CE CONNECTION

Spring 2016, Issue 19

Your Link to the Department of Civil Engineering

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SACRAMENTO STATE
Department of Civil Engineering

CONNECTION

Chair's Message

Dear Colleagues and Alumni,

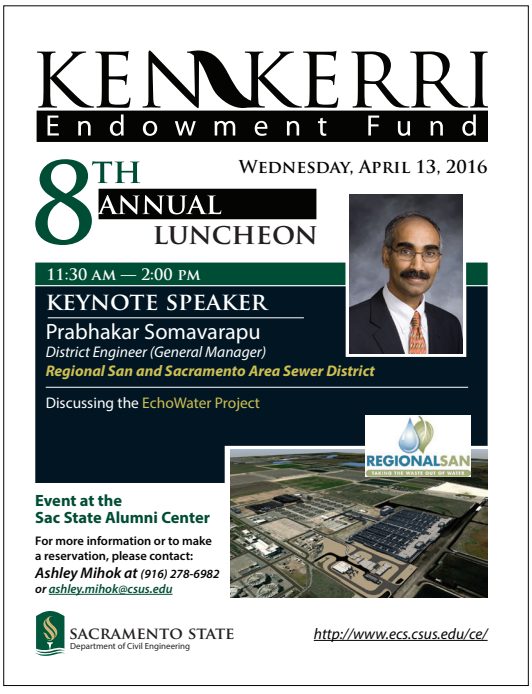
Happy spring! It's hard to believe the semester is more than half over, but as the old adage goes, time flies when you're having fun. As department chair, most of my time has been devoted to facilitating the interview process for two positions in the department. Both candidate pools are impressive, so I hope to be introducing new faculty in the summer edition.

Other efforts include preparations for the eighth annual Ken Kerri Endowment Fund Luncheon, set for April 13 at 11:30 a.m. We have a fantastic event planned, highlighted by Prabhakar Somavarapu from Regional San discussing the EchoWater project. If you haven't registered, the cost is only $30 and you can learn more on page 3. Simply contact Ashley Mihok at (916) 278-6982 or at ashley.mihok@csus.edu.

Many of the students are balancing their academics with preparations for the 2016 ASCE Mid-Pacific Regional Conference, hosted by the University of Nevada, Reno. Check out these great videos highlighting the work of the Concrete Canoe Team, the Steel Bridge Team, and Water Treatment Team, and read about Mid-Pac preparations beginning on page 10. Their passion for the competitions is contagious and they continue to excel compared to the other regional universities. I have no do ubt they will make Sacramento State proud!

Enjoy the newsletter and thanks again for your continued support of our Department.

Ben Fell—Chair, Department of Civil Engineering



Ken Kerri Luncheon Speaker Will Discuss EchoWater Wastewater Project

It's not too late to get your ticket for the eighth annual Ken Kerri Endowment Fund Luncheon, which will take place on Wednesday, April 13 from 11:30 a.m. to 2 p.m. in the Alumni Center.

This year's keynote speaker will be Prabhakar Somavarapu, General Manager of the Sacramento Regional County Sanitation District ("Regional San") and the Sacramento Area Sewer District. He will be discussing the EchoWater Project, a massive wastewater treatment project spearheaded by Regional San to meet the strict new treatment requirements issued by the state in 2010.

EchoWater is one of the most significant undertakings in the history of Sacramento. By the early 2020s, EchoWater will be in place, satisfying regulations and creating more opportunities for recycled water for irrigation. Even more importantly, EchoWater will provide cleaner water to be discharged to the Sacramento River.

Prabhakar has over 25 years of experience in various facets of water and wastewater systems in both private and public sectors. The luncheon will provide an opportunity to learn about EchoWater and ask questions after the keynote address. To reserve your place at the luncheon, which costs $30 per person, please contact Ashley Mihok at (916) 278-6982 or ashley.mihok@csus.edu.

Two Students Experience CTF Education Symposium

Exposure to young engineering professionals was the highlight of the California Transportation Foundation (CTF) Education Symposium for both Hayley Quan ('15) and Josh Gallegos, a senior. The two students attended the symposium in October 2015 at the UCLA Lake Arrowhead Conference Center.

After a meet-and-greet between student attendees and the professional transportation engineers who organized the event, the students were grouped into teams based on the region of their schools. They were then given a Request for Proposal (RFP) and asked to do a feasibility study.

"Our group analyzed the given RFP and went through the solutions we would be working toward," said Hayley. "We were trying to win the RFP, and some of the professionals acted as our stakeholders. We got to go around and interview them and ask what they were looking for, but they didn't tell us who the primary clients were until we gave our presentation."

Although Hayley and Josh's team didn't win the RFP competition, it was a valuable experience, along with the panel discussions and one-on-one mentorships that took place during the symposium. "It was a great chance to interact with professionals in their own community, because you really get to see their camaraderie," said Hayley. "The professionals are definitely looking at who the schools have chosen to represent them." Upon returning from the symposium, Hayley was able to get her foot in the door at HDR, where she now works, because Josh's mentor worked there.

"The symposium helped me to gauge my professional skills and how much more I needed to learn in the field of transportation," said Josh. "I really enjoyed learning all the necessary steps to create a winning RFP, and I got an idea of how hard I need to work as a professional engineer."

On the cover...

Students prepare a practice structure in preparation for the SEAOCC competition last fall. See story, page 7.

