

Ties Magazine (September 2001) brought you an article describing the West Point Bicentennial Engineering Design Contest as it was being introduced to the world. We are proud to say that hits on the contest web site doubled the week that issue of *Ties* reached our readers. That translates to 1200 hits and over 500 downloads of the Bridge Designer software per day. Here is what happened, who won and what to look for in the future.

by Cathy Bale

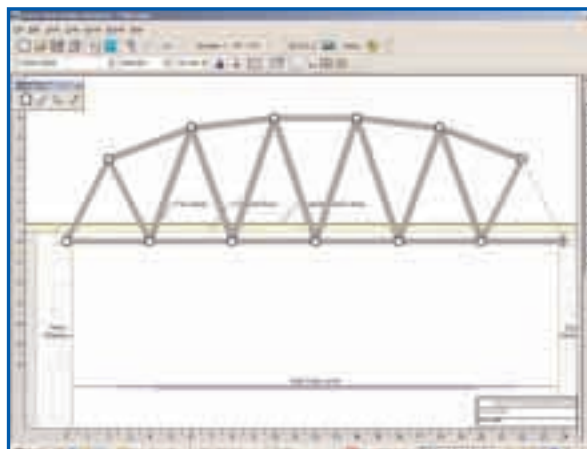
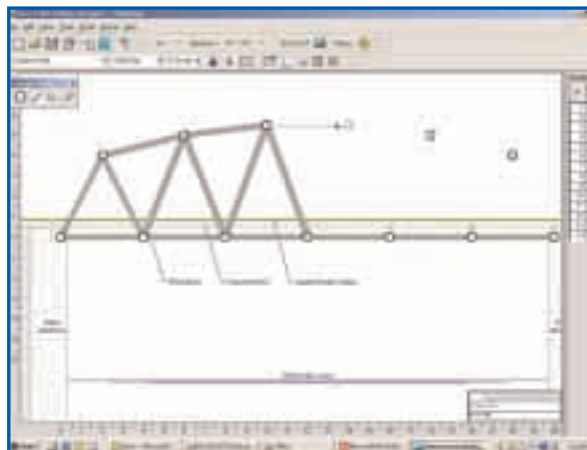
<And the winner is... Everyone>



“It was all that I imagined and hoped — 21 gun salute, 4 ‘atta boys,’ and my deepest thanks.” Dr. Dan Turner, past President of the American Society of Civil Engineers summed up the mood after the West Point Bicentennial Engineering Design Contest Final Round weekend. In fact, the contest and Final Round event were such an overwhelming success that the board of the American Society of Civil Engineers has already pledged a sizable gift to fund a Bridge Design contest for next year. ASCE was the primary sponsor of the contest and was very pleased with the outcome. Reflecting on the event, Colonel (retired) Thomas Lenox, the coordinator for ASCE’s participation in the event, had this to say. “Thinking about the events of the last several years brings to mind one of my favorite quotations, ‘A teacher affects eternity; he can never tell where his influence stops.’ Henry Brooks Adams. I have similar thoughts about the WPBEDC—we probably will never know the extent of its considerable influence.”

TAKING A LOOK BACK

It all began when the qualifying round of the contest officially began on November 11, 2001. The cutting edge, Internet-based, bridge design event attracted more than 19,000 teams, which translates into more than 38,000 students in grades kindergarten through grade 12. The event also attracted media attention with articles appearing in *USA TODAY*, *PARADE*, *ties Magazine* and many local papers. Ingenious students from across the nation and around the world spent three months creating virtual bridges using a computer-aided design software package called the West Point Bridge Designer. United States Military Academy professor Colonel Stephen Ressler created the award winning software specifically for the contest. The software challenges students to design bridges using a realistic set of design specifications and test them for structural adequacy while minimizing their cost. COL Ressler put years of thought and hard work into creating the West Point Bridge Designer Software. “The software was designed to use the power of simulation to not only motivate students toward the further study of engineering but to also provide a realistic, engaging, hands-on civil engineering design experience that demonstrates how engineers design real structures.” Dave Izzo, a teacher



The software challenges students to design bridges using a realistic set of design specifications and test them for structural adequacy while minimizing their cost.

