Your Link to the Department of Civil Engineering

CE CONNECTION

SPRING 2018 | ISSUE 25

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SACRAMENTO STATE
Department of Civil Engineering

CHAIR'S MESSAGE

Dear alumni, colleagues and friends,

I hope you enjoy reading the spring 2018 CE Connection newsletter, our quadranscentennial issue!

The department and our industry advisory committees have been busy planning our 10th Annual Ken Kerri Endowment Fund Luncheon, taking place on April 10th at Sacramento State, featuring a talk by Mayor Darrell Steinberg on Sacramento's infrastructure needs. I expect it to be an engaging and significant presentation on planning efforts for transportation networks and new construction. Special thanks to Marco Palilla (HDR), Bill Busath (City of Sacramento), Ric Reinhardt (MBK), Rick Liptak (Dokken), Ramzi Mahmood (OWP), and Ashley Mihok (CE Department) for their efforts. For more information, and to register, visit:

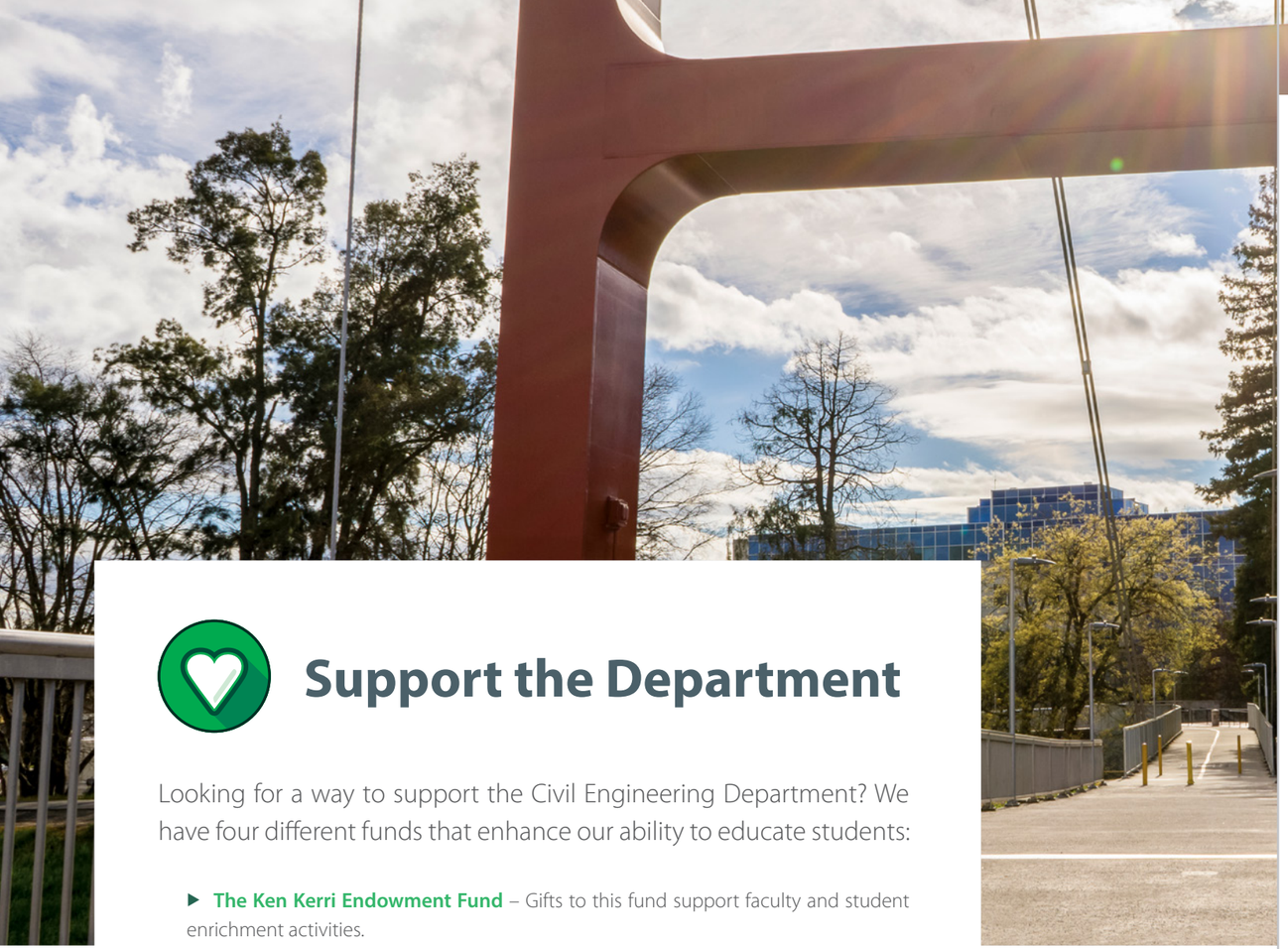
http://www.ecs.csus.edu/ce/kkefl-flyer-2018.pdf

