



# Significant Figures

*...getting civilized with SCE alumni.*

American Society of Civil Engineers (ASCE) Student Chapter

CALIFORNIA POLYTECHNIC STATE UNIVERSITY, SAN LUIS OBISPO

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Editor: Danielle Steinmetz, [danielle.m.steinmetz@gmail.com](mailto:danielle.m.steinmetz@gmail.com)

## 2011 Robert Ridgway Award Winners

This marks the third year in a row that Cal Poly has been awarded this honor. The student chapter has been hard at work to keep this tradition of providing value for it's members.

## STUDENT, FACULTY, AND ALUMNI BBQ

The 2011 Student, Faculty, and Alumni BBQ was a huge success thanks to everyone that came out to enjoy a beautiful day in the sun with delicious food, good conversation, and an intense softball game. Alumni Relations officer Chad Inlow did a great job organizing the event, and it went off without a hitch.

Although they put up a good fight, and got a few scrapes and bruises along the way, the students couldn't outdo their experienced opponents. With a final score of a lot to a little, the Faculty/Alumni team extended their winning streak to two years.



*Hopefully next year the student team can take back the title!*

## SAN FRANCISCO - OAKLAND BAY BRIDGE TOUR



As the 2010-2011 school year drew to a close, SCE was given the opportunity to send 24 members up to Northern California to tour the Bay Bridge. After arriving in Oakland, members had lunch in Marina Park with a beautiful view of the bridge. At the project site, the group was taken on a boat tour of the all-new east span of the bridge including the skyway, the Yerba Buena Island Transition Structure, and the longest Self-Anchored Suspension (SAS) Span in the world.

Students learned many interesting facts about the bridge and the construction process. After the tour, a presentation was given about how the SAS Span system works and how the materials were transported to the site and constructed.



# Seismic Design Team

In February 2011, Cal Poly's Seismic Design team took second out of 28 teams from across the globe in EERI's (Earthquake Engineering Research Institute) undergraduate competition in San Diego, CA.

The team included both civil and architectural engineering students who collaborated to build a five foot balsa wood building. Points were awarded for "rentable" floor area as well as aesthetics, presentation, and prediction of performance. The buildings were tested through three different earthquakes and had to withstand all three to stay competitive, as major points were deducted for seismic damage.

Cal Poly's building, named Diadem II, withstood the first two earthquakes flawlessly. On the third quake, however, the accelerometer on the roof broke loose after a column unexpectedly snapped by the forces. The accelerometer proceeded to fall through the center of the building causing a little damage. Hopes were not high for a top finish, but the building performed so well in all other respects that Cal Poly's team was still able to take home the second place prize.



The team was led by project manager, Jeannie Tran, along with four other captains. Next year the team hopes to improve upon their finish at the competition in Memphis, Tennessee.

# MSE Wall Team



The 2011 team with their final product. From left: Clayton Proto, Kira Ortiz, Taki Chrysovergis, and Brent Goligoski.

Cal Poly San Luis Obispo was one of sixteen schools selected to participate in the 6th annual Geo Challenge at Geo Frontiers 2011 in Dallas, Texas. These four person teams were selected based on a three page design paper detailing the design process and construction procedures.

In this competition, each team constructed, in timed stages, a scaled down Mechanically Stabilized Earth (MSE) Wall in a 3-sided plywood box filled with sand. The fourth side is the wall, where a poster board holds back the sand with strips of kraft paper running into the backfill as reinforcement. The kraft paper utilizes frictional and passive resistance with the sand to hold the poster board in place. The team using the least reinforcing mass while keeping the wall stable under vertical and lateral pile loading was declared the winner.

The Cal Poly San Luis Obispo team took second place in the nation in its first appearance on the national level. Following the national competition, the team earned first place at the Pacific Southwest Regional Conference.



# STEEL BRIDGE

## *Steel Bridge Team is the Best from the West*



The 2011 Steel Bridge Team with Advisor Dr. Kasper. From left: Ryan Enneking, Lucas Hoffmann, Jeff Stallman, and Riley Jones

With the primary goals of precision and control, the team utilized the school shops for the first time to fabricate the entire bridge in house. The team learned how to use the CNC machines and utilized them to manufacture innovative slip twisting connections and other connections with tolerances to the thousandth of an inch.

After taking first place at Regionals, the team earned an invitation to the 25th Annual AISC/ASCE National Steel Bridge Competition, hosted by Texas A&M at College Station from May 20 to 21. The team arrived in Texas on Wednesday and practiced construction in the hotel parking lot. On Friday, 48 highly engineered bridges set up for display. After a few practice runs in the morning, the team entered the arena and dazzled the judges with the connections and put down a blazing 7.27 minute run after a 15-second penalty for a dropped bolt. Next, the Cal Poly team completed the lateral pull test, with only  $\frac{1}{4}$ " maximum deflection on the cantilever. The team then finished the vertical load test with an aggregate deflection of .546".

This year's Cal Poly Steel Bridge team put in thousands of hours to showcase a highly innovative, low-cost, structurally sound bridge. This year's team knew that precision and control would be needed during fabrication to facilitate and improve the overall quality of the bridge to perform well among the top teams at the National Competition.

The team was surprised this year to learn that the judges had made three drastic changes to the rules. A 5 ft cantilevered section was now required on one end, the number of required bolts was increased and the weight of the lateral pull was increased by 25 lbs while the allowed lateral deflection was decreased to a  $\frac{1}{2}$ ". Based on these rule changes, the team designed and constructed a 21 ft long, 3 ft wide and tall bridge that weighed 167 lbs and could be constructed in just over 6 minutes with 4 builders.