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Downtown Railyard Project is Focus of Evening With Industry

An Evening With Industry, held in November 2015 at the Alumni Center, hosted a standing room only crowd for the keynote speaker, Denton Kelley, managing principal of LDK Ventures, LLC. His firm acquired and is in the process of developing the downtown Sacramento railyard property.

"This project can be called a modern marvel when it's completed," said Mr. Kelley. LDK Ventures, LLC has developed the Stanford Ranch, McClellan Business Park and Placer Vineyards master plans. "We're local and we know the market. This project will be more balanced and nuanced toward creating more jobs."

Mr. Kelley discussed the cleanup that still needs to take place at the railyards, which is the responsibility of Union Pacific Railroad. He said, however, that the railyard development project will be closely coordinated with the cleanup effort. There are 1 million cubic yards of dirt to be removed from the railyard.

The developers hope to include a soccer stadium (of course, dependent on whether Sacramento acquires a professional soccer team) and plans are already underway for a Kaiser Permanente medical facility. There are also plans for office space, but it will be different than the office space downtown Sacramento currently offers.

"We want tech firms," said Mr. Kelley. "Office locations for them don't exist in Sacramento. The high-rise product is dead. We need more diversity of product – an urban community like in San Francisco."

He also discussed the lack of public space framework; in other words, an outdoor gathering place on par with Capitol Park. This project hopes to incorporate a dedicated pedestrian realm and a bike plan. "We are the only property that has private riverfront to develop," he said.

Mr. Kelley said the project will be flexible. "You can easily create a street market," he said. "In the daytime it would have cars, but be completely pedestrian for special events. We want restaurants and bars with a high degree of outdoor seating to celebrate the historical aspect."

> **"We want tech firms. Office locations for them don't exist in Sacramento... We need more diversity of product – an urban community like in San Francisco."** ***— Denton Kelley***

At the end of the day, said Mr. Kelley, this project has a lot of problems, but it will be great for the community. "You're in a field that you're solving problems," he said to the students and professionals in attendance. "You have to be creative. Problem solving is a function of creativity."

Sound Bites: Panelists Offer Professional Advice to Students

An Evening With Industry is designed to give students a sneak peek – and a head start – into the professional world of engineering. The five panelists at the event offered candid advice from each of their unique vantage points:

Megan Johnson, Transportation Engineer, Mark Thomas & Company, on how often students will interact with their fellow graduates:

"The people you go to school with, you will see them throughout your career – 10, 15, 20 years from now. The civil engineering program at Sac State is different. You spend a lot of time on campus. Value the people you're friends with because you'll know them for the rest of your life."

Megan Johnson on what she would have done differently:

"I didn't do extracurriculars. I'd participate more in things like that. I see our intern do it and it looks fun."

Megan Johnson on how many hours students can expect to work as professionals:

"What's expected is that you care about your job and take ownership of deliverables. Most of my weeks are 40-50 hours."

Brandon Cruz, Design Engineer, California Department of Water Resources, Division of Safety of Dams, on what he would have done differently:

"More reading and writing. Engineers like math and science, but you won't believe the amount of time you spend writing. That talent will help you move up in your career exponentially."

Brandon Cruz on how much students will work outside of their specialty:

"Twenty to 30 percent of my job is geotech. You have to know how other fields interact. There's no getting around that."

Ryan Cooper, Senior Engineer, California Department of Water Resources, Dam Surveillance North Section, on his experience taking the Professional Engineering (PE) license test:

"It's nerve-wracking. Set aside your life for three to four months. Study every weekend, evening – as hard as you can. You only want to take it once."

Ryan Cooper on what he would have done differently:

"Studied more. Studying took a backseat to internships."

Ryan Cooper on the value of a master's degree:

"I don't have an MS. When the market got tough, people wanted you to have an MS. Not having it limited my opportunities."

Eileen Crawford, Highway Bridge Program Manager, Caltrans, Office of Bridge, Bond and Safety Programs, Division of Local Assistance, on whether life is easier as a professional than as a student:

"Civil engineers are taught to solve problems – work, life, family. Once an engineer, always an engineer. The tougher the problem, the more fun it is to solve. This school teaches you a lot of aspects besides engineering."

Eileen Crawford on her experience taking the PE exam:

"Invest time in studying and review the study courses that are out there. Have your EIT by the time you graduate. The PE exam is a chunk of your life. The best beer you'll ever have is the one after finishing that exam."

Eileen Crawford on whether the economy has improved:

"In 35 years as a professional engineer, I've seen the economy go down three times. But it always comes back. The nice thing about civil engineering is that people still need sewers, water, streets, transportation."

Mason Hancock, Associate Engineer, Dokken Engineering, on the value of a master's degree:

"One of the big benefits is it kept me in a school mindset. I had friends who took the PE exam multiple times. Staying in the mood to study helped me out."

Mason Hancock on whether engineering provides job security:

"I've had no problems with job security. You get out what you put in."

All five panelists are featured in Alumni News & Notes beginning on page 15.

Sacramento State Reclaims Top Spot at SEAOCC Competition

The Structural Engineers Association of Central California (SEAOCC) holds an annual design competition for regional universities with civil engineering departments, and Sacramento State has won several times in the past. For the 2015 competition, which took place at Chico State in November, the team claimed victory once again.

The competition centers on building a wooden structure with a truss that has to bear a certain amount of weight. There are variations on the rules from year to year, but the basic concept is the same.

