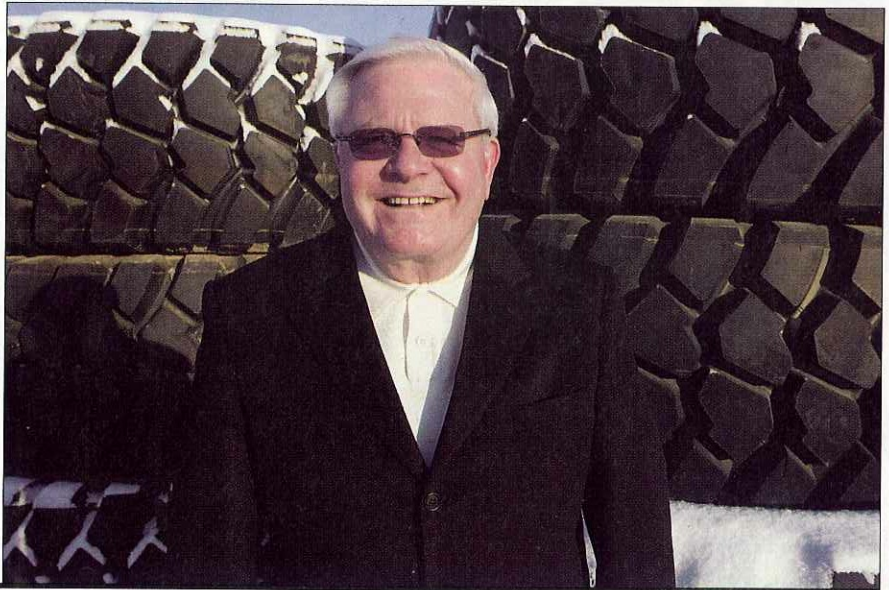


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34 Dwayne McAninch, chairman and CEO of McAninch Corp., is a Midwestern contractor with global ideas. His Iowa-based company invested millions of dollars in electronic earthmoving controls and became the “missionary” for the revolutionary technology.

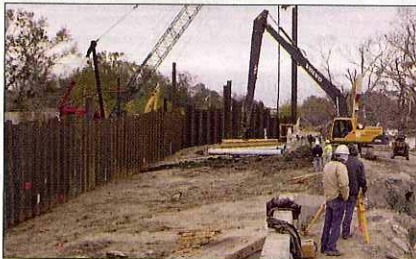
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BRIDGES

Redesigned Transit Crossing Features Intricate Steel Work



A triangular steel-truss bridge over Tempe Town Lake, Ariz., that required six months of customized steel fabrication and welding is now nearing completion. The 1,531-ft-long, 11-span structure is a key link in Valley Metro Rail Inc.'s new \$1.3-billion, 20-mile light-rail line connecting central Phoenix and Mesa.

The Denver office of PCL Civil Constructors Inc. began construction in 2005 under a \$21.75-million contract. The work is on budget and scheduled to finish Aug. 28. The bridge consists of 42 trusses, each weighing between 50,000 and 80,000 lb and set 15 ft above the water. It's supported by 10 8-ft-dia drilled-shaft piers and two abutments. Each truss, ranging from 100 ft to 160 ft long, contains two



▲ **Weld Done.** Phoenix steel truss light-rail crossing required complex pipe cutting and welding for 722 unique pieces of diagonal bracing that demanded tight tolerances.

sections that were bolted together onshore and hoisted into place with two floating barge cranes. Trusses were temporarily cantilevered up to 40 ft from pier caps until the next section was erected, says Shayne Waldron, PCL construction manager.

Fabrication of the bridge's 880 pieces

of diagonal bracing—722 of which are unique—required a \$250,000 one-of-a-kind computerized thermal cutting system, says Gary Gardner, quality control manager for Stinger Welding Inc., Coolidge, Ariz., the steel truss fabricator. "AutoCad couldn't handle it," he says.

"We had to create a special 3-D program due to the complexity of the design."

The diagonal beveled braces consisted of 10-in. pipe, up to 10 ft long, with wall interiors up to 1½-in. thick. Specifications required pipe lengths to be accurate within ⅛ in. Up to 4,000 full-penetration welds will help prevent premature fatigue during Arizona's hot summer, when steel expands and contracts.

Valley Metro, the nonprofit public owner, was 20% into design of a modified cable-stay bridge, then switched to the low-profile redesign by T.Y. Lin International, San Francisco, after the state Historic Preservation Office expressed concerns about impact to a historic 1912 railroad steel truss 50 ft away, says Joel G. Mona, Valley Metro resident engineer.

The south abutment was redesigned to a spread footing instead of drilled shafts for fear that the crane-mounted drill rig would hit overhead power lines. A 72-in.-dia pipeline buried under the bridge supplies 60% of downtown Phoenix's water. It entailed excavation and concrete reinforcement to withstand the additional bridge load.

The Central Phoenix/East Valley light-rail project is about 33% complete, with \$850-million worth of work under contract, says Valley Metro CEO Rick Simonetta. The at-grade double-track system is slated to start service in 2008. ■

By Tony Illia in Tempe, Ariz.