Primarily led by our remarkable student leaders, with administrative assistance from the department, the ASCE student chapter has been busy planning the 2018 ASCE Mid Pac student conference, co-hosted by Sacramento State and the University of the Pacific. The conference features competitions from across the various areas in civil engineering. The conference will bring 800+ students to campus April 19-21 from universities across Northern California, including two universities from China and one from Egypt. December graduate Taylor Myers ('17) has been especially vital to the organization of the chapter.

I hope to see you at the Ken Kerri Endowment Fund Luncheon, where I can share more news about our department!

Ben Fell – Chair, Department of Civil Engineering

SACRAMENTO STATE
Department of Civil Engineering



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:

Attn: Ashley Mihok
California State University, Sacramento
Department of Civil Engineering
6000 J Street, MS 6029
Sacramento, CA 95819

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Upcoming Events

Gain access to all of these events through the Department of Civil Engineering Sponsorship Program! Information for 2018 sponsorship is now available at:

http://www.ecs.csus.edu/ce/pdfs/sponsorship2018.pdf

April 10, 2018:
10th Annual Ken Kerri Endowment Fund Luncheon

April 19–21, 2018:
Mid Pac Conference Hosted at Sacramento State

September 14, 2018:
7th Annual Civil Engineering Golf Tournament, Mather Golf Course

SACRAMENTO'S
FUTURE INFRASTRUCTURE NEEDS

TUESDAY, APRIL **10**

SACRAMENTO STATE ALUMNI CENTER

11:45 AM – 1:30 PM

Tickets may still be available for the landmark 10th annual luncheon to support the Ken Kerri Endowment Fund, taking place on April 10 at 11:30 a.m. in the Harper Alumni Center on campus.

Sacramento State is proud to welcome Mayor Darrell Steinberg as the keynote speaker for this "10th on the 10th" event. Mayor Steinberg was elected in 2016 and previously served for 16 years in the California Legislature, most recently as Senate President pro Tempore.

A native Californian and longtime Sacramentan, Mayor Steinberg is in a unique position to discuss the region's infrastructure needs, which will be the topic of his address at the luncheon on April 10.

The Ken Kerri Endowment Fund has a multifaceted set of goals designed to attract and develop top faculty and students to the Civil Engineering Department. By attending this event (and contributing to the fund), you honor Dr. Kerri's legacy to the future engineers who will graduate from Sacramento State.

For tickets to the Ken Kerri Endowment Fund Luncheon ($30 per person), or to become a sponsor please contact Ashley Mihok at (916) 278-6982 or Ashley.mihok@csus.edu.

Event RECAP

14th ANNUAL

AN EVENING WITH INDUSTRY SPOTLIGHTS CLARK PACIFIC'S WORK ON APPLE PARK

A buzz of excitement filled the air in the jam-packed Harper Alumni Center on Nov. 2, when An Evening With Industry brought its trademark learning and networking opportunities to civil engineering students and industry representatives.

