

Cross Seminole Trail
2008

S is for Striking

Trail users cross US 17-92 in style

By Tonia Johnson



The Cross Seminole Trail winds 19.3 miles through some of the most beautiful undeveloped land in Seminole County, Florida.

Every month about 10,000 outdoor enthusiasts follow the paved recreational trail through old growth forests and pristine wetlands vibrant with animal and plant life, including Big Tree Park's "The Senator," a towering 129-foot cypress estimated to be 3,500 years old.

By sheer seniority, The Senator seems entitled to the attention county planners show it and its neighborhood. In Seminole County, public improvement projects are designed with keen awareness for the natural setting, and the new US 17-92 pedestrian overpass at General Hutchison Parkway near Sanford is a recent positive example.

"Everyone here is very impressed with it," said Skip Groeneveld, Seminole County project implementation coordinator. "The bridge blends in well, and people like the way it wraps around and winds through the woods. It's pretty cool!"

Completed by the design-build team of Ayres Associates and American Bridge in May 2008, the \$5 million overpass allows pedestrians and bicyclists to continue uninterrupted along the Cross Seminole Trail as it passes over US 17-92 near the General Hutchison Parkway intersection.

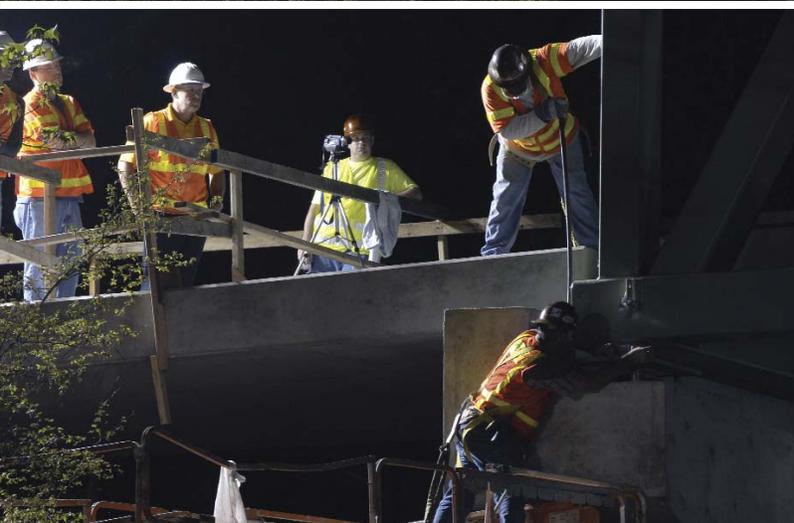
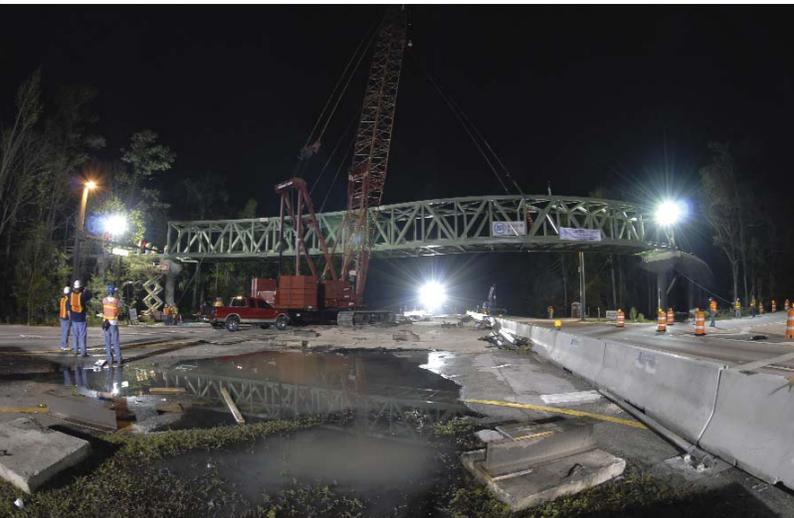
One crucial component for the structure was that it blend in with its natural setting. The look of the finished structure reflects thoughtful planning during the project's early stages.

"Seminole County wanted special attention paid to aesthetics," said Hisham Sunna, project manager and engineer of record in Ayres Associates' Tampa, Florida, office. "When you look at the bridge, it's obvious that this is not a run of the mill structure."

