the budgetary constraints as well as time constraints.

Salient Features

- Rectangular shaped plan: symmetrical in mass and stiffness.
- Building located in earthquake zone-III with $IF=1.2$
- Use of light weight prefabricated sandwich panel system.

Challenges

There were quite a few complexities involved while designing this project. The locations of special moment frames were chosen carefully to satisfy design requirement for lateral forces due to Wind & Earthquake and aesthetics & functional requirement of building. RCC Shear walls are provided in Core areas like Staircase & lifts only. Connections of Columns & Beams is designed in accordance with the codal requirements for Earthquake resistant design. Prefabricated sandwich panel system shall be installed in such a way that it's easy and fast for erection and does not block any functional requirement of building.

Fast Facts

Client: KPR Projectcon Pvt. Ltd., Nashik

Architect: Sthapati Associates Pvt. Ltd.

Structural Consultant: Skeleton Consultants Pvt. Ltd.

Structural Steel: Approx. 2600MT

Status: On going

Structural Working Team: Er. Nitesh Agrawal, Er. Sumit Verma, Er. Sameem Ansari, Mr. Joby Joseph.

For more Details,
Visit : www.skeleton.in