"All our events are great, but I like this one especially because it has the largest turnout from our student body," said Dr. Benjamin Fell, PE, Chair of the Civil Engineering Department. "There's a lot of university administration here and about 20 companies from the industry. Everyone in the same room, at the same time seeking to further education at Sac State."

"There's a lot of university administration here and about 20 companies from the industry. Everyone in the same room, at the same time seeking to further education at Sac State." — Dr. Benjamin Fell

Sacramento State President Dr. Robert Nelsen marveled at the turnout of students and alumni, proclaiming to the industry representatives in attendance that "You get the best students in Sacramento, in California, in the United States and in the world when you come to Sac State!"

Before introducing keynote speaker Grant Guerrieri, PE, of Clark Pacific, Dr. Nelsen called forward Donald and Robert Clark, sons of cofounder James Clark who are now partners operating the family-owned company. Dr. Nelsen presented them and their mother with a plaque commemorating Clark Pacific's work on the campus' new parking structure, and announced that the university had received a $200,000 gift from Clark Pacific for major renovations to the concrete lab. *(See article on page 18)*

Mr. Guerrieri's talk showcased Clark Pacific's completion of the jaw-dropping Apple Park campus – the tech giant's headquarters office is the largest prefabricated concrete building in the world.

As the largest precast concrete manufacturer on the west coast, Clark Pacific had major projects like San Jose International Airport and Levi's (49ers) Stadium under its belt when the company took on Apple Park. It required Clark Pacific to hire hundreds of employees in a few months and to create a 140-acre campus in Woodland – complete with its own water treatment plant – specifically to fabricate the nearly 5,000 massive concrete panels needed for Apple's office and parking structures.

"All the concrete panels had to have smooth, rounded corners like the iPhone," said Mr. Guerrieri. "Apple wanted to review every single panel and inspect them. If they had any little mistakes, they had to go back to make them again."

Manufacturing of the precast panels necessitated a machine that would flip the huge sections to make them upright. The "whopper flopper," as it was called. is a device Clark Pacific engineered to flip and rotate the huge concrete panels, which weighed more than 100,000 pounds each. "It took 15 minutes to flip a panel, and honing the concrete took about an hour," Mr. Guerrieri said. "There were a lot of algorithms involved in planning that."

The completed concrete panels were stored and staged at the job site, where a tent city was constructed to protect them from the elements until they were needed. All told, said Mr. Guerrieri, the 6 million square feet of Apple Park's structures were erected within 12 months.

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 six panelists at the event offered candid advice from each of their unique vantage points:

MARK RAYBACK, PE, Vice President at Wood Rodgers, Inc., on the difference in working the public vs. private sector as a junior engineer: "There are a lot of similarities at the entry level. You spend time learning design processes, requirements, tools. Private and public have the same tools. The difference is the culture. Don't be afraid to move around and see what's out there. It's a great big world."

MARK RAYBACK on the interdisciplinary nature of engineering projects: "From a transportation perspective, you do surveying, environmental studies, geotech – that's all before design – then drainage studies. A big part of roadway design includes water resources design and stormwater design. There's electrical folks for traffic signals, landscape architects – no single person does it all. Learn to work on a team. That's your future, whether you like it or not."

MARK RAYBACK on how his career prepared him to start his own firm: "Have a broad understanding of the business you're in. It's easy to focus on only one thing, but if you want to be in management, ownership or leadership positions, you need to understand a little about a lot. Being Type A and ADD actually helps. Have a broad perspective and don't lose sight of what you want to do."

DEANA DONOHUE, PE, President/CEO of Myriad Engineering, on the most challenging aspect of starting her own engineering firm: "Making the decision. Considering the returns. I woke up Jan.1 and decided, 'I'm going to do this.' You have to invest money to make money, and it's scary because there are no guarantees. I was working 16-hour days at the job I left and thought there had to be a better way. I decided that if I'm going to work 16-hour days, I'm going to do it for myself."

