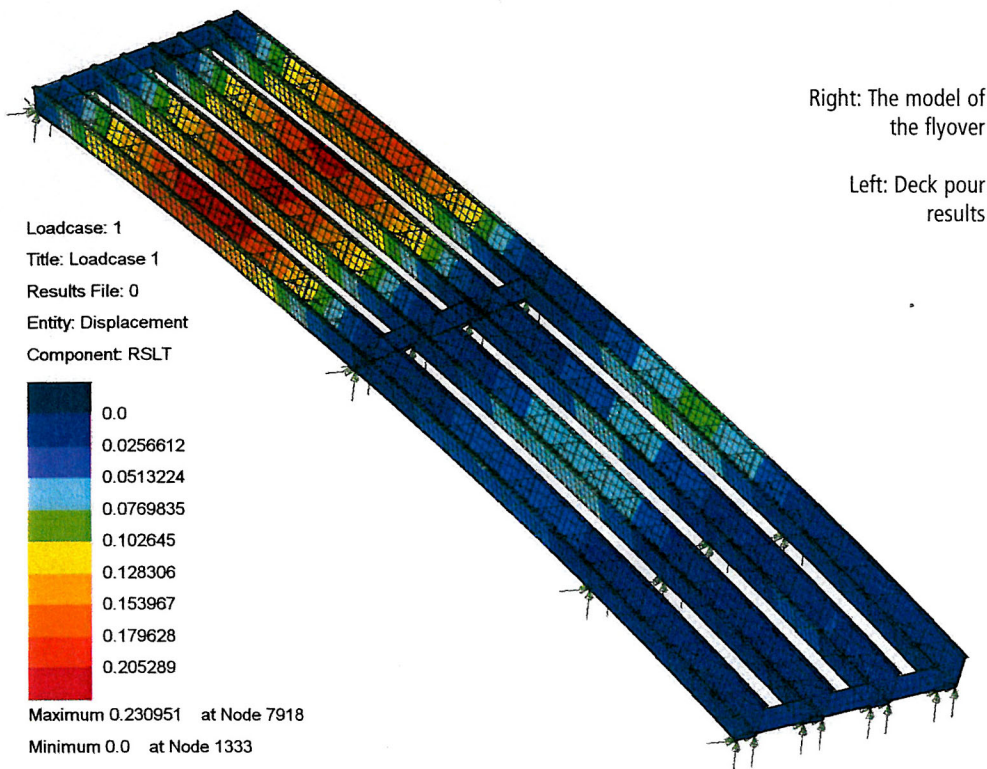


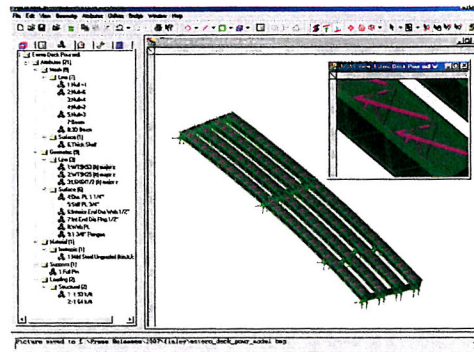
# STEEL SAVINGS

A flyover in the USA was redesigned to save money



Right: The model of the flyover

Left: Deck pour results



lateral thick shell elements modelled the four box girders and stiffeners in the bridge structure. Customised displays of assigned geometric attributes such as steel plate sizes were produced by visualising each thickness in turn - especially useful for checking that the correct thickness assignments were made. This in conjunction with the Lusas groups facility, which permits easy definition and isolation of each sub-element of the model for display and model building purposes, and the fleshing facility, which helps ensure the correct orientation of standard section sizes is obtained, helped Finley to build the model in a very straightforward manner. Pinned supports including the temporary supports beneath the longest span were assigned to the model and a linear static analysis was carried out. From the Lusas analysis overall girder displacements and stresses in the bracing struts and girder plates were obtained for the applied loading.

Craig Finley, president of Finley says: "We see this as a great example of what can happen with value engineering when the owner, contractor and engineer come together to create a design that takes the contractor's strengths into account and that uses the best material and the most appropriate software for the challenges of the project." He adds: "In this case, the redesign from concrete to steel had an overall positive effect on the cost, schedule, and efficiency of the bridge, and the use of Lusas helped us meet our design deadline and to prove an alternative bridge design that will ultimately save the client a great deal of money in construction costs."

This view is echoed by Lee County public works operations manager Donald Deberry. "We are obviously pleased," he says. "We always appreciate working with engineers and contractors who are willing to take a second look at projects and find ways to give the public better value for money." ■

The deck pour model is shown

A recent project to complete an engineering redesign of the Estero Parkway Flyover in Florida was carried out using Lusas Bridge software. Consultant Finley Engineering Group redesigned the bridge, which is in Fort Myers, for the contractor ZEP Construction.

Finley's four-steel box girder design produced significant savings in construction costs over the cast-in-place concrete box girder design which was originally proposed. As the result, some US\$1.85 million will be passed to the project owner, Lee County in Florida, as a value-engineering credit.

The Estero Parkway Flyover is 171m long, with spans of 104m and 67m and is approximately 35m wide. It will extend Estero Parkway over Interstate 75, connecting with Ben Hill Griffin Parkway, which then meets with Corkscrew Road to the south east of the city.

Finley's redesign replaces the proposed twin, cast-in-place concrete box girders with a single, four steel box girder design. This solution provides significant savings by eliminating a large falsework support system, reducing construction time, reducing the foundation design requirements and simplifying construction. By using shallower steel girders, shallower approach grades can be used, saving fill and construction time. It also

means that the contractor can erect the bridge in longer sections, creating fewer obstructions in the roadway.

The new design uses a staged temporary tower support scheme to optimise the efficiency of the steel section, which makes the steel bridge solution more attractive against a cast-in-place concrete one. The redesign also enhances overall project safety with the elimination of the falsework system over the interstate and reduces the risks associated with a constrained traffic pattern through the falsework system.

Each curved steel box girder consists of webs of 25mm-thick plate and top and bottom flange thicknesses of 32mm plate. Internal cross-bracing formed of WT and L sections is used in conjunction with diagonal top flange bracing of WT sections to stiffen the girders. At supports, 32mm-thick internal diaphragms with access holes are used with end diaphragms of 12.5mm-

thick web, and flange plates connect adjacent girders.

In all, 15,000 quadri-

