The installation used 1,000 cubic yards of Arcosa Lightweight expanded shale aggregate.

LIGHTWEIGHT CONTROLS SETTLEMENT ON HEAVILY TRAVELLED BRIDGE

Years after Arcosa Lightweight expanded shale aggregate was installed on the west end embankment of the US 67 bridge over State Highway 174, the quiet performance of the product allows the heavy traffic on the bridge to roll on without incident.

The Fort Worth District had struggled for many years with settlement problems on both ends of the bridge, which is highly traveled by large trucks going from rock and sand quarries in Southwest Johnson County into the Dallas-Fort Worth area. It is also a major truck route from the Dallas-Fort Worth area to south and west areas of Texas.

TxDOT decided to install the lightweight expanded shale aggregate on the west end embankment and a geofoam block system on the east end. Settlement sensors were installed on the geo-foam block side of the embankment. Richard Willammee Jr., P.E., Materials Engineer with the Ft. Worth District of the Texas Department of Transportation (TxDOT) explains, "We were looking at both lightweight systems to see if we could lessen or eliminate the incidence of vertical settlement."

How is it holding up, years later? According to Willammee, "We don't see any settlement or cracking of the pavement at that end of the bridge.. We're still very satisfied with it." According to Ed Bell Construction Company, the general contractor, the installation of the expanded shale was simple and fast. The geofoam block system was more expensive and more labor intensive because of the need to cut and stack each block to fit the embankment area. Willammee noted that the fact that very little heavy equipment was needed for the geo-foam block installation should also be considered when comparing costs.

Willammee said that the District would definitely consider using lightweight aggregate as fill material again in situations where settling was a concern.

"If we're trying to construct an earth embankment that we know may give us some problems due to its excessive height or its location, then we would seriously consider using the lightweight aggregate", Willammee said.

Marshy areas, or areas where the soil is highly expansive -- where TxDOT might wish to keep the weight on the base soil to a minimum -- would be good candidates for using the lightweight aggregate fill, he added.

"What we have tried to do is get material in with a lower plasticity index -- or material that is less susceptible to swelling and shrinking depending on moisture content."