The team finished 5th in Construction Speed, 4th in Lightness, 8th in Display, 16th in Deflection, 7th in Economy, 5th in Efficiency. This resulted in a final cost of \$2,635,472 and an overall 6th place finish. Cal Poly has been steadily rising in the national rankings since 2009, placing 33rd, 12th, and now 6th. This finish marks the best finish for Cal Poly since 1999, where the team finished 3rd at Nationals. With first place this year just half a million dollars away, next year's team is eager to hit the ground running and bring back a 1st place trophy.



# CONCRETE CANOE

## Concrete Canoe Team earns 1st place at National Competition

After attending last year's National competition, the concrete canoe team knew that they had some big shoes to fill, so they made it their goal to build a canoe of the caliber that could earn Cal Poly a second national championship. All of the hard work put forth by the captains, paddlers, faculty, and student members of SCE has paid off and the team couldn't be more proud.

This year's oceanic-themed canoe, *CETACEA* (right), weighed in at 208 lbs. Over 5,500 person hours were spent in testing, construction, analysis, and paddling. This year, to meet a new sustainable aggregate requirement, the team decided to use crushed porcelain from used toilets! Porcelain enabled them to meet their aesthetic goal of having a white canoe, it had ideal material properties, and it gave everyone something to joke about all year. Other new innovations and aesthetic features are the pneumatic mold-release system, curved bulkhead, cast-in-place tiles to mimic that curvature, and intricate three-dimensional elements.



The 24th Annual ASCE National Concrete Canoe Competition took place in Evansville, Indiana from June 16-18. Cal Poly had one of the longest trips, but 40 people made it to Indiana to support the team. The competition was stiff this year, as there were some amazing canoes on display Thursday. On Friday, the team gave their technical presentation and answered questions from the panel of judges.

Saturday was race day, and teams awoke to a brilliant thunderstorm. After a five hour delay out at the lake, races began. The team raced the canoe in the co-ed sprint, women's sprint, and men's sprint. The weather stayed clear, so the coordinators set up a modified endurance course using the sprint buoys for the slalom. Cal Poly took 2nd place in every race except the men's sprint, where they took 4th.

The individual awards for the 2011 team include 4th place in the Design Report category, 2nd place in the Oral Presentation, and 2nd place overall in the races. The team also placed 1st in Final Product for the third consecutive year. This also marks the sixth year in a row that Cal Poly has placed in the top 5 at the National Competition. The team is truly honored to have been awarded first place overall and they are excited to see what next year's team has in store.



The 2011 Team, from left: Jason Armes, Jazz Gilbert, Dustin Lee, Dr. Fiegel, Aaron Fortier (Captain), Emilio Rossi (Captain), Chad Inlow (Captain), Erik Biczkow (Captain), Dr. Hall, Danielle Steinmetz (Captain), Alicia Welling, Kea Jolicoeur, Renee Morales (Captain).



# ALUMNI INTERVIEW *with* STEVE STRICKLAND

This quarter we are happy to introduce you to alumnus Steve Strickland (BSCE 1990). Steve had varied technical interests while in school. Choosing not to specialize in one particular area, he completed advanced courses in hydraulics and hydrology, structures, and geotechnics. Steve remembers the courses with labs and hands-on learning as being the most enjoyable. Dr. DeNatale was his favorite professor because, as Steve recalls, "he was an excellent instructor inside the classroom, and he was very energetic and involved with the students outside the classroom."

The many fun aspects of the Society of Civil Engineers (SCE) are what drew Steve to the chapter, and he attended the conference that was held at Arizona State University. That year, he helped build and paddle the concrete canoe, as well as collaborate on a design paper related to wastewater treatment. One thing that Steve noted about the conference was the heat. He remembered that it was well over 100 degrees every day. He also recalled that he and several other members were tasked with riding in the back of the U-Haul truck with the canoe from the hotel to the school. "It was like being in a pitch black sauna that rocked back and forth." Steve thought that the Arizona State conference was definitely the most standout time for him with SCE.

Steve reminisces that college is a very special time in a person's life. The first time he stepped foot on the Cal Poly campus was the day he moved into Trinity dorm, and he appreciated the new freedom and personal responsibility that came with that. If he had to pick three things that he misses most about college, it would be living with your friends, the freedom of your time, and San Luis Obispo. "I know many students will see "freedom of time" and laugh because, when you're a student, you have classes, studying, tests, papers, etc. It doesn't feel very "free," but you will soon see that being done with classes at 2:00pm on Thursday when the sun is shining, or rolling out of bed at the crack of 10:00am to make it to structural dynamics is pretty cool."

After graduation, Steve moved to Sacramento to work for KASL Consulting Engineers. This was a small, but very diverse company that provided exposure to many aspects of engineering during the ten years that he worked there. In 2000, Steve went to work for Wood Rodgers, a multi-disciplined engineering firm based in Sacramento. He became a partner in 2002, and a year later he moved to Reno to help open a new office. He now serves as the principal in charge of nearly 50 people, holds the position of Vice-President, and serves on the Board of Directors. Steve is a registered Professional Engineer in California.



Steve at the site of the Truckee Meadows Water Reclamation Facility Pump Station retro-fit.



Steve graduated from Cal Poly with none other than Dr. Fiegel!

The most memorable project that Steve has worked on was the Cooper Lake/Lake Tulloch Water Treatment Plant because of the level of design responsibility that he was given. "My favorite thing about being an engineer is using imagination and creativity to solve unique problems, and that project presented many interesting and unique challenges that broadened my skills considerably. It was very rewarding."

Outside of work, Steve has been able to speak at several SCE meetings on various topics and enjoys it very much. "It's great to meet so many sharp and capable young engineers, and it's a great excuse to visit San Luis Obispo." On the personal side, he has been married to his high school sweetheart for 21 years and has a son and daughter in high school.