Arcosa used lightweight aggregate to provide the necessary internal moisture across two bridge spans, each approximately 270-feet in length.

LADOTD USES ICC FOR U.S. 80 BRIDGE OVER KANSAS CITY SOUTHERN RAILROAD

When the Louisiana Department of Transportation & Development (LADOTD) needed to construct a bridge on U.S. 80 over the Kansas City Southern railroad tracks to accommodate two lanes of northbound and southbound traffic, it decided to incorporate internally cured concrete (ICC) into its completion plan.

A concrete mixture in which some of the fine aggregate is replaced with similar sized pre-wetted lightweight aggregate (LWA), ICC provides hydrating concrete adequate moisture from within the mixture to replace water lost due to chemical shrinkage. Used on bridge decks with good success, ICC is known for its strength and reduced shrinkage and cracking.

Wanting to leverage these advantages on its new bridge, the LADOTD implemented a demonstration project to prove the value of internal curing in a real-life setting. According to Arcosa Lightweight's Director of Technical Sales Jeff Speck, the company used lightweight aggregate to provide the necessary internal moisture to complete the ICC process across two of the total five bridge spans.

The first span incorporated 300 pounds of pre-soaked lightweight fine aggregate per cubic yard of concrete. The second comprised about 150 pounds of the aggregate per cubic yard of concrete. "We used two different approaches to show that even if you don't provide quite as much internal curing moisture as intended, the process still offers high value," says Speck.

TWO DECKS IN PLACE
ADA, LA
With the two decks in place, Speck says LADOTD will continue to monitor each span's performance compared to the three that didn't incorporate ICC. This is all being completed as part of a research project on internal curing that's being conducted by the Louisiana Transportation Research Center (LTRC). So far, the lightweight aggregate and accompanying ICC process are proving to be valuable additions to LADOTD's ongoing bridge work.

"Compared to the materials that we normally use, the internal curing provided by the lightweight fine aggregate substantially increased the concrete compressive strength. It was a real eye opener," says Ken Viers, Quality Control Manager for Builders Supply Company.

Viers says the company implemented the mix design that was used during the ICC process. After switching up its plant and processes to be able to accommodate the new material, Builders Supply Co., got to work. The rest of the job went smoothly and produced positive results.