"One of the biggest differences between the Mid-Pac and SEAOCC competitions is that for Mid-Pac, we have the entire year to prepare," says Khaled Kanaan, a senior participating in the SEAOCC competition for the first time. "But for SEAOCC, they gave us the design less than six hours beforehand and let us loose. It's more of a test of theoretical skill."

This time, only three schools competed – fewer than usual – and Sacramento State took the top spot, with Chico State second and UC Davis third.

Once given the rules, "we had to react quickly," said George Brown, who was on 2015's winning team. "Luckily some of our members had prior experience with the material properties of timber. Knowing how timber reacts in situations can be one of the biggest factors of success for any team." He recalled how another school's truss didn't hold up well under the load due to a knot in the wood, which he learned in a prior year can mean a hollow spot in the wood.

"We had the same issue last year to an extent," said George. "Wood is an organic material, it's not like steel where it's consistent throughout."

Two wild cards relating to the wood came into play: "This was the first year when weight was not contributed as factor," said Khaled. "The wood was left outside unintentionally and it was wet. Normally you have to make the structure as light as possible, then they said weight was no longer a factor so we used a lot of wood to make it as rigid as possible."

With 10 minutes left to spare, the team drew the Sacramento State torch on their structure and started a trend of signing their names, and the other schools followed suit. The second phase of the competition is an oral presentation of the team's analysis, expectations and results to the professionals during the SEAOCC meeting. Their presentation incorporated professionalism and humor, and in the end their truss withstood 10,900 pounds of pressure.

"We were able to avoid the biggest worry I have when you get a bunch of engineers together," said George. "Sometimes there are too many cooks in the kitchen; everyone takes a different approach. But we had good teamwork. Designing isn't picking the best answer, it's picking an answer and making it a suitable one."

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Student Attends ASCE Conference in Alaska, Experiences Quake

January in Alaska is cold…and dark, with only about six hours of daylight. But George Brown loved every minute of his trip to Anchorage to meet fellow engineering students and professionals. George is president-elect of the Sacramento State student chapter of the American Society of Civil Engineers (ASCE), and he was the university's representative at the ASCE Region 8 and 9 Leadership Conference January 22-23.

The conference included three concurrent events, each one geared toward different levels of membership (section and branch leaders, Younger Member Council and student chapter leaders). But

there were plenty of opportunities for the three groups to mix and mingle.

"There's this really fascinating stigma that engineers don't communicate," said George. "The amount of coordination I saw was phenomenal. I attended the Workshop for Student Chapter Leaders, where we got to know members from other schools. We were taught how to prepare annual reports so we could continue to exist as student chapters of the professional organization." There were breakout sessions to further explore issues such as recruitment, funding and goals. Meanwhile, the professionals were attending their own workshops and team-building activities.

"I learned that every student is facing the same issues," George said. "We're learning the work ethic together. I hung out with UC Davis students and you wouldn't know we are competing against them. Competition gives way to collaboration in our major, and at the end of the day we all want the same thing."

The conference also provided chances for the students to interact with the professional members. "We're bringing the new lifeblood into the workforce, and the professional chapter and Younger Member Council embraced us with open arms," said George. "Every time I met someone new, they treated me with kindness and took genuine interest in the needs of our chapter. We were all focused on the same ideas and goals."

In the wee hours on the morning they were to return home, conference attendees were awakened by a jolt. "I was there for an earthquake and that was amazing," said George. "I thought someone was throwing a snowball at the window, but then the entire building started to shake. I went downstairs to meet professionals I'd already met and now they were talking about P waves and S waves. It became unofficial team bonding time."

The only damage was to the hotel's plumbing. "What a fitting way to end an ASCE event, near the epicenter of a quake," George laughed. "Everyone made jokes – none of the buildings fell down and that is thanks to the work of civil engineers. Apparently Alaska is an active zone for quakes because they're on the Aleutian arc."

George's involvement with ASCE has led him to participate in several Mid-Pac competitions, including last year's winning Steel Bridge Team, and he's participating this year as well. Citing the difficulty of the college's programs, in general, George says, "In civil engineering it takes an extra toll. I've noticed the people who do graduate and find success in civil engineering are the ones who tend to make it a lifestyle. I see [clubs like ASCE] as a huge opportunity to make engineering a lifestyle."

The conference in Anchorage reinforced that belief for George, and he's grateful for support from the university and ASCE for making his trip possible. "Every person I met was a huge support, encouraging my goal of being an engineer and wanting to help other people. Everyone there, all they want to do is try to make the world a better place."

Parking Lot Challenge and Networking are Highlights of ITE Summit

A weekend trip to Cal Poly Pomona before the start of the spring 2016 semester was more than just a joyride for Jasmeen Chahal, Luke Ervin, Kurosh Ghazizadeh and Vicky Vidales. The four attended the Institute of Transportation Engineers (ITE) Student Leadership Summit, an annual event that was hosted at Sacramento State in 2015.

"The whole time we were there, everybody was telling us how awesome Sacramento State's event was the year before," said Kurosh, who is president of the ITE student chapter. "Professionals, other students – throughout the weekend everyone was talking about last year's summit."

One of the key activities – mock interview "speed dating" – was replicated from last year's ITE Summit at Sacramento State. "In the mock interviews, students rotated to multiple professionals for two-minute interviews," said Luke. "The different ways each professional would ask questions was interesting. The feedback they provided was also extremely useful."