The bridge's earth-tone color palette is composed of muted greens, browns, and grays that recede into the landscape. The two main-span concrete support columns are artistically painted to look like tree trunks, mimicking the oaks, maples, and pines that stand nearby.

Specially selected Trex entryways greet pedestrians on east and west ends of the bridge. Trex is a wood and plastic composite material that resembles traditional decking but resists weather damage and requires less maintenance by the County.

"Reverse curved" steel trusses support the deck and result in a gently curving, 206-foot,



S-shaped bridge that is a natural continuation of the trail. According to Sunna, this type of bridge design is extremely rare, possibly unique in this country.

“It’s striking; it’s daring,” he said. “When you look around, there won’t be any other that looks similar.” Sunna said internal quality control was extremely important due to the engineering complexity of the curved design, as well as the constraints of working within a design-build context that does not readily allow changes. To make certain that the design was correct before construction began, Ayres Associates scrutinized it through an independent peer review.

The analysis and design, conducted by Ayres Associates’ Tampa bridge design group, used 3-dimensional computer modeling to evaluate the effects of various loadings and vibration on each truss member. A second analysis, conducted by the company’s Eau Claire, Wisconsin, bridge design group, re-evaluated the same factors using a different 3-D computer modeling program, ultimately confirming that there were no design errors that might derail the project.

“There were quite a few emails and phone calls getting everyone to a comfort level with this bridge analysis,” said Dan Sydow, an Ayres Associates structural engineer and member of the Eau Claire peer review team. “But that’s the really nice thing about having multiple bridge design groups in our company. We can review each other’s designs from a totally original perspective.”

The County’s choice of a design-build delivery method allowed the contractor and the consultant to work more closely together than with a more traditional project delivery method. Ivan Gualtero, lead designer for Ayres Associates, worked alongside American Bridge throughout the construction phase to make any modifications that were needed on the spot, including making several visits to the fabrication plant where the truss pieces of the bridge were being built.

“We were all there – American Bridge, Ayres Associates, and Seminole County – to make sure that the bridge was being built according to the plans,” Gualtero said. “If there were any issues, we could resolve them quickly.”

In the spring of 2008, truss pieces were bolted together by American Bridge on-site within the US 17-92 median. Disruption to traffic lasted just a little more than a month. Once assembled, the entire S-shaped truss was lifted by a 300-ton crawler crane, rotated to the correct

Overnight construction crews were on site to lift the main truss into place. Nighttime placement of the bridge minimized road closure disruptions for local travelers. The truss was assembled in the highway median and then lifted and bolted into place.





alignment, and set into place in a single night.

“It fit like a glove,” said American Bridge project manager Allen Dronko, adding that all the bolts lined up within a half-inch of where they were supposed to be, well within factored tolerance. “It shows that when you start with a streamlined design without difficult details, and work together to resolve design and constructability issues, the project will run smoothly and get done on time.”

Ayres Associates and American Bridge completed the project three months ahead of schedule and within Seminole County’s budget despite an unexpected mid-project alteration by the Florida Department of Transportation (FDOT) that required them to raise the bridge by several feet.

Dronko recalls working with Ayres Associates to minimize the impact of the FDOT change on the bridge project. The bridge needed a higher clearance over US 17-92, which required raising the main columns and modifying the approaches. “We were able to keep proceeding on time by figuring out what parts of the design definitely had to change and altering the construction sequence to keep moving,” Dronko said. “It all worked out.”

The entire project lies within an environmentally sensitive area. Best management practices were used to protect the wetlands and limit impact to the trees. The approaches to the overpass were also curved and were aligned with the goal of minimizing tree removal. At the conclusion of construction, all disturbed areas were replanted with native vegetation.

Southeast Construction magazine recently selected the project as a winner of its “Best of 2008” program, bestowing on it the highest award in the category of best engineering.

“Ayres Associates and American Bridge stepped up to the plate every time,” said Seminole County construction project coordinator Al Collock. “They did their job, and we’re getting a lot of positive feedback on it. People here enjoy the trail, the greenery, and crossing over this structure.” ■

Left: Aesthetic features like the paint colors and native Florida plantings around the bridge help the structure maintain the natural character of the recreational trail. The bridge supports were painted to mimic the look of nearby trees. Right: The Cross Seminole Trail is designated a Showcase Trail by Seminole County, and a portion of the trail is part of the Florida National Scenic Trail.

