

Holcim Plant

Location: St. Genevieve County, Missouri

Submitted by: Justin Anderson, VSL

Owner: Holcim Ltd.

Engineer(s): Consultec Ltd, Toronto

Contractor: MC Industrial

P/T Supplier: VSL



Overview:

Consisting of two clinker silos and two cement “four-pack” silos, the cement plant for Holcim Inc., currently under construction in St. Genevieve, Missouri, will be the largest of its kind in the world once it is completed in 2008. The clinker silos, measuring 151 feet in diameter and 207 feet tall, will also be the largest in the world. Each of the four-pack silos is composed of a cluster of four 79-foot-diameter, 275-foot-tall silos. Given the massive nature of the project, a post-tensioned design helped considerably in reducing the amount of mild reinforcement used. This, in turn, aided in the labor-intensive slip-form construction process commonly used for tall structures such as silos. Because the post-tensioning strands were installed, stressed and grouted after the slip-form process, they remained off the critical path of the slip. Pilasters measuring the full height of the silo provided access to the ends of the ducts, allowing installation, grouting and stressing operations to be performed on swing stages outside the silo. Crews worked around the clock to slip all four silos in the four-pack simultaneously, and logistics were carefully coordinated to ensure that all materials were on-site before the start of the time-sensitive construction process. In the end, 5.7 million feet (or 2,110 tons) of post-tensioning strands were used, but because post-tensioning is approximately four times the strength of mild reinforcing steel, the total steel area and congestion were reduced. Post-tensioning also helps control cracks and improves shear capacity within the concrete silos, since the active reinforcement provides residual compression during all loading conditions.