

# **ENR** Texas & Louisiana

## **Best Manufacturing: Triumph Aerostructures - Vought Aircraft Division Manufacturing Facility**



Triumph's front entrance features a sign and flag poles with up-lighting and numerous shrubs and grassed area.

Photo by Sandy Krupa Photography



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**KBR Building Group** led construction on a \$23.9-million manufacturing facility for Triumph Aerostructures' Vought Aircraft Division in Red Oak, Texas. This specialized facility comprises 240,000 sq ft of manufacturing space with 17,000 sq ft of attached office area.

This design-build project pursued an aggressive schedule. Although the facility was built to manufacture a unique new aircraft wing, the wing itself was still being designed and engineered while the building was under construction. This meant there were some unknowns about placement of equipment foundations, process-equipment utilities and other owner-related equipment that had to be accommodated throughout construction. The contractor therefore worked with Triumph to coordinate installation of equipment before the concrete slab was completed in the remainder of the building.

The facility's exterior walls consist of 14-ft, tilt-up concrete panels with insulated metal, extending to an eaves elevation of 45 ft. Two-ton and five-ton cranes serve most of the manufacturing floor area, each with bridges spanning the 100-ft bays and hook heights of 32 ft. In many locations throughout the facility, specialized tools and equipment must be supplied with compressed air, along with equipment-specific power and data needs.

The geotechnical makeup of the site was heavy, highly active clay soils, so to ensure the structure was sufficiently supported to prevent movement from expansion, the project team designed column foundations to rest on 24-in. and 30-in. drilled piers socketed 5 ft into the dense limestone. Pier caps, grade beams and other sensitive concrete items that came into contact with the clay soils were protected from expansion through the use of paper-void forms.

To mitigate expansion and contraction of the clay soils, the contractor excavated native soil to the depth of limestone or a minimum of 10 ft. After removal, the soils were returned to the building pad and conditioned with water, then capped off with 2 to 3 ft of mined limestone. Once conditioned clays reached 3 ft under sub-grade elevation, 3 ft of compacted crushed limestone was applied to seal in the moisture.

Based on the soils report, the project team designed the site so that no materials would have to be either imported or exported. Enough limestone was available in the bottom of the retention pond to be mined to provide the cap for the moisture-conditioned clays. With tremendous efforts from the rippers on D-10 dozers, the team saved the owner more than \$500,000.

A formal groundbreaking was held in late December 2011. Working on a fast-track schedule, the project was completed in September 2012.

### **Key Players**

**Owner** Triumph Aerostructures, Mansfield, Texas

**General Contractor** KBR Building Group LLC, Greenville, S.C.

**Lead Design** BRPH Architects, Engineers, Constructors, Melbourne, Fla.

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