Ground broke in November 2021 on the construction of the NewDay USA Center for Leadership at GMC, an $11 million auditorium-style building with classroom space.

CASE STUDY:

GEORGIA MILITARY COLLEGE

The stage and orchestra pit area of a new performing arts center on the campus of Georgia Military College (GMC) in Milledgeville was built using concrete made with Arcosa Lightweight's structural coarse aggregate. The aggregate is an expanded clay material produced at Arcosa's Livingston, AL plant.

Inside the nearly 30,000-square-foot, single story, steel-framed building is a theater that seats more than 800. Designed for live performances, the theater houses an elevated stage and a lower pit area comprised of metal decking and approximately 17 yards of lightweight concrete.

"The architect specified a semi-lightweight concrete with a plastic density of 120 pounds per cubic foot," says Alan Deariso, vice president of sales and technical service at the Milledgeville-based Fowler-Flemister Concrete, Inc., the ready-mix producer for the stage and pit project.
Deariso says while the amount of concrete required for the arts center was relatively low, the material plays an important role in the project. "In terms of constructing a suspended slab, the steel framing must be able to support the weight of the slab plus the live load, which in this case includes performers, props and other stage needs."

This was the first time Fowler-Flemister has used Arcosa's lightweight coarse aggregate. "In the past, we used a different lightweight aggregate that was not as light as the Arcosa product," he said.

The mix design for the project included Arcosa's structural coarse aggregate, which is heated in a kiln to about 2,000 degrees F and then graded to meet the ASTM C330 3/8" by #8 grading specification. The aggregate is then pretreated with sufficient water to achieve a saturated surface dry (SSD) condition. Strictly speaking, the material is not completely saturated, but the permeable voids inside the aggregate particles are filled with water, necessary to make the concrete pumpable.

CASE STUDY: STRUCTURAL LIGHTWEIGHT CONCRETE

PERFORMING ARTS CENTER, GA

ARCOSA LIGHTWEIGHT

Milledgeville, GA-based Fowler-Flemister Concrete, Inc., was the ready-mix producer for the stage and pit project.

The day before the pour, prewetted material was delivered late afternoon to Fowler-Flemister's ready mix plant. This was done to minimize drying of the aggregate prior to batching concrete. To allow for adjustments to the mix design and ensure the correct aggregate volume was included, the loose density was noted upon arrival. The next morning, the concrete was batched, a minor slump adjustment was made, and the final product was delivered to the site.

At the job site, the concrete was tested for slump, density and air content, and compressive strength test cylinders were made before the concrete was released to the contractor to pour. The concrete pumped smoothly without issues with a 5-inch slump and a density of 121 pounds per cubic foot at the time of placement. The project was completed in four hours.

Just-in-Time Inventory

Arcosa's lightweight structural coarse aggregate was delivered to Fowler-Flemister using the Just-in-Time (JIT) Inventory method. This means the aggregate was delivered already presoaked with water, alleviating the time and extra expense for Fowler-Flemister to prepare the aggregate before batching concrete.

"It's extremely important for lightweight aggregate to be properly saturated," says Paul Altznauer, technical sales representative for Arcosa Lightweight. "Aggregate that is not delivered in a pre-wet state will take time to properly prepare as is the stockpile is watered, soaked and turned to get sufficient water into the aggregate. But with the Just-in-Time method, the aggregate can be used the day it is delivered."

Altznauer says because the material has already been properly saturated ahead of time, the ready mix producer can make concrete that arrives with less slump loss. This inventory method also provides cost savings to the ready-mix producer as it cuts down on labor needed to water and turn the stockpile. and reduces the need for water, storage, sprinkler systems, hassles with cleanup, runoff and other associated costs.

"We eliminated that timeframe, that labor. The soaking process was already taken care of by us," Altznauer said. "We do the work for you. It's a simple process that can make a big difference in the ready mix plant and on a job site."