The summit's main event was a transportation project in which groups of students were given four possible locations for a parking lot on the Cal Poly Pomona campus and told to choose one and design the lot. The catch? "We had to go through stakeholder and public meetings," said Jasmeen, secretary for the ITE student chapter. "We had to accommodate everybody's needs to make the parking lot suitable in terms of design and alleviate traffic."

One of the goals of the summit is to meet new people, so students were grouped with other students they didn't know. The groups had to consider potential backlash from students and personnel at the college, neighboring businesses and the local community, as well as follow regulations from city personnel. The professional engineers attending the summit acted as the stakeholders and, according to Kurosh, "the panel wasn't shy about ripping [proposals] apart. My group got torn to shreds."

On Sunday, Jasmeen, Luke, Kurosh and Vicky had to leave the summit early since the semester was to start the next day, so they missed the final presentation portion of the transportation project. But Jasmeen's group – using the outline she wrote knowing she wouldn't be present – won and each member received a Kindle Fire.

"We picked the lot with the most traffic and it had small businesses nearby," says Jasmeen. "The small business owner said she didn't mind having a parking lot built there as long as it didn't affect her business. We offered

to allocate a few spots for her business. The area we were looking at had horses so we blocked off a section of the lot so the horses still had enough room to roam, and made sure pedestrians could get through and around safely. We allocated ADA spots and a few motorcycle spots. We tried to work with everyone to accommodate them."

In about 48 hours' time, the Sacramento State students got a rich and rewarding experience they would all recommend to other engineering students. "This was the best event I've done in six years at Sac State," said Kurosh. "The best thing I got out of it was summed up by one of the professionals. She said that when you're in the ITE student chapter, everybody you look around and see is going to be your ITE family. We thought, 'typical motivational speech.' But as the weekend went on we really made a new family, got to know these people and loved working with them."

Students Prepare for Mid-Pac Competitions

Students who are veterans of ASCE's Mid-Pac Conference are joining forces with newer recruits to represent Sacramento State at the upcoming Mid-Pac competitions April 7-9 at the University of Nevada, Reno. Here's a sneak peek at each of the teams and what they're doing to prepare.

Water Treatment Team

This team assembled just days before applications were due for ASCE's Mid-Pac participation, but they haven't wasted a moment since. "We were told there was a position available to lead the Water Treatment Team," said Michael Nishimura, a junior and co-manager of the team. "Jen-Ann Lee and I decided to take it upon ourselves to get it started."

The scenario given to the team by Mid-Pac is that a coastal town just hit by a major hurricane needs a way for evacuated citizens to sanitize water for a tap water supply for washing and cleaning. The team must add to 10 gallons of water a variety of contaminants including potting soil, vegetable oil, salt, corn starch and Hawaiian Punch. According to the rules, the goal is to "design a filter made of materials bought in a hardware store that treats a standardized wastewater based on the real-world scenario presented in the competition rules."

Teams will be judged on five factors, including the volume of water output, turbidity, electric conductivity, and pH level. "Filtering will involve putting the water through rocks, gravel, sand and screens," says Michael. "Treating it is adding chemicals – chlorine, baking soda – we don't know exactly what we're adding yet."

Luckily, Michael's team co-manager, senior Jen-Ann Lee, is a former chemistry major. "Michael's taking the lead on the construction aspect while I'm more focused on the chemical aspect of the experiment," says Jen-Ann. "Dr. John Johnston was kind enough to come help us out. He allows us to use the environmental lab whenever we need it. Earlier in the year, he even performed demos and how to use instruments."

With approximately 16 dedicated members, the Water Treatment Team has gone through several "runs" so far to test various methods, but they must be careful to conserve resources since keeping costs low is scored favorably. "Everything we drill, cut, soak, chemicals we add, opening or closing, we have to do on the day of competition," says Jen-Ann. "Right now, our biggest issue financially is using the product. We want to use it and know it'll work, but we don't want to waste it."

Some of the team members were on last year's Water Treatment Team, and they're learning from that team's mistakes and building on its strengths. Michael and Jen-Ann

are also finding that there's much more to leading the team than the experiment itself. "I'm learning coordinating skills, accounting skills and presenting skills," says Michael. "How are we getting there, funding rooms, or getting shirts made? There were a bunch of things we didn't know. We had to present our team to a board of environmental engineers in hopes that they would provide some support."

Collaboration has been a cornerstone of the team's approach to its design. "I look forward to every single meeting because I'm spending time with like-minded people, having a problem, and coming together to solve it," says Jen-Ann. "I like the camaraderie it forms. Obviously the competition gives me anxiety, but it's an 'excited nervous.' Just seeing what everybody comes up with shows how dedicated and innovative everyone is."

"I want the team to actually feel like they contributed to the project and the design," says Michael. "Everything I've ever had in this team has been open discussion. Now the design we use is going to encompass everybody's opinion and ideas. No matter what the results are this year, I'm very happy with our teamwork, dedication, and ability to stay focused at every meeting. We have a really solid team."

Steel Bridge Team

At last year's Mid-Pac Student Conference, the Sacramento State Steel Bridge Team swept six out of the seven categories in a historic showing that elicited tears of joy for some team members. "It was such a great feeling," says Khalid Kanaan, a senior who served on the 2015 project team and this year is president and lead project manager for Steel Bridge.

The team went to nationals and, although they didn't win, the victory and the actual bridge they constructed (still intact) have remained inspirational. Their success story fueled early efforts at recruitment for the 2016 team, which involved visits to the CE 1A class and the American Society of Civil Engineers (ASCE) student chapter meeting. Although early Steel Bridge Team meetings had more than 100 attendees, the group dissipated to approximately 25 – still a decent showing and a significant improvement over the number of participants in 2015.

