

Dear friends,

As we have progressed up to the plinth level, concreting would now be our prime activity. Hence, in this issue, we have covered a very relevant content on concrete from our Concrete and Aggregates section.

In this issue, we shall present a unique offering from our basket – the structural lightweight concrete.

Hope you shall enjoy reading. Keep sending us your valuable feedbacks and suggestions for further improvement. We would like to extend our sincere thanks and gratitude to the readers who have already advised, enriched and encouraged us with their valuable suggestions, advices and requests.

Happy reading. Keep well, stay safe.

New Technology in RMC - Structural Lightweight Concrete

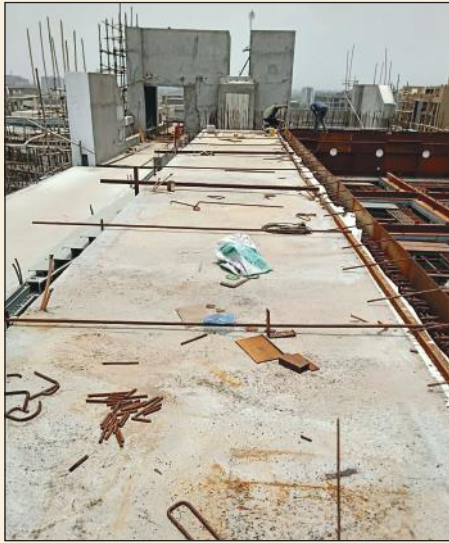
Structural lightweight concrete is gaining popularity over regular concrete in the construction sector, due to the fact that it has strength comparable to regular concrete, and yet, is typically 25-50% lighter, like aluminium is to steel in the automotive industry. Its density ranges from 1,000-1,800 kg/m³ and its strength ranges from 10-40 MPa. The American Concrete Institute (ACI) states that structural lightweight aggregate concretes possess a 28-day compressive strength of roughly 17 MPa and above, while weighing not more than 1,850 kg/m³. Structural lightweight concrete is made of processed aggregates such as expanded or sintered clays, shale, slates, fly ash, and slag, or with naturally occurring lightweight rocks like pumice and scoria. Low concrete density is

achieved by using low-density aggregates and a specific concrete mix design, which enables it to offer significantly higher building design flexibility than regular concrete. It also increases overall cost savings. The main advantages of a structural lightweight concrete structure are:

- Lower Dead Load
- Improved Seismic Structural Response
- Longer Span
- Improved Fire Ratings and Fire Endurance
- Improved Thermal & Acoustic Resistance



The 50% lesser load of structural lightweight concrete, as compared to normal concrete, came as a blessing to one of our clients in Surat, where Nuvoco developed and supplied M15-grade structural lightweight concrete of density 1,200 kg/m³, for the construction of precast structural elements for toilet



blocks, which needed to be shifted to Mumbai, 300 km away, by road. The specialised, engineered product offered easy handling on a table-tilting type precast framework, coupled with high early strength for early deshuttering, which helped improve factory output by 30%. The self-curing property also helped lower the water requirement for the curing process. Overall reduction in precast element weight considerably reduced trucking and placement costs, as well.

The property, that the lower density of the concrete reduces the overall dead load of structures, was recently utilised by a client to make a one-of-its-kind glass-bottom, hanging swimming pool. Enormous steel girders supported the swimming pool between two 13-storied residential towers and using normal concrete for the pool

deck was out of the question. Nuvoco worked closely with the client and developed a concrete solution with 35% lesser load and the same mechanical properties as normal concrete. The structural lightweight concrete, with density 1,600 kg/m³ and strength of 25 MPa, was highly beneficial and formed a weathering course.



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Write-up contributed by panel of experts from our Construction Development & Innovation Centre, Mumbai.

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