DEANA DONOHUE on career paths for water resources engineering: "The water field is wide open: water utility, public agency or firm – there are a lot of choices. Know what you want to learn. Pick three things and learn them well. Find a person to teach you. From there you build a career and the opportunities are endless."

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>
> — Deana Donohue, PE
> President/CEO of Myriad Engineering

DEANA DONOHUE on how her career prepared her to start her own firm: "One word: network. You need to know a lot of people and have them in your pocket to call on. I can't stress enough about emotional IQ – how to read people and do it quickly. As a business owner or someone in a high-level position, that's the number one thing: understanding people and getting along with them."

ADAM KILLINGER, PE, GE, Northern California Region Engineer at Geopier, on what it's like working full time while earning a Master of Science degree: "It's not easy, there are a lot of late nights and coffee. You take evening classes. It's doable, but you've got to be all in. There's not a lot of social life."

ALBAN GJONGECAJ, PE, Associate Engineer at Burne, on how important a master's degree is to a civil engineer working with structures: "It's kind of necessary. If you look back to the 1970s in architecture, medicine, engineering, nursing – in most of those fields, it now takes nearly 10 years to get a degree. Civil engineering is the only one staying near four years [for a bachelor's degree]. The field is becoming more complex and codes are so long. A master's will help a lot with fieldwork; you'll have a better sense of what will and won't actually work."

JON MONEY, PE, Senior Engineer at El Dorado Irrigation District, on how working on the Mid Pac Concrete Canoe team and other extracurricular activities helped him professionally: "Anywhere you can establish relationships, get to know people, learn other aspects of civil engineering – any opportunity to network and grow outside your set of skills is core. It's the same thing with taking classes: you may not use it all in real life, but the exposure is priceless."

JON MONEY on career path suggestions for environmental engineering: "It's wide open. As environmental regulations get passed, it gets more complicated. The key is finding the work environment you can excel in, or a key interest you can pursue. There are plenty of opportunities."

JULIE REISCHE, PG, Geologist at Wood Rodgers, Inc., on whether a master's degree is vital for work in the water and environmental fields: "I highly recommend getting your master's; mine is in geology. It's useful to approach a problem, collect data, analyze and report. In industry all projects you have to gather data and get a design solution. I've noticed my master's helps with report writing and with those technical aspects."

Some of the panelists are featured in Alumni Notes beginning on page 26.

ASCE CONFERENCE DEVELOPS *Student Chapter* LEADERS

Five civil engineering students traveled to Las Vegas in January for a conference designed to sharpen the skills and professional networks of student leaders in campus chapters of the American Society of Civil Engineers (ASCE).

The student leadership conference hosted students from ASCE regions 8 and 9, which encompass the western United States, Alaska, Hawaii, and large swaths of Canada. Students Destiny Lor, Harpreet Gill, Joseph Salazar, Nathaniel Wilson and Michael Almazan represented Sacramento State's ASCE student chapter, attending with financial support from ASCE, the College of Engineering and Computer Science, and a Student Academic Development grant from the university.

"The conference is really focused on leadership and getting to know your branch and your section," said Destiny, a second-year student who is vice president of the ASCE campus chapter. "They want to educate us, so they had a workshop about annual reports. We have to report to ASCE how much money we made and used, how many national members we have, our meetings and events."

Another workshop covered interpreting body language – a skill that Destiny acknowledged may come in handy during the students' future careers. Chapter leaders were also encouraged to formulate at least three goals for the year.

"That might include setting up events, or setting a goal to get 20 percent of civil engineering students to become national members," Destiny said. "ASCE encourages students to become national members, which is totally free and helps them get emails about section grants and other information."

