

Detailing the Cyber

BY HAL CARTEE, P.E.
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Prevot Design Services / Cyber Innovation Center

SEVERAL YEARS AGO the community leaders of Bossier City, La., and Bossier Parish, near Shreveport, La., set about to conscientiously foster an environment focused on creating high paying job opportunities for a growing population. The national security of our cyber infrastructure would be the cornerstone of their efforts and the Cyber Innovation Center would be the lure to bring their goals to fruition and provide attractive employment opportunities.

“The Cyber Innovation Center is an economic development initiative designed to create a knowledge-based workforce and provide an environment for diversification of the region’s economic base” said Craig Spohn, executive director and president of the Cyber Innovation Center. “With the Global Strike Force locating to the Barksdale Air Force Base [in Bossier City], the role of the CIC in technical support of future Department of Defense initiatives looks promising.”

For architects Prevot Design Services in association with Mike McSwain Architect, the main architectural challenge for the project was to remain nimble in pursuit of tenants. While the type of tenant desired was known, considerable flexibility was required to

meet space and security needs. “The specifications for the building had to be able to meet the needs of tenants with the highest level requirements,” said Mark Prevot, president of Prevot Design Services. Because it incorporates a “force protection” design, the building had to be fitted with blast force barriers that were incorporated into the structure and surrounding landscape. “The five Spoke Towers on the north face of the building were part of the blast force design function,” Prevot said, “but ultimately became symbolic with the intent of the building, representing the talons of an eagle and suggesting a position of strength.”

George Wallace, president of Wylie Steel Fabricators, Inc., Springfield, Tenn., credits the assembled team for the success of the project. “The project originally came in over budget,” Wallace said. “But through the efforts of the architect, the structural engineer, the general contractor and our staff, an extensive number of value engineering ideas were considered to bring the project into budget.”

Shortly after being awarded the Cyber Innovation Center project, Wylie Steel brought Florence, S.C.-based Cartee-Berry

Innovation

Combining high security requirements with a high-tech look required communicating all the details.

Center



A Prize-Winning Venture

One side benefit of taking on challenging projects is that you occasionally receive recognition. Cartee-Berry & Associates was named the 2009 SDS/2 Solid Steel Competition Grand Prize Winner (Commercial) for the Cyber Innovation Center project. The competition recognized innovative, challenging projects detailed using SDS/2.

"Since we began the company in 2001, we've dedicated ourselves to excellence and innovation, and this award recognizes the hard work of everyone on the team," said Hal Cartee. "We've been a long-time user of SDS/2 software and have attended the user's group conference for eight years. To return this year as a grand prize winner was a big deal for all of us."

"We also are very fortunate to be surrounded with the outstanding group that we have," said Rudy Berry. "We are also thankful for the support and dedication of the Design Data team. Their SDS/2 software sets the standard in steel detailing and has been a foundation for the success of our company."

The Cyber Innovation Center in northern Louisiana incorporates a "force protection" design whereby the spoke towers provide facility security as well as making an architectural statement.

& Associates on board as the steel detailing firm. This was our first project with Wylie Steel and it did not take long to realize that it was going to be a good fit. It was clear that Wallace and the rest of the people at Wylie were committed to going above and beyond what was necessary to ensure that their customers—the contractor and the erector—would be completely satisfied with their efforts.

Stand Out Features

"Although the building itself is unique in many ways," Wallace said, "the spoke towers were the feature that made this project special." He says that for the estimators, the material takeoff for the sloping skewed trapezoidal laced towers was a time-

consuming endeavor, requiring tedious analysis of the complicated geometry.

For the shop, making sure the fabricated assemblies would fit the anchor bolt pattern in the field was essential. To accom-

plish that, a jig was created to replicate the anchor bolt setting pattern for the spoke towers. This pattern had to match the dog-leg column bases, adding an additional element of complexity to the skewed lean-

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Wylie Steel Fabricators Inc.

Left: The fabricator assembled and tested each of the five unique towers in the shop before preparing them for shipment, ensuring that the steel erector would have little difficulty in the field.

was the early participation of all the parties involved in resolving constructability issues early on. Through several phone conversations, we learned how Wylie wanted the spoke towers fabricated and we worked hard to carry that out.

Process Details

The first time we reviewed the contract drawings for the Cyber Innovation Center, we realized that this was not going to be an ordinary project. Featuring the five skewed spoke towers, the rolled roof, the leaning glass window wall framing, the large opening for the aircraft statue in the middle of the massive cantilever section—all made this project unique in many aspects.

We modeled the first spoke tower using Design Data's SDS/2 software, then sent a 3D model for approval prior to executing the detailing of the initial tower. With the 3D model in hand, the architect, the structural engineer, the general contractor and the steel fabricator were able to see exactly what the final product would look like.

ing towers. The fabricator assembled and tested each of the five unique towers in the shop before preparing them for shipment, ensuring that the steel erector would have little difficulty in the field.

The steel for the project amounted to approximately 1,235 tons, but that was only part of the story. "While the tonnage for the five spoke towers was less than 10% of the total project, the shop man hours were closer to 50%," Wallace said. That matched closely with our steel detailing hours as well.

