

High-Rise Projects Dispel Common Myths About Lightweight Concrete

Crews at the Wilshire Grand Project in Los Angeles pumped concrete over 60-stories. (Photo Courtesy: Wilshire Grand)

Houston's latest skyscraper, Market Square Tower, (right) soars well above Preston Street. The stunning height of this residential high-rise is made possible by structural lightweight aggregate.

Each floor of the building contains lightweight concrete, allowing the tower to attain maximum height despite geotechnical issues down below.

Guy Jackson, principal with the architecture firm Jackson & Ryan of Houston, explains. "It's a 40-story building next to a 12-story garage I did back in the 80's and that presented some geotechnical issues with the foundations. We couldn't go as tall as we did go without using lightweight structural concrete for the frame. We'd be three or four floors shorter if we'd used conventional concrete."

Structural lightweight concrete offers design flexibility and substantial cost savings including less dead load, improved seismic structural response, better fire ratings, and less reinforcing steel.

This project also dispels a common myth: that lightweight concrete can't be pumped to great heights. "We have example after example of projects where we've done just that," says Jeff Speck, P.E. of Trinity Lightweight. "We've got projects in Houston where we pumped concrete over 40-stories, a project in Chicago where we pumped over 50-stories, 60-stories in Los Angeles at the Wilshire Grand Project, so we we have example after example that shows that truly is a myth. We can pump lightweight concrete successfully to great story heights."

Speck notes another Houston high-rise project, 609 Main at Texas, pumps lightweight concrete several stories and obtains an extra benefit from the use of the product. "Another aspect of 609 Main that is unique is the compressive strength of the lightweight concrete. It goes as high as 7200 psi which dispels another myth about lightweight concrete that you can't achieve high compressive strengths."

Today, pumping technology has improved. There's also a better understanding on the best way to use lightweight aggregate in this application. One of the most important steps is to make sure the product is prewetted. This process prevents the lightweight from absorbing water during the pumping process, minimizing slump loss, and maintaining consistency.



Market Square Tower rises above downtown Houston in this June 2016 aerial photo.



609 Main at Texas uses lightweight concrete with compressive strengths near 7200 psi.



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