A key element of the two-day conference was the interaction between student chapter leaders, ASCE professional members and members of ASCE's Younger Member Forum (YMF), which is comprised of under-35 civil engineering professionals.

"It was very open in terms of networking with professionals," said Michael Almazan, a third-year student who is active in the chapter and has a leadership role in the upcoming Mid Pacific conference. "They group you with YMF as well as ASCE members, so at your table you had different perspectives. The YMF members have a couple years of experience and ASCE members have more than 10 years [in the profession], so you had a broad range of experience with you at all times, which I thought was pretty cool."

The relationships established at the conference allowed students to connect with professional engineers on LinkedIn and other social media channels, and those professionals offered to stay in touch and provide guidance to the students as they progress in their academic careers.

"YMF members were so welcoming to the students," said Destiny, who realized many benefits from attending the conference. "It was an eye opener to see ASCE outside the university and to see that we're not alone – there are other people around us. We're just one click away to ask someone for help. ASCE is built on community, not just one person."

Environmental Lab GETS UPGRADE FROM APWA GRANT

The environmental lab used by students in Civil Engineering will receive some new, state-of-the-art research equipment thanks to a winning grant proposal submitted to the Sacramento chapter of the American Public Works Association (APWA) by Civil Engineering Professors Dr. John Johnston, PE, and Dr. Amir Motlagh.

The APWA grant is part of the chapter's annual call for proposals from Sacramento State, CSU Chico, University of the Pacific and UC Davis to receive grant funding from its Education Endowment Fund. Sacramento State's proposal included a request for a spectrophotometer; a research-grade fluorescent microscope and three compound microscopes for students; various lab equipment; and a Go Pro camera with a drone. All of the microscopes have cameras that can be connected to computers and projectors. The total cost of the requested items will be covered by the $21,500 grant from APWA plus a $5,000 contribution from the College.

"The spectrophotometer will use Hach kits to easily perform a wide range of chemical analyses. This will allow us to expand our repertoire of student labs. We'll use the Go Pro camera to make videos of lab procedures, sampling sites, and things like that," said Dr. Johnston. "With the drone we can fly over rivers and treatment plants, and show students aquatic ecosystems and engineered facilities they mostly haven't seen before. Plus, it'll get more use than just environmental. Both the water resources and structures faculty have expressed interest in borrowing it to photograph Delta waterways and building projects."

Dr. Motlagh, who joined the department in 2017 and studies microbial communities in wastewater treatment, is excited about the microscopes: "The teaching microscopes will allow students to observe bacterial cells, algae, and protozoa in various environmental samples to better understand different forms of life, and to recognize human health concerns due to microbial contamination," he said.

"Students will evaluate the microbial communities in water and wastewater samples at different stages of treatment to identify the effects of physical and chemical processes," continued Dr. Motlagh. "These demonstrations will help bridge the gap between classroom biological concepts and their application in environmental engineering."

"The APWA grant is the largest single grant we've ever received for the environmental lab," said Dr. Johnston. "Lab upgrades are a strategic priority for us, and we appreciate the college's contribution that augments this grant. We are very pleased and grateful to receive it, especially upon the 10th anniversary of establishing the Ken Kerri Endowment Fund."

Sacramento State to Host

MID PAC CONFERENCE

APRIL 19-21

The Upcoming American Society of Civil Engineers (ASCE) Mid-Pacific Region (Mid Pac) Conference brings a new element of excitement this year, since Sacramento State's ASCE campus chapter will cohost the competitions on campus together with University of the Pacific's ASCE student chapter.

"All the events are either in the union auditorium or in one of the parking lots," says Taylor Myers, '17, a former officer in the campus ASCE chapter who graduated last December, but as Sacramento State's conference chair, remains very active in planning the event. "We have 16 schools participating this year. Five of those are international, representing China, Egypt and Canada. We're expecting a total of 800 people, including judges and volunteers."