"There are people who come to look and cheer us on," says Khalid. "And there are people who pour their heart, blood and tears into it. It's such a vast and consuming project. It takes a toll on you – in a good way."

This year's bridge specifications are quite different from last year's, when there was a body of water the bridge could not touch, but the team could cross it. This year the bridge must be split in half, they cannot cross the river and there must be a 6 ½-foot gap between team members.

"Designing and fabricating the bridge is half the competition," says Khalid. "The other half is how fast can you build it, and that's what costs schools the competition."

Fortunately the team is way ahead of schedule. "We're actually projecting to finish building the bridge within the month, versus last year we finished building it less

than 12 hours before the competition," says Khalid. "We have such a great group of new students that showed up this year. All of winter break, our tech shop was filled. Last year it was two of us. Looking at the progress we finish in a day, [designer] Will Cope and I are amazed."

Since only six can actually compete at Mid-Pac, the team will do time trials and take a vote to determine who is best suited for the high-pressure event. Whoever is chosen, the remaining students who worked on the fabrication over the past several months will be there to cheer them on. And the socialization and networking opportunities are a benefit to all those who attend Mid-Pac.

After the incredible success the Steel Bridge Team had in 2015, the bar is set very high. "If anything, it's fuel," says Khalid. Living up to the expectations "might be discouraging to some, but it really drives us. It was just a few people and we did this great thing. My team this year, we're already grooming them to take over the club next year. It is amazing. These students – their drive, their passion, they're everything you could wish for in teammates and friends."

Geo Wall Challenge

This team is smaller than some of the other Mid-Pac teams, with about six regularly contributing members, and only four can participate on the day of competition. Taylor Myers is a junior participating in the Mid-Pac Geo Wall Challenge Team for the second time – this year as project manager.

"Mid-Pac gives us the specifications of a box and we have to come up with a wall design to keep the soil held up," says Taylor. "Our goal is to build a mechanically stabilized earth wall using craft paper reinforcement."

Working with an 18 x 18 x 26 inch wooden box, the team must fill it will 300 to 400 pounds of soil, reinforced with craft paper strips, and then remove one wall, plus 8 inches on both side panels. Dr. Richard Armstrong, assistant professor of geotechnical engineering, is advising the Geo Wall Challenge Team.

"The structural aspect is new this year," says Taylor. "We have to build a cantilever loading arm, where we add weight and the soil has to withstand the rotational force as well as the internal pressure. Normally we have all four people able to help put the soil in the box, but now one person has to hold the cantilever arm inside the box, which has proven a hard challenge for us."

Someone on the team must hold in 2-inch sections of PVC pipe, which can't be screwed in; the team must ensure the soil holds the pipe up. During the actual competition, the challenge will be divided into three separate phases: the first two deal with cutting out the reinforcement. The last phase is actually building the box, and is the only phase that will be judged, but of course it's largely dependent on the first two.

"I'm really nervous because of the unusual loading on the box this year," says Taylor. "But I'm also really excited because my team members are really into it. We've gotten all new soil and gotten two or three boxes ready for the year so we're trying new methods and getting all these innovative ideas out there. It's a lot of fun."

Every few tries, the team has to build a new prototype, which Taylor acknowledges is not inexpensive. But she is confident things will work out in the end. "Our wall has not held in competition for the past three years," she says. "This year my team is really dedicated and we just want to go and have our design hold up. My team and I are really excited to go to competition and hopefully be in the top three."

Concrete Canoe Team

Arguably the most visual of all the Mid-Pac Competitions, Concrete Canoe has the distinction of requiring competitors to personally (and publicly) test their product by climbing aboard it, rowing it and demonstrating that it will float.

Another factor that differentiates Concrete Canoe is that the project must be completed ahead of time, not constructed onsite. Besides paddlers racing the canoe to show it's usable, the project is judged on construction, artwork, display and overall theme; a written report outlining the design, planning and construction; and an oral presentation.

"This year we're attempting to focus more on research and development," says Michael Lucas, a junior who's participating in his third Mid-Pac Conference and serves as captain of the Concrete Canoe Team. "We want to utilize more advanced materials. We've done a lot of intensive research within our mix, honed it down to what we needed it to be, then made a prototype to determine how it would work out."

About 25 students are participating in the Concrete Canoe Team project, and about 14 of those will go to Mid-Pac to paddle and/or take part in the presentation. The prototype has come in handy: "It's similar to what the design will be so it's good practice for everything from paddlers to the construction team, to structural analysis to artwork," says Michael. "We practice sanding, finishing and making it look pretty. When we get to the real canoe we'll have that more perfected and able to replicate what we've learned." The team has staggered the prototype canoe about two weeks ahead of their schedule for the actual canoe.

Even though this is his third time participating in Mid-Pac, Michael is finding that being team captain brings much more work and responsibility. In addition, this year a new rule is throwing students for a loop. "We can't stain the canoe, so we have to incorporate the artwork within concrete," he says. "Once you place the concrete the only thing you can place is a sealer. I've had contact with multiple other canoe teams and they're all panicking about this change. It's a very big wrench in the system."

With so many schools emphasizing the artwork on their canoes in the past, it's a big change indeed. The team has gotten creative and worked with concrete tiles. "We made them less than half the thickness of the canoe and used mesh reinforcement," says Michael. "The main problem with concrete is that it doesn't bond too well with concrete tiles, which is why we did it the night before. As reassurance we put mesh reinforcement in back. The concrete will bond to the mesh."