“The West Point Bridge Designer is... as entertaining as a game.”

The Great Hall was a perfect site for the finals. The contestants could see the scoreboard, but not each other's computer screens. Spectators could see everything from the balcony.

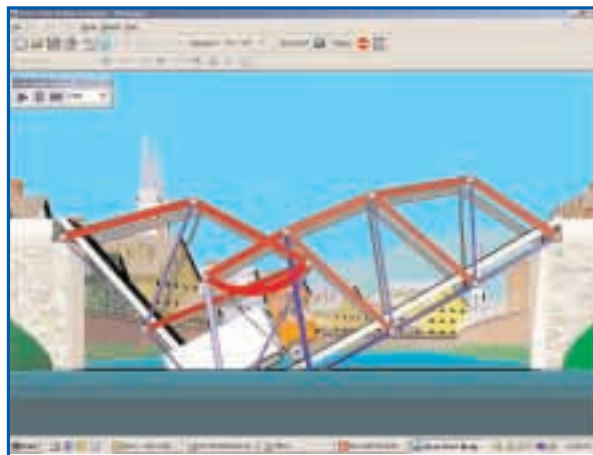
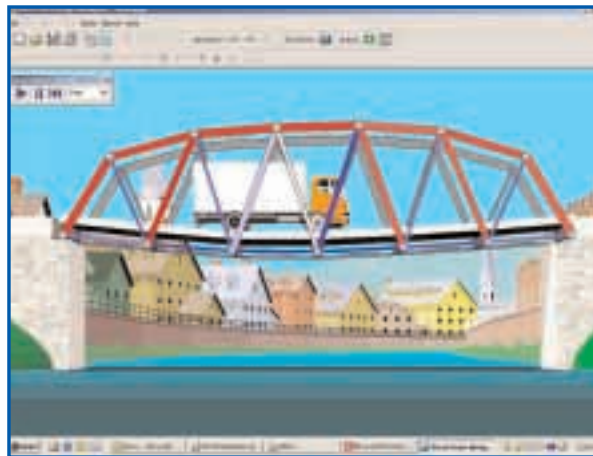


from the Department of Defense School in Ramstein, Germany, said the software and contest really engaged his students. “I have a hard time keeping students off the software. It is a high-interest activity that the students obviously enjoy. During lunch it is not uncommon to have students in the room designing bridges. As an overall activity it gave us a great way to blend a fun problem-solving activity with learning a logical design process.” One of Izzo’s students, Justin Mackey of team MACMAN, was ultimately invited to compete in the Final Round. Randal Pope of Hot Springs, Arkansas, another final round contestant, says the Designer is actually addictive. “The West Point Bridge Designer is a tremendous tool because it captivates the user by being as ...entertaining as a game. It then teaches things like how stress acts, what shapes and materials best deal with different stresses, how to compromise aspects of a design in order to minimize cost and how to think out of the box.”

THE FIRST TWO ROUNDS

The Qualifying and Semi-final Rounds of the event were conducted entirely over the Internet, using the software and a high technology web site designed by Colonel Eugene Ressler (Steve’s brother). The site was designed so it was capable of testing the bridge to make sure it carried the truckload successfully, recording the bridge cost and immediately informing the team about where their submission stood in the contest. All this happened fast enough so the site could manage several million teams submitting many bridges per second. During both Internet phases of the contest the site performed perfectly and was only down for scheduled maintenance.