With the assistance of student coordinators and guidance from faculty like Department Chair Dr. Benjamin Fell and Professor Peter Ouchida, Taylor manages conference budgets, locations and logistics, and reaches out to local firms to arrange professional engineers to serve as judges. Taylor says most of the officers of the ASCE Sacramento Section Younger Member Forum are serving as judges. "We try to connect with people who are suited for the competition," she says. "We want students to be able to interact with people they're going to be in industry with and help them get jobs."

New for this Mid Pac will be a mini career fair that will be open during much of the competition, where representatives of the firms that are lending support to Mid Pac can set up a table to interact directly with students.

"ASCE gave me so much during school and helped me become a professional," said Taylor. "I want to make sure these students get the same opportunities. All our officers are new this year and they're ready to get involved. It's exciting to see the new generation come in."

TRANSPORTATION CHALLENGE

Students participating in the Mid Pac Transportation Challenge will develop a streetcar system that crosses Tower Bridge from West Sacramento and continues to 3rd Street and Capitol Mall, then north to 3rd and I Streets. The cars will be attached to a track and powered by an electrical grid, marking the first time public transit has been part of a Mid Pac transportation challenge, said Michael Almazan, an officer in the ASCE campus chapter who wrote the Transportation Challenge (therefore he cannot compete at Mid Pac).

"There's a large amount of traffic analysis because the transportation component is mostly on roadway design," said Michael. "Multiple streets are involved. They're dealing with Tower Bridge, which can move vertically, so there are a lot of aspects students have to watch out for."

Michael, who is participating in Mid Pac for the second time, is grateful for the mentorship of Gaby Lopez ('17), and Ashley Arreola ('17). "Gaby helped me a lot with the problem statement and Ashley helped me find data."

Unlike in previous Mid Pac conferences, the Transportation Challenge teams will present their findings in front of an audience of all the other Mid Pac teams. "In past competitions it was only

the team and the judges, but for this year every team will watch the other team's presentations," said Michael. "I think with a bigger audience the teams will have more pressure, but it also gives clarity to the other teams showing that a team deserves to win because their presentation was great."

Although he misses the hands-on preparations that are part of being on a Mid Pac project team, Michael's role making arrangements for the overall conference has its own rewards. "I hand-picked the judges, I reached out to different companies," said Michael. "Providing this experience to the students and hearing them participate makes me happy; I know they're working hard."

GEO WALL COMPETITION

Going into his third Mid Pac competition, Jared Norris has learned some lessons and feels optimistic about the small team he's leading to compete in Geo Wall.

"Compared to last year, it's a little more difficult," said Jared of the problem the team must solve with a container of soil and a retaining wall. "There's more pressure on the wall than there was before. Last year's competition was just to design a retaining wall and if it holds, then you place a surcharge load on the soil itself. This year is almost identical but we added two cantilevers." A 50-pound bucket hanging from the cantilevers, combined with another 50-pound bucket on top of the soil, creates more stress on the retaining wall.

"We have a completely new, inexperienced team," said Jared. "But I'm very impressed with how our team has been doing. With a little more practice we'll be in competition shape very soon."

As he acknowledged that students focused on water resources engineering, as he is, typically choose to work on the Concrete Canoe or Water Treatment teams, Jared says, "I've only done Geo Wall. I like the atmosphere of it and how we're a tight-knit group."

STEEL BRIDGE

As a second-time Steel Bridge team captain, Nathaniel Wilson manages a team of about 15 builders who dedicate a chunk of their weekends to preparing for the Steel Bridge competition.

He says the team is struggling past some initial hurdles but he expects things to improve. "We've been calling for all hands on deck to hopefully finish fabrication by the end of March," says Nathaniel. "Then it will be strictly build practice and retrofits. Our progress has fallen behind our original timeline, but I'm hoping that grinding away during spring break, we'll be able to catch up."

