

Q What is your view on use of Composite vs CFT in High Rises?



In the world of rapid construction & high-rise structures, replacement of conventional RCC systems with new technologies is need of the hour. Steel structures are being used since ages but besides being costly, they have issues of corrosion, fire and buckling. A combination of Structural steel & RCC termed as composite construction has evolved an efficient system for not only faster but economical construction. Two forms of composite construction are use of ENCASED STEEL SECTIONS (ESS) & CONCRETE FILLED TUBES (CFT). These both have inherited the good characteristics of both materials. However, when comparing on some parameters, a broad overview based on research, analysis and usage indicates that:

- CFT are slimmer than ESS.
- CFT takes a little lesser time than ESS, approx. 10% less.
- Moment Connections are complex in CFT than ESS.
- Concrete filling is a tedious job in CFT and compaction cannot be achieved properly. Final quality of concrete cannot be evaluated.
- Column splices are exposed and need architectural treatment in CFT but in ESS these are encased.
- Fire resistance of ESS is achieved by default due to concrete encasing but in CFT it has to be externally done and increases cost.
- Construction sequence in ESS is more convenient and reliable as the bare steel section can be erected first and few floors can be progressed. However, in CFT, till concrete is filled in tubes, upper levels cannot be erected.

Overall, CFT is costlier than ESS by about 30 – 40 per cent for columns. For horizontal members, not much use of CFT has been seen.

DR ABHAY GUPTA

Director
Skeleton Consultants Pvt Ltd

In India concrete is very popular material of construction especially in case of medium and low rise buildings. In case of high rise buildings steel is used now. However, the composite construction is not that much popular. It is possible that composite construction can be beneficial in case of medium and high rise buildings in considerably less thickness of slab and helps in saving concrete quantity.

The advantage of metal deck is that no backfilling is required which helps in clean construction. Finishing activities can be started without any steel section, with a continuous distribution of steel provides a stable high strength in axial and shear in composite sections.

On the other hand, Concrete Filled Tubes (CFT) is the composite technology which uses both steel and concrete as its integral part and thus forms a high strength structure.

The greatest advantage of the CFT column is that it can be designed with small cross section to achieve the same compressive force. The use of CFT structure is suitable for high rise commercial building construction and it is expected that in future the demand of CFT will suitably increase. The Move towards Construction mechanization and automation can be greatly achieved by CFT Structure & dependency on manual labour can drastically come down.

KRISHNENDU GHOSH

VP-Projects
Forum Projects Pvt Ltd