The product used in this geotechnical application is manufactured at ARCOSA's Livingston, Alabama plant and delivered by multiple trucks to the jobsite about two hours north of the plant.

LWA PROTECTS CONCRETE DRAINAGE SYSTEM ALONG NEW INTERSTATE

Designers of Corridor X, a major interchange built just north of Birmingham, Alabama, had an engineering challenge. New traffic lanes needed to go over the top of an existing concrete drainage system.

The problem? The volume of fill material needed to build the area up to grade was enough to cause concerns about cracking the culvert.

"The box culvert ends up being pretty deep and it required a significant amount of fill material to get it back up to grade," says Jeff Speck, Director of Technical Sales for Arcosa Lightweight. "If you filled with ordinary soil and normal weight fill material those loads would be high enough to cause concerns about over-stressing and cracking the box culvert."

That's where Riverlite®, a lightweight aggregate manufactured by Arcosa Lightweight, provided a solution. Contractors filled three excavated areas with over 15,000 cubic yards of Riverlite®. "To reduce the weight as much as possible, they placed the product dry," says Speck. "Because it was confined by the sides of the trench, they were able to get compaction without adding water."

Protecting a concrete pipe or culvert from being damaged is a new application for the product, Soeck explains.

"This is only the second project of this type where we've supplied Riverlite® for fill over the top of a pipe that's buried deep beneath the highway. It's a great application for lightweight aggregate because it reduces the load on that pipe or box culvert by more than half compared to normal weight material."

"The reason Riverlite® is so good in that application is its very low density, and a very high angle of internal friction. Because you have a very low density and a very high friction angle, the pressure is greatly reduced."

MADE IN LIVINGSTON, AL

"Riverlite® is the lightest expanded lightweight aggregate produced in the United States. It's not because we're so special, it's because the raw material is special. When we mine our clay, we bring it into a shed to control the moisture. We process it by heating it to about 2000°F in a rotary kiln. After it cools, it's no longer clay. It's a ceramic hard inert aggregate. It's structural and it's very tough. After the material cools, we crush and screen and grade it to the customer specifications."

After two weeks of placement, the culvert was once again deep underground. Today, traffic travels over the area and drivers are never aware of the issue designers had to solve to make the new lanes possible.

“This project is yet another example of how lightweight aggregate provides a solution for a unique engineering challenge. The properties of Riverlite® are so much different from ordinary fill materials that it allows engineers to come up with solutions to solve some real tough challenges,” says Speck.

Dry placement of lightweight aggregate solved the technical problems of protecting an existing culvert under traffic lanes and also keeps transportation costs down.