The Semi-Final Round of the contest occurred on Founder’s Day, March 16, 2002. The top seventy teams from the four regional contest zones of the United States were invited to participate in the high stakes event. Competing students worked at locations of their own choosing but were required to arrange for a contest monitor to verify their original work. Contestants were provided a new design project and then had three hours to create a second design for judging. Designs were submitted to the contest website via the Internet for judging. Again, success was determined by the stability of the structure and cost of the design. The top designers

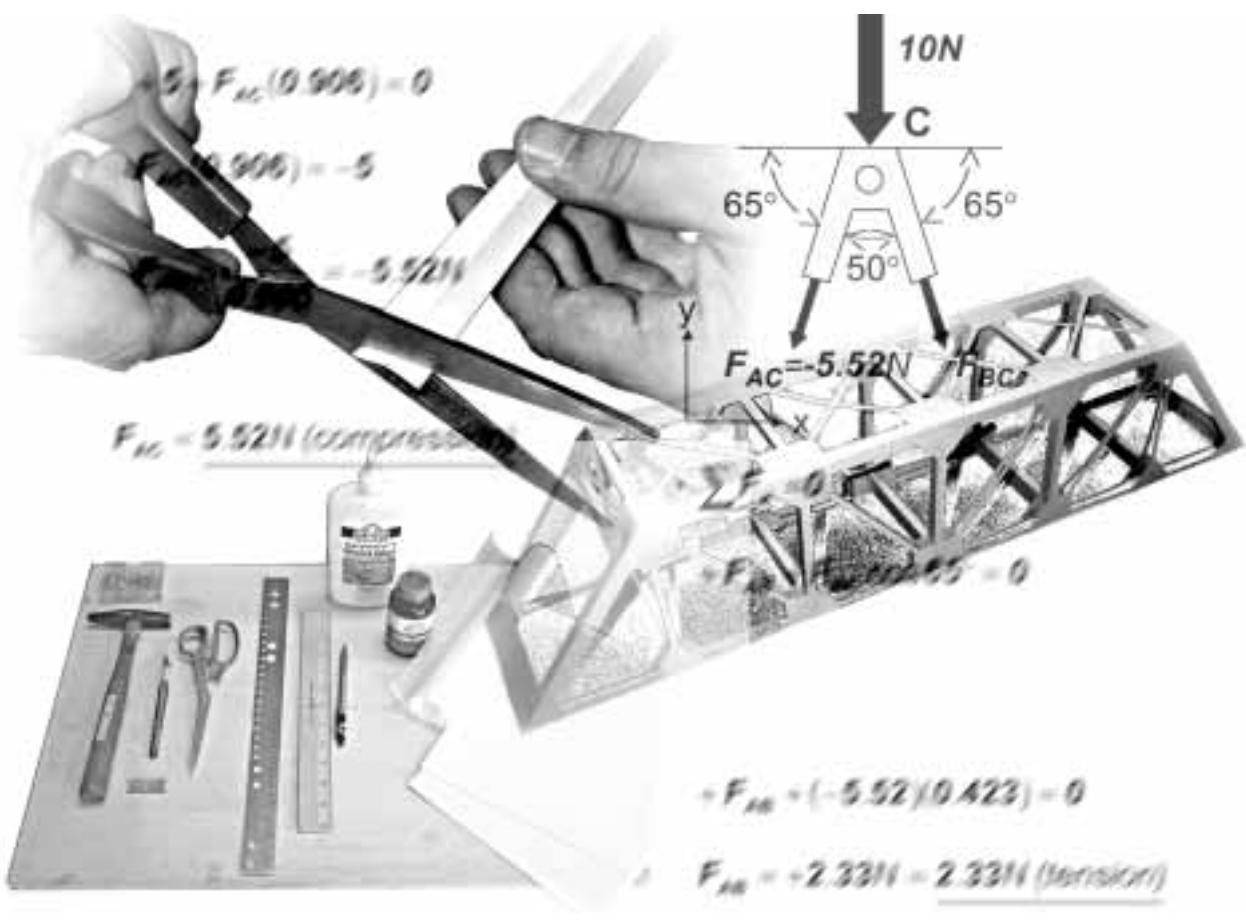


Contestants were provided a new design project and then had three hours to create a second design for judging.

“I knew we had a good design.”



Colonel Ressler created low-cost, hands-on bridge building activities. For details go to the contest web site <http://bridgecontest.usma.edu/manual.htm>.



from each zone who created the lowest costing, structurally accurate bridges were invited to participate in the Final Round.