That there were hardly any fit up prob-

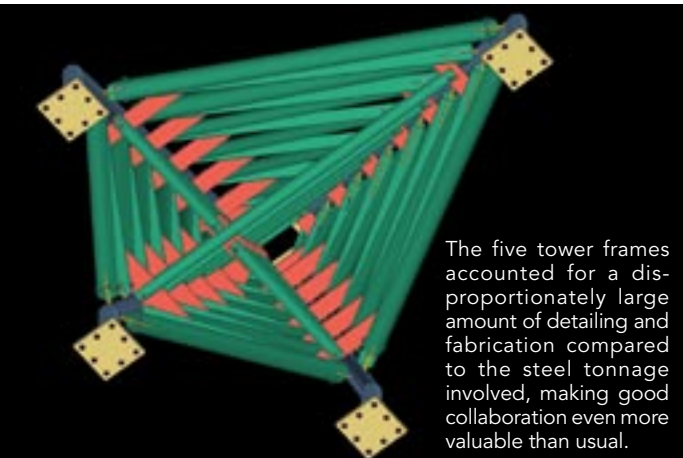
lems on this project can be attributed to excellent detailing combined with the skilled craftsmanship of the people in the fabrication shop. "At Wylie we enjoy a challenge," Wallace said. "While we are capable of performing well on the everyday beam-and-column jobs, and we certainly appreciate those, we are known for the more difficult and challenging projects. Our people are very good at what they do and that gives us an advantage in competing for projects that others shy away from."

A key aspect to the success of this project



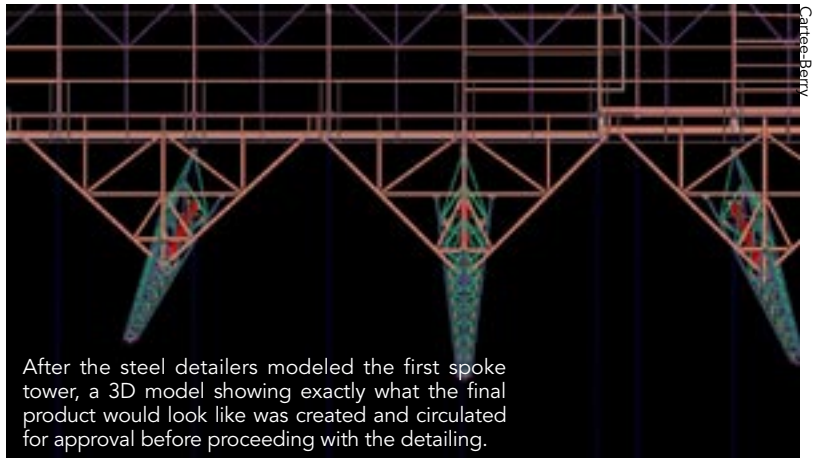
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Right: In addition to the five skewed spoke towers and rolled roof, the steel framing is made even more complex by a large opening in the massive cantilever section for an aircraft statue.



Cartee-Berry

The five tower frames accounted for a disproportionately large amount of detailing and fabrication compared to the steel tonnage involved, making good collaboration even more valuable than usual.



Cartee-Berry

After the steel detailers modeled the first spoke tower, a 3D model showing exactly what the final product would look like was created and circulated for approval before proceeding with the detailing.

Getting sign off on the approach we had developed through discussions with the fabricator allowed steel detailing to proceed with confidence. We knew only minimal changes would be necessary when drawings were returned from approval.

Communicating the Concept

This was also the first project we have been involved in where a “YouTube” video was created to give a virtual tour of the architects rendering. Throughout the CIC project, that video served as a motivational tool for all of our associates and kept them excited about the project at hand. It also provided our associates an opportunity to show the video to their friends and family, who seldom get to see a visualization of the outstanding projects they participate in.

Prior to Cartee-Berry coming on board, the fabricator and the contractor had presented many value engineering ideas to the design team for review. Most of those ideas were accepted and ultimately became part of the contract documents. Many phone meetings followed as Wylie Steel brought the Cartee-Berry team up to date on the value engineering efforts as well. It was during those conversations that the foundation for a strong detailing-fabrication team was developed.

After our first conversation, it was apparent why Wylie Steel has a reputation as the “go to” guy for specialized and difficult projects. Their knowledge and experience along with their “can do” attitude created a perfect partner to work with on a unique project like the Cyber Innovation Center. MSC

Owner

National Cyber Research Park

Architect

Prevot Design Services in association with Mike McSwain Architect, Shreveport, La.

Structural Engineer

Morphy Makofsky Inc., New Orleans (AISC Member)

General Contractor

McInnis Brothers Construction, Minden, La.

Steel Erector

Constructors & Erectors, Inc., Gladewater, Texas (SEAA Member)

Steel Fabricator

Wylie Steel Fabricators, Inc., Springfield, Tenn. (AISC Member)

Steel Detailer

Cartee-Berry & Associates, LLC, Florence, S.C. (AISC Member)

Software

SDS/2