As the Concrete Canoe Team overcomes these and other obstacles, including being "grilled" by the judges during Mid-Pac, they are optimistic about making it to the national competition. "It's been a lot of work," says Michael. "I can't wait to get on the water and race the canoe. Whoever hasn't taken the opportunity to try these clubs out really should."

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NEWS & NOTES

Faculty

Dr. Ghazan Khan was recently chosen for the Sacramento State Outstanding Teaching Award. "I am truly honored by this award and want to sincerely thank all of my colleagues in the Civil Engineering (CE) department and the College of Engineering and Computer Science (ECS) for their help, support, guidance and mentorship since I joined Sacramento State," says Dr. Khan. "I truly believe this award is a testament to the welcoming and encouraging environment in our department and college which has helped me learn and grow. Most of all, I want to thank the CE and ECS students, who are the main motivation behind my success. Serving the students is what drives me the most and all my efforts are geared toward their success."

Dr. Benjamin Fell is the recipient of the Sacramento State Outstanding University Service Award. "It's an honor to be nominated for, and receive, this award," he said. "I'm a strong proponent of shared governance at a university where faculty leadership is so critical to advance the initiatives and services we provide to our students."

Dr. John Johnston recently gave two presentations about the stormwater improvement project on campus (highlighted in the Fall 2015 issue of CE Connection). In November 2015, Dr. Johnston and Maureen Kerner, PE, of the Sacramento State Office of Water Programs (OWP) presented "Installing LID as a Retrofit: The Sacramento State LID Project" at the Low Impact Development (LID) Regional Conference, which took place on the Sacramento State campus and was cosponsored by OWP. In February 2016, Dr. Johnston and Maureen Kerner presented "Stormwater as a Resource: Sustainable Projects at Sacramento State" at the STEM Lecture Series on campus.

Students

Jasmeen Chahal recently received the Tim Fleming Memorial Scholarship in the amount of $2,000. Jasmeen, a senior who plans to graduate in December 2016, was pleasantly surprised: "It was a really good experience going to the scholarship dinner, meeting new people and hearing about all the new things going on," she says. "This will allow me to take a summer class and that will make my last semester a lot easier. I have to give a lot of credit to Dr. [Ghazan] Khan for encouraging me to apply for this scholarship."

Will Cope, was awarded a $1,000 scholarship from the Structural Engineers Association of Central California (SEAOCC). Will is the president of the campus chapters of the American Society of Civil Engineers and the Earthquake Engineering Research Institute, and lead designer for Sacramento State's Steel Bridge Competition Team for Mid-Pac. "This scholarship was a huge help with paying off some off the debt that I have incurred throughout school," says Will. "It meant a lot for me to be recognized for the scholarship because I am avid about being a structural engineer and was glad that my work and accomplishments were recognized by the organization."

Alumni

2007... Mason Hancock, PE (MS, '11), was a panelist at November's An Evening With Industry. Says Mason, "Completing both my BS and MS in Civil Engineering at Sacramento State gave me the foundation of skills and knowledge necessary to specialize in the design of bridges, retaining walls, drainage structures, special sign foundations, and other transportation-related structures. I have also provided construction support and inspection services, field assessments of existing bridges, dynamic structural analysis of existing bridges, and developed several retrofit and widening strategies."

2007... Since graduation, Megan Johnson, PE, has been working for Mark Thomas & Company as a transportation engineer and received her PE license in 2009. She has had the opportunity to work on many local transportation projects, including the Oak Street roundabout in Roseville, the Project Study Report for the future Hazel Avenue/Highway 50 interchange improvements in Sacramento County, and Regional Transit's light rail

Student Profile

Srishti Thakur

A senior with a passion for structures and helping steer young women toward engineering, Srishti knows she is exactly where she's supposed to be.

What drew you to civil engineering?

Structures. I first went into it because of my dad. As I was picking my college majors I was always into medicine, but as backup my dad said to apply for engineering. I got into the civil engineering program at Cal Poly San Luis Obispo. I started liking it and realized I'm into structures. I liked studying anatomy; that was studying structures of the body, which is similar to structures like bridges. I know that sounds weird, but I was always into finding out how bridges, buildings or cities were built. I lost interest in medicine after a while. I feel like engineering is my calling now. My dad is pretty happy.

Why did you choose Sacramento State?

Sacramento was much closer [than Cal Poly SLO]. I'm glad I ended up here. The feel of how faculty treats you and how you feel around the students – I just bonded to this school. It's much more diverse. And I could see my family every day. I didn't have to wait for a special holiday to see them. Everybody always encouraged me here.

They prepare you really well for the real world and not just for a job, but as a person. They really build that civil engineering character. A lot of my teachers work in the field and are very honest and hardworking people, and I just love that about them.

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NEWS & NOTES

extension in South Sacramento. Megan enjoys volunteering with Sacramento State's Civil Engineering program, and has been helping with the Senior Project classes through teaching "boot camps" for key components of the projects. She married her husband Shaun in 2010, and together they have a 10-month-old daughter, Victoria, and an Australian Shepherd dog, Sadie.