Mark Kasdorf, a team member of one successful team called The ASSEMBLY, from Chittenango, New York, said he had good feelings about making it to the Final Round. "I knew we had a good design. Even though we didn't know how everyone else had done I felt like we had a good shot at being invited to the Final Round." Mark was correct. They made the cut and he and his teammate, Nathan Durfee, became hometown heroes. News of their accomplishments made the front page of The Post Standard newspaper. Much of the credit for the team's participation in the event goes to their teacher, Elizabeth Carpenter, a 1987 graduate of the Academy. "I read about the contest in ASSEMBLY magazine." Carpenter was in the Army Corps of Engineers and now teaches Advanced Placement Physics at Chittenango High School.

MAKING THE CUT

In addition to team ASSEMBLY, six other teams consisting of 13 students from across the United States and Ramstein, Germany, were invited to the United States Military Academy on the weekend of April 26, 2002, to compete in the Final Round of the WPBEDC.

Contestants were accompanied to West Point by their parents, family members and their sponsoring teacher. The contestants and their families had a chance to size up the competition and try to relax at a reception on Friday evening. After a long flight from Ramstein, Germany, Justin Mackey, of team MACMAN, said he was a bit tired but excited to compete. "I am glad to be here and I hope I do well." Each member of the first place team received a \$15,000 cash scholarship, the second place team members each received \$10,000 cash scholarships and the third place team members left with \$5,000 cash scholarships.

THE DAY OF THE FINAL ROUND

After a breakfast at the Hotel Thayer, an overview of the afternoon's contest and a tour of West Point,



Team OCTOPI, Daniel Clawitter (left) and Randal Pope (right) refine their design during the final round.