WATER TREATMENT

The team tackling the Mid Pac Water Treatment problem faces a scenario of being caught off guard by a storm during a tropical getaway, necessitating the creation of a water treatment system. The materials allowed as constituents in the water include powdered Kool-Aid mix, pineapple juice, yogurt and African violet potting mix.

Project Manager Oscar Velez is participating in Mid Pac for the second year, and says many of last year's team members returned, along with five new members. "Our team has been meeting off campus to practice on the model we will be competing with," said Oscar. "I've also been receiving assistance from the previous Water Treatment Project Manager."

He has no doubt that the team will improve on its performance at last year's Mid Pac. Plus, the natural limitations of having to travel to a remote location are eliminated this year: "Considering that we will be hosting, that will make it much easier for the members to be a part of the competition and participate," said Oscar.

MAJOR DONATION FROM CLARK PACIFIC

Rounds Out Concrete Lab Renovation Funding

A multiyear initiative to upgrade all the labs used by students in the College of Engineering and Computer Science has received a hefty boost from Clark Pacific in the form of a $200,000 donation.

Clark Pacific is a locally based firm that specializes in producing precast concrete used for architectural and structural components in state-of-the art prefabricated building systems. Their portfolio includes Apple Park, the largest prefabricated concrete building in the world, Golden 1 Center, and the San Diego International Airport parking structure. They are also currently completing the new Parking Structure V on the Sacramento State campus.

"Clark Pacific has always been an incredible supporter of the department," said Civil Engineering Department Chair Dr. Benjamin Fell. "They're always willing to help students, especially with Concrete Canoe. They come to all our events; they're very active."

Professor Eric Matsumoto, who specializes in precast concrete, added, "Clark Pacific has also supported our precast seismic connection research and regularly supports our students in the annual Precast/Prestressed Concrete Institute (PCI) Big Beam competition, providing a unique opportunity for hands-on fabrication of a pretensioned beam at their plant. They also participate in our PCI Student Club and concrete classes as guest speakers, and not surprisingly, they like to hire our students!"

Upgrading the concrete lab is part of the college's $10 million investment in renovating and enhancing all its laboratories. For the concrete lab, in particular, renovations and new equipment will allow students to expand research with innovative concrete such as high-strength concrete, and fabricate and test precast, prestressed structural elements.

Vital upgrades needed for the concrete lab amount to approximately $560,000, of which the university has already funded more than $361,000. The $200,000 from Clark Pacific will provide state-of-the-art concrete fabrication and testing equipment, and rounds out the total renovation cost.

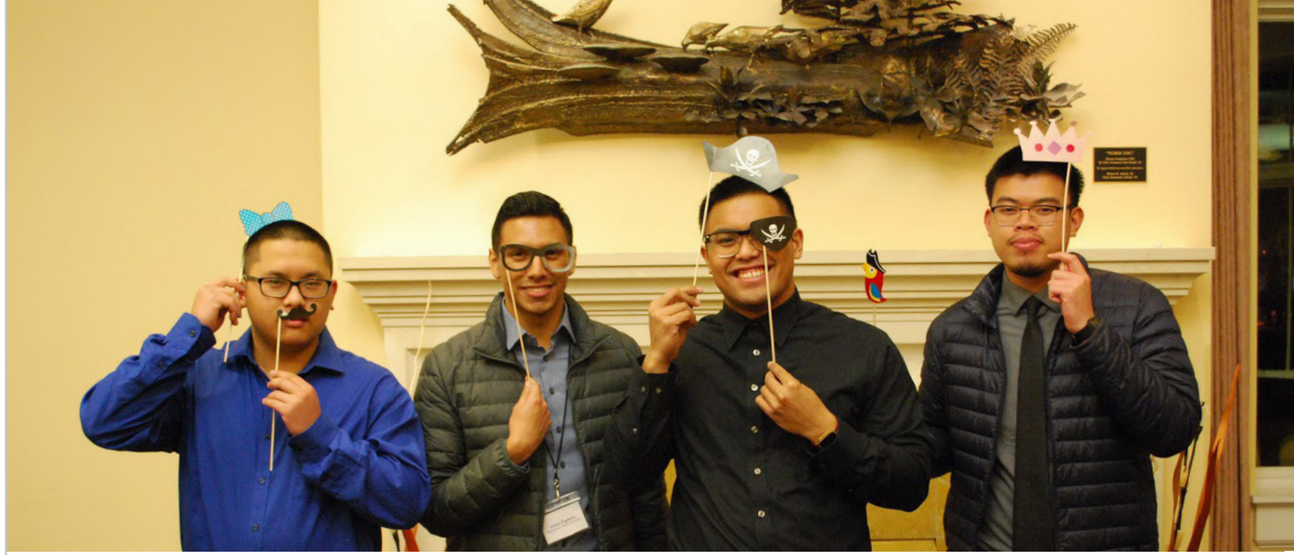
The concrete lab, which resides in Santa Clara Hall, won't change in size but will soon include a digital control system, racks for the curing room, benchtop workstations for students, high-strength rebar testing equipment, prestressing equipment, and mixers. The upgrades are expected to be complete by 2022.