2007... Brandon Cruz, PE (MS '14), moved to Guadalajara, Mexico after graduation and lived there for a year. Upon his return to California he joined the Department of Water Resources – Division of Safety of Dams. He reviews and analyzes plans and specifications for the construction, enlargement, alteration, and/or repair of dams in California. Analyses include geotechnical slope stability, liquefaction assessment, site and embankment response analyses, nonlinear deformation analyses, hydrologic and hydraulic analyses for spillways and outlets, and structural analyses of concrete dams and appurtenant structures. He obtained his PE license in 2012.

Brandon remains involved with the engineering program at Sacramento State by serving as a mentor for the MESA Engineering Program as well as one of the panelists at Evening with Industry this past November.

Brandon attended the World Cup in 2014 in Brazil with fellow Sacramento State alumni (Ismael Echeverria, Eric Echeverria, and Brandon's cousin Kristy Fortes). He also backpacked through Europe for a month in the spring of 2015 with his cousin Rafael Garcia (also a Sacramento State alumnus).

2005... Ryan Cooper, PE, worked for Wood Rodgers Inc. from 2005-2011, primarily working on hydrologic and hydraulic analyses. He obtained his PE license in 2008 – the same year he married his wife, Tina. Ryan began working for the California Department of Water Resources (DWR) Dams and Canals Section, focusing on State Water Project (SWP) construction drawings, repairs and analyses. In 2012, Ryan and Tina welcomed their first child, Sofia. In December 2015, Ryan was promoted to senior engineer at DWR in the Dam Surveillance North Section, where he manages and coordinates dam safety efforts for Upper Feather River and Oroville-Thermalito Complex facilities.

2001... Becky Money, PE, GE, CFM (MS '06), was recently promoted to lead the Geotechnical Engineering team at Kleinfelder, where she has worked since 2000. Becky's expertise includes geotechnical engineering applications, construction observation, materials testing and inspection, and forensic evaluations on various projects. She has completed numerous geotechnical engineering studies related to dam and levee evaluations; public roadway infrastructure and interchange projects; light rail projects; water and wastewater treatment facilities; small- and large-diameter buried pipelines; schools; and residential and commercial developments. As assistant lecturer at Sacramento State, Becky taught a soil mechanics course from 2008-2012. She also is an active participant on Sacramento State's Civil Engineering Professional Industry Advisory Committee (CEPIAC).

1982... Eileen Crawford is a Highway Bridge Program Manager at the Caltrans Office of Bridge, Bond and Safety Programs, Division of Local Assistance. She was a panelist at An Evening With Industry in November 2015. Eileen's career path started at the Caltrans "Bridge Department" over 30 years ago. She worked on nearly 20 construction projects throughout northern California, as Resident Engineer and/or Structure Representative on 11 of those projects. Eileen later moved to the California Board of Professional Engineers and Land Surveyors as their Civil Engineer on staff. Eventually she missed the ability to actually be a part of creating fixed works, so her next career leap was to the County of El Dorado, Transportation Division, leading the Stormwater Program and Land Development project conditions and reviews.

Eileen is now back playing with bridges at Caltrans. She is part of the management team for the Highway Bridge Program, distributing and monitoring $300 million a year to replace and/or repair bridges for local agencies throughout the state. Eileen and Michael Crawford (BS, '81) met at Sacramento State and have been married for 32 years. Their three adult children all live and work in the Bay Area.

Continued
Student Profile, Srishti Thakur

Tell us about your involvement with the Society of Women Engineers (SWE).

I started as event coordinator then became vice president. I wanted to help other girls and show them that girls can do engineering and can be in STEM fields. I have many sisters and cousins, so I know what kind of motivation they need.

March 10 is SWE's Shadow Day. We'll have several engineering classes where they do demonstrations in each discipline. All the girls get to experience a piece of each major and see which one they like. We'll have a panel where industry women will share their experiences. I'm very excited about that; it's our biggest event of the year and we've been planning it since summer. It's the one thing we get to give back from our journeys.

How else do you like to be involved?

I started this trend (as last year's ASCE Event Coordinator) where we have civil engineering versus mechanical engineering playing soccer and basketball, and get faculty involved as well. When faculty scores they get double points. I wanted to get the departments together; there's always kind of a rivalry between them. It's been fun.

Which class have you enjoyed most?

My favorite class has been CE 113, the Structures Lab. We tested steel beams and made actual reinforced concrete beams. I liked how practical it was and after that class every time I look at a bridge or building, I can see the forces applied to it and I get really excited and curious about how it all came to be. Understanding how structures are loaded and the equations – the theory – made sense once I got to do it practically in a lab setting.

Do you find yourself leaning toward any one aspect of civil engineering?

I get very passionate about a lot of things in engineering but so far, structures are for me. I'm considering transportation as well. I hear all the time people think they're going to do structures or soils but after getting in the field they decide they like water resources.

Structures don't come as naturally as some of the other subdisciplines, but I'm more passionate about them. I can stay up all night researching structures and won't be bothered by the amount of work, but in some other classes I have to work harder.

I like how this school is so well connected with the industry. If somebody wants to do something there are endless opportunities at this school. Everybody is always willing to help you. The chances are always there if you are really willing to go for it.

Alumni Spotlight

Tom Tracy: A Strong Foundation

Tom Tracy's more than 30 years of experience as an engineer licensed in California, Nevada and Washington is impressive. He's been a part of some prominent bridge and transportation projects that any Californian would recognize. But in his college days at Sacramento State, he faced the same uncertainty many students do.