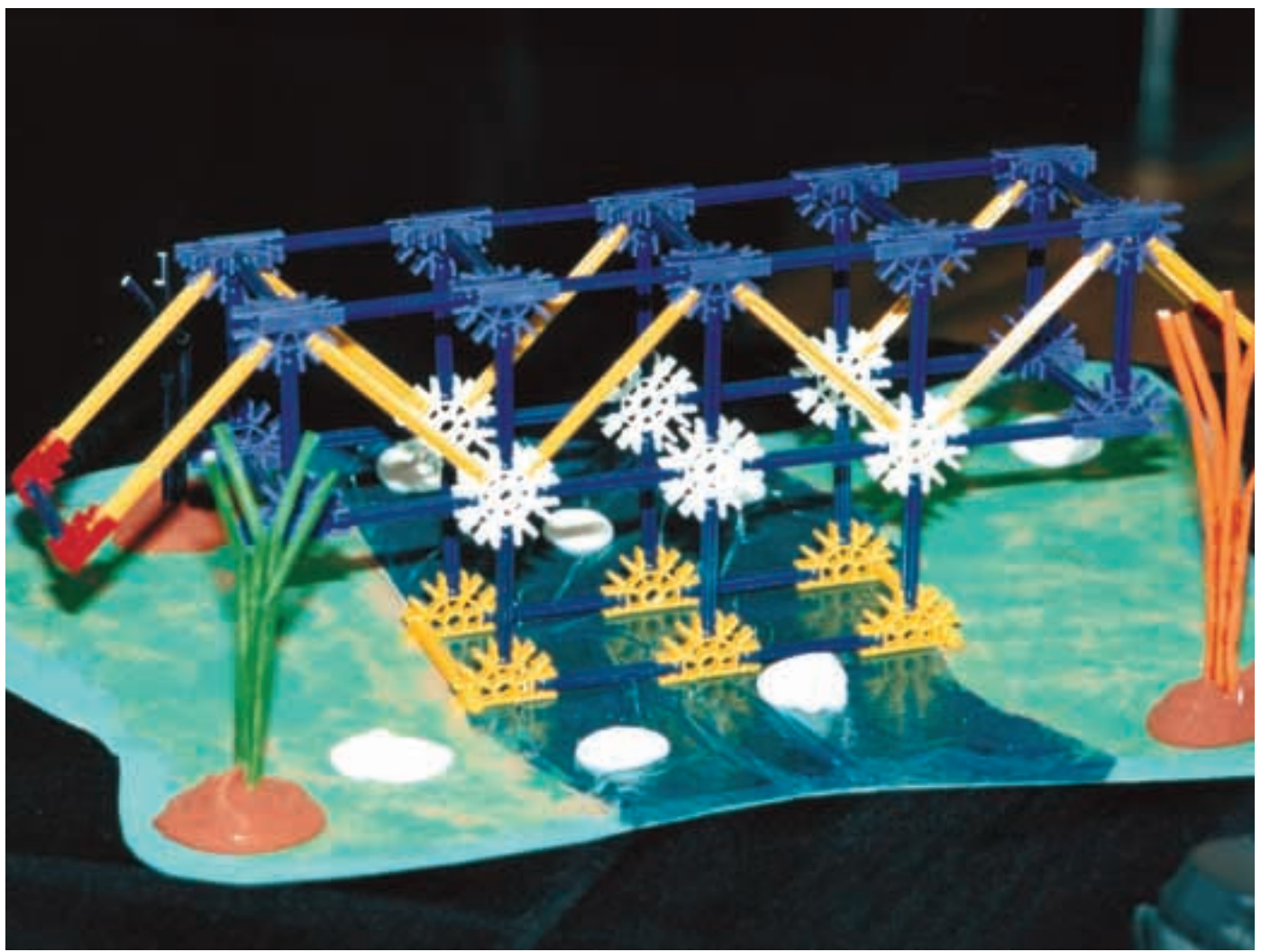


The CNH HOCKEY team of Mike Barca (left) and Alexander Scheinker calmly discuss their plan.

“It was very exciting and rewarding for all participants.”



Local students from Cornwall High School made the K'NEX bridge centerpieces for the awards banquet.



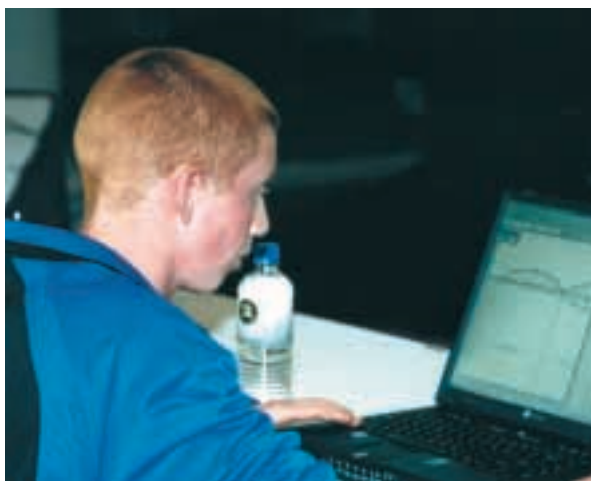
the contestants met at Herbert Hall for the big event. The Final Round was designed to resemble a sporting event and was staged in the Great Hall in front of the fireplace. COL Ressler was intrigued by how exciting the Final Round event was to watch. "Anyone who doesn't believe that bridge design can be a spectator sport should have been at Herbert Hall on Saturday!" All seven teams were arranged in a semi-circle around a projection scoreboard. Dividers separated each team so they could not see each other's designs as they worked. However, they could all see the contest scoreboard. During this round they had the added tension of knowing exactly how they stacked up with the other competing teams. Additionally, spectators were able to observe the event and the actual designs the teams were creating. With the help of computer LCD monitors stationed outside the arena, the gallery could watch a team build their bridge piece by piece. Spectators could also observe their favorite team from the balcony or from behind the teams in the observation areas of the arena. Once the contest began so did the excitement and tension. Parents and teachers gasped and let out little cheers as their kids dropped or climbed the leader board. In fact, the last eight minutes of the contest proved to be a real nail-biter when the second place team made a run for first. Izzo said the event was actually thrilling to watch. "From start to finish the whole process was outstanding! The room that the competition was held in was perfect. The atmosphere of a sporting event was certainly reached with the dramatic changes in placing as the competition was nearing the end. It was very exciting and rewarding for all participants."

