



# News Release

## UNITED STATES AIR FORCE

**437th AIRLIFT WING PUBLIC AFFAIRS OFFICE**  
102 East Hill Blvd., Rm. 223, Charleston AFB, S.C. 29404-5154  
Phone: (843) 963-5608, 5588 or 5589 Fax (843) 963-5604

**PAO email:** edmund.memi@charleston.af.mil  
After duty hours, call the base operator or  
command post (963-2531) & ask for a PA rep

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### CHARLESTON TEAM BUILDS BRIDGE, WINS CONTEST

**CHARLESTON AIR FORCE BASE, S.C.**—Many bridge experts have come out of the woodwork amidst recent talk about the Cooper River bridges in Charleston. It turns out, Charleston AFB base has its own award-winning experts on bridge design.

A team from the 437th Maintenance Squadron here took first place in a national contest for building a 12-ounce structure that holds 2,616 pounds.

The contest was held in conjunction with the recent Society for the Advancement of Material and Process Engineering Symposium in Long Beach, Calif.

Team members responsible for building the super-lightweight composite bridge included Master Sgt. Paul Childers, production superintendent; John Young, aircraft structural supervisor; and Randy Clayton, aircraft structural repair technician.

"We developed our bridge design based on what we have seen work well in aircraft structures, and applied pure gut-level observation as practiced day in and day out during our aircraft composites maintenance task," Childers said.

The team constructed three bridges for competition in two categories: Professional Division 1 and Professional Division 2.

In the PD1 category, the winning bridge was constructed from a list of kitted materials. Some items were substituted with like items, which were approved by society judges.

"We can use additional material than what was sent to us, but it has to be the same type of material," Childers said.

The items with which the bridge was constructed included plain weave carbon cloth, Nomax honeycomb core (rated at four pounds per square inch), miscellaneous paste adhesives and laminating resins, Childers said.

The team was also given specifications for the design of the structure.

"They give you a blueprint of the base it sits on and the dimensions it has to fit," Clayton said. This year's specification allowed for a structure with a maximum diameter of 22 inches and a maximum height of six inches.

Even though there is no weight limit, the structures are judged on a strength-to-weight ratio, Young said.

"This means the best structure should be very light but very strong," he said.

In the PD2 category, the team took second and third place with their designs.

"The difference between the categories is in PD1, they give you the material you can use, but in PD2 there are no limits in the materials that can be used in the construction of the bridge structure," Childers said.

For their P2 bridges the team used five-harness carbon cloth and heat curable resin systems. The PD2 structure taking second place was a 12-ply thick, solid-laminate structure, weighing 22 ounces and holding 8,894 pounds. The third-place structure was a four-ply-thick honeycomb structure, weighing 16.12 ounces and held 5,186 pounds, Childers said.

The team started brainstorming and working on the bridges in January, Young said. They spent about two and a half weeks, four to five hours a night after work, designing and constructing the structures.

The team competed against engineers and designers employed by Boeing and the National Aeronautics and Space Administration, as well as other nationally well-known companies.

This is the third time the fabrication flight has placed in the competition and the second time it took first in the PD1 category.

The team brought home two composite fishing rods as prizes, but Young said, "The glory is not in the prize. This competition really helps us. Any time you take something to the edge, you see things you wouldn't see in typical repair. By taking the materials we work with every day and pushing them to their limits, we learn more about our job."

"The contest is really just a side item to the symposium," Young said. "The meeting gives us the opportunity to stay up to date on current technology in the composites field."