"I knew I wanted my major to be in civil engineering, but after about the second semester I realized I wasn't as equipped as I thought I'd be for the rigor of the program," says Tom. "I was surprised how hard it was." So he gave himself the freedom to take some courses outside of civil engineering – most notably, photography. He thoroughly enjoyed the distraction, and it ultimately helped him decide to buckle down and get an internship at the Sacramento Municipal Utility District (SMUD), which he learned about through the university. That focused his attention back on engineering and he graduated in 1981.

SMUD kept Tom on after graduation as an associate civil engineer, where he was thrilled to be assigned as project manager on an underground electrical transmission line project in downtown Sacramento. "That was really fun," says Tom. "It went through downtown streets, dug up the streets and created a big mess. But it was very important; it connected some of the major power substations and created electric service redundancy for downtown."

After more than eight years with SMUD, Tom took even more high-profile work as a senior bridge engineer at Imbsen & Associates, Inc. "Right after the Loma Prieta earthquake, we were involved heavily with Caltrans on the earthquake retrofit of bridges," he says. "We got to work on the Golden Gate Bridge, parts of the San Francisco-Oakland Bay Bridge and lots of other bridges around the state."

Tom's career veered toward transportation engineering when he joined Parsons Brinckerhoff in 1996 as vice president and senior engineering manager. He continued working on bridge projects and then on transit projects. He was closely involved with the South Sacramento Corridor Light Rail Project (the "Blue Line") that expanded light rail from downtown to Meadowview Road, a project he says was very fulfilling.

During his 15 years at Parsons Brinckerhoff, Tom moved to Washington to work on a project to replace the earthquake-damaged Alaskan Way Viaduct freeway along Seattle's waterfront. He then returned to California to oversee a consultant team performing preliminary engineering and

environmental documentation for the Fresno to Bakersfield portion of the High-Speed Rail project.

"I haven't worked on anything I originally thought I would," says Tom. "When I left Sac State I thought I'd be working in water resources engineering. I haven't worked a day in it. I went from electrical facilities to bridge design and then transit. At Sacramento State, you get a good foundation and you may end up completely somewhere other than you thought you would."

Currently a principal transportation engineer and project manager at TRC Engineers, Inc., Tom has always maintained a connection with his alma mater. He's lectured in the CE 1A course, co-taught a Contracts & Specifications course, and acted as a "client" being pitched a project for the CE 190 (senior project) class.

Perhaps most notably, Tom's been a member of the department's Civil Engineering Program Industry Advisory Committee (CEPIAC) since 2000. CEPIAC acts as a liaison between faculty and the professional engineering trade, influencing the curriculum to meet industry needs. "I think the CE 190 course was an outgrowth of the input we had early on," says Tom. "We were seeing graduating students who were really good at engineering fundamentals but we wanted them to work more as a team, or know how to write, or not be scared to talk in front of other people. The school provides a product by educating these young engineers and we are the ones who'll employ them, so it helps us get a good look at the product: how those engineers are being trained."

The Sacramento State concept of creating a well-rounded civil engineer has served Tom well, and as a professional he appreciates the trait in new graduates. "You're about to get an education that will give you the foundation to do a lot," he advises current students. "Don't get hung up on wanting to be in a particular specialty. I don't expect new engineers to be able to develop a full set of design plans, but I do

expect they'll listen, learn, take direction, work as a team and use their fundamentals to figure it out. We know Sacramento State graduates have the skills; we can help mold them."

Recalling his most memorable professors – Bill Neuman, Ralph Hwang and the late Ken Kerri – Tom says today's Sacramento State students are equally blessed with faculty guidance. "They've done a really good job over the years of fostering industry involvement," he says. "They're not just instructors, they're really cheering for the students to do all they can and show them where to find opportunities. They're trying to take some of the mystery out of that hard transition from being a teenager to an adult."

A married father of three, Tom enjoys unwinding with a good hike or camping trip and loves exploring craft beers. He continues to enjoy a thriving career and finds mentoring younger engineers rewarding. At Sacramento State, says Tom, "I enjoy the interaction with faculty and students. I hope I can provide some guidance in their mission, but I learn things, too. It's a two-way street."

CONNECTION

Support the Department

Looking for a way to support the Civil Engineering Department?
We have four different funds that enhance our ability to educate students:

- The Ken Kerri Endowment Fund – Gifts to this fund support faculty and student enrichment activities.
- The CE Freshman Scholarship Fund – Scholarships are given to outstanding freshmen.
- The Graduate Environmental/Water Resources Scholarship Fund – Scholarships go to deserving graduate students in the environmental or water resources engineering areas.
- The Department Trust Fund – These resources support student attendance and participation at conferences and competitions, senior design project team expenses, and equipment for labs when other funds are not available.

To donate to any of these funds, go to www.ecs.csus.edu/ce/support.html and follow the directions for online donations. Or mail a check made out to the appropriate fund to the Department of Civil Engineering, Attn: Ashley Mihok, California State University, 6000 J Street, Sacramento, CA 95819-6029.

The Civil Engineering and Mechanical Engineering departments got together for the second time during fall 2015 for basketball and soccer games, a tradition begun in spring 2015. Civil Engineering won the basketball game, Mechanical Engineering won the soccer match, and all had a great time!

UPCOMING EVENTS

April 7–8, 2016:
Mid-Pac Competitions at University of Nevada, Reno

April 13–17, 2016:
Alumni Week

April 13, 2016:
Eighth Annual Ken Kerri Endowment Fund Luncheon

May 6, 2016:
Fifth Annual Civil Engineering Golf Tournament

May 13, 2016:
CE 190 Student Project Presentations