AND THE WINNER IS...

Team OCTOPI, the zone two champions, Daniel Clawitter and Randal Pope of the Arkansas School for Math and Science in Hot Springs, Arkansas, were victorious with a final design costing \$7,989.43. Pope says when they went into the final round he was intimidated by teams The ASSEMBLY and CHN HOCKEY. "I did not want to feel over confident. We did not at all expect to



Team WHATSFALLINGDOWN members Bharat Reddy and Leslie Anne Nicholson used a combination of the computer and pencil and paper to keep track of their design.



A competitor pauses before finalizing his plan.

FIRST PLACE TEAM

DESIGN COST \$ 7989.43

Daniel T. Clawitter and Randal S. Pope
Arkansas School for Math and Science
Hot Springs, Arkansas

SECOND PLACE TEAM

DESIGN COST \$8018.15

Alex Scheinker and Mike Barca
Clarkstown North High School
New City, New York

THIRD PLACE TEAM

DESIGN COST \$8041.42

Leslie Anne Nicholson and Bharat Reddy
Tuscaloosa Academy
Tuscaloosa, Alabama
Teacher Sponsor: Tammi Scheiring

FINALIST TEAM ZONE 3

DESIGN COST \$8109.66

Justin L. Mackey
Ramstein High School
Ramstein, Germany
Teacher Sponsor: Dave Izzo

FINALIST TEAM

DESIGN COST \$8380.59

Wildcard Teams
Mark C. Kasdorf and Nathan J. Durfee
Chittenango High School
Chittenango, New York
Teacher Sponsor: Elizabeth Carpenter
USMA class of 87'

FINALIST TEAM ZONE 4

DESIGN COST \$8542.50

Matt A. Stagg and Nick A. Treneff
Crater High School
Central Point, Oregon
Teacher Sponsor: Douglas Gardner

FINALIST TEAM ZONE 1

DESIGN COST \$8592.13

Rob J. Cuccio and Chris Malloy
Newtown High School
Sandy Hook, Connecticut
Teacher Sponsor: Jay Daly



do as well as we did. We were, however, excited about the prospect of us each walking away with a new laptop, and of course, we had some hope that we might place third or better and get some scholarship money.” Building things is in the blood of these two contestants. They have impressive plans. “Most of our plans for the future involve building stuff. We have been working on breaking the world record for the largest Rube Goldberg Machine and plan on finishing that up this summer along with doing some more cardboard boat designing, building and racing. I plan on going to MIT and majoring in Mechanical Engineering. Daniel will be going to the University of Arkansas where he will also be studying mechanical Engineering.”

The second place prize went to team CHN Hockey consisting of Alexander Scheinker and Mike Barca of Clarkstown North High School in New City, New York. CHN HOCKEY held the lead in the final round until the last eight minutes of the contest. Still, the team finished second with an impressive design cost of \$8,018.15. Scheinker will attend RPI next year and plans to study engineering. He says he thoroughly enjoyed the weekend’s events. “I think the contest was very well organized, it was a very enjoyable event and it gave me an appreciation for West Point which I did not previously have.” Both team members are hockey players.

Team WHATSFALLINGDOWN placed third in the event. The team of Leslie Anne Nicholson and Bharat Reddy attend the Tuscaloosa Academy and are from Tuscaloosa, Alabama. They took third place with a bridge costing \$8,041.42. Reddy says he found the final round quite challenging because of the shorter time restrictions, but he also added, “It was a great weekend. I’ll remember... [it] for the rest of my life.” Reddy plans to study biology at Vanderbilt. Nicholson also enjoyed the weekend and was very pleased to take third place. She plans to attend the University of Alabama in the fall and will study Engineering.

THE AWARDS BANQUET

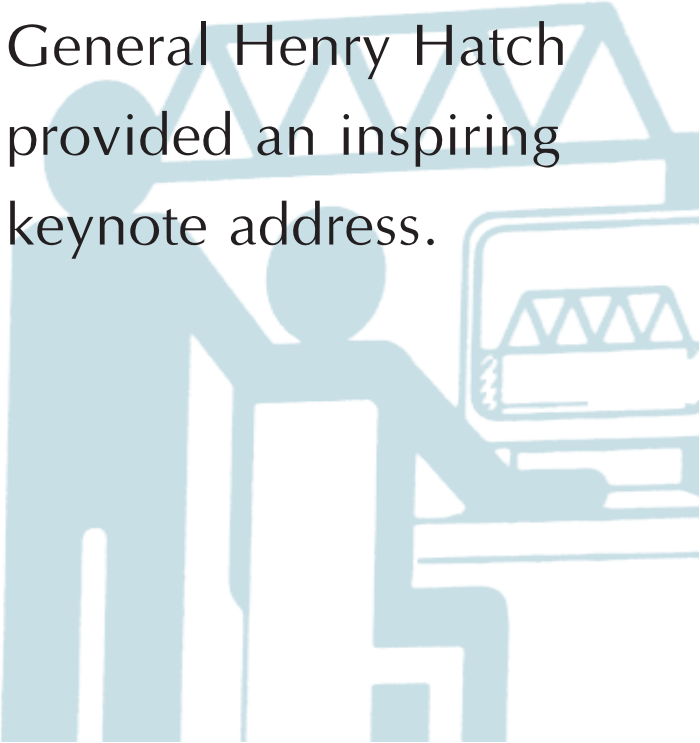
The Final Round was followed by an awards banquet at the Eisenhower Hall Ballroom.



Finalists gather for awards dinner high above the Hudson River.

Each team received a crystal award etched with the Bicentennial seal, the contest logo and the ASCE 150th anniversary celebration seal.

After a wonderful dinner, Lieutenant General Henry Hatch provided an inspiring keynote address.



The contest creator, Colonel Steve Ressler, congratulated the contestants at the awards banquet.



West Point Superintendent, Lieutenant General William Lennox, gave his thanks for a job well done to the finalists and to Colonel Ressler and his staff.



Parents and chaperones gathered for conversation and refreshments prior to the banquet.



Lieutenant General Lennox, West Point's Commandant, provided opening remarks, congratulated the competing teams on their accomplishments and thanked the many people who made the contest possible. After a wonderful dinner, Lieutenant General Henry Hatch provided an inspiring keynote address. In 1992, Henry J. (Hank) Hatch completed a distinguished 35-year career in the United States Army. He was the Chief of Engineers, the Commander of the U.S. Army Corps of Engineers and graduated from USMA in 1957. Later in the evening, COL Ressler, Maria Lehman, the ASCE Vice President of Zone 1, and Cathy Bale, the Coordinator of the WPBEDC, presented the trophies to the winning teams. Each team received a crystal award etched with the Bicentennial seal, the contest logo and the ASCE 150th anniversary celebration seal.

Randal Pope, of the winning team OCTOPI, was also very impressed by the entire experience. "As far as I know the final round went off without a hitch. This was no doubt due to the apparently very thorough planning that went into the event. I imagine there was also a tremendous amount of behind the scenes work going on during the weekend. We all had a great time while we were in New York, and Daniel and I really do appreciate the years of hard work that went into making this contest a reality. It would be great if the contest could be held again in the future."

Well, Randal is going to get his wish. COL Steve Ressler and his crew are examining this year's contest and will host the design contest again next year. Visit *Ties* Magazine web site in September 2002 for the details. The Open Round will kick-off on January 4, 2003 and end April 5, 2003. ●



American Society of Civil Engineers (ASCE) President, Lieutenant General (US Army, Retired) Henry Hatch gave the keynote address at the banquet.



Bill Raiford, Chairman of the West Point Bicentennial Steering Group, presented ASCE representative Maria Lehman with a plaque thanking ASCE for their support.

Cathy Bale

is the Public Relations
Coordinator for the engineering
design contest.