"This naming gives Clark Pacific more prominence on campus, so our students realize there is an opportunity to work for a great local company on large structural projects," said Dr. Fell, speaking about the firm's name on the lab signage. "Having these discretionary funds to spend on updating the lab allows us to provide better learning opportunities to students. It's a win-win from Clark Pacific's and our perspective."

ITE STUDENT LEADERSHIP SUMMIT

Well Worth the Long Drive to Oregon

This year's Western District Student Leadership Summit for student chapters of the Institute of Transportation Engineers (ITE) took place in January at Oregon State University, and four Sacramento State Civil Engineering students were there to take it all in.



"We created a timeline – because engineers love timelines – that told the story of how an engineering student can improve professionalism with the help of ITE…"
— Andy Espinoza

After an eight-hour drive, students Michael Almazan, Myron Phouaypha, Devin Nguyen and Andy Espinoza were glad to be greeted with the first task: a bowling night with the other summit attendees. The next day, the summit featured presentations from professors and transportation engineers from the industry, as well as networking opportunities.

"Professors showcased their research on pavement design or traffic analysis with transit," said Michael, who is president of the Sacramento State ITE student chapter. "Professional members were there to network, guide and mentor. Then we had a competition where the first day we created posters highlighting student development, ITE fundraising or public outreach, and the top-voted groups presented them to the judges on Sunday morning."

The approximately 120 student attendees – representing 40 universities – were randomly grouped with peers and given a poster and a topic. The Sacramento State students ended up in separate groups with people they didn't know. "It forced us to network," said Michael.

"Our group's topic was about how ITE helps student members with professional development," said Andy, treasurer of the ITE campus chapter. "We got advice from some of the professionals to outline a few categories on our poster. We took their advice and came up with five ways ITE helps students with professional development: mentorship, collaboration, networking, communication and leadership."

Andy's group was one of eight that were voted to present their posters and ideas to a panel of professional engineers. "We created a timeline – because engineers love timelines – that told the story of how an engineering student can improve professionalism with the help of ITE," he said. "With five students in our group, each of us chose a topic and spoke about how it related back to our personal experiences with ITE."

To their surprise, later that day Andy's group was chosen by the judges to win first place in the competition. The judges provided positive feedback about the students sharing their experiences, and said they had spoken clearly and professionally. "One of the things I want to improve is my ability to speak in front of a room full of people, so this allowed me to practice," said Andy.

For Michael, the summit was beneficial in another way: "The networking was extremely valuable," he said. "It helped out with my other jobs like coordination of the ASCE [Mid Pac] competition for transportation. Getting advice from professionals was extremely helpful."

"The presentations were all great; some were really informative, some were funny," recalls Andy. But perhaps most importantly, "Every student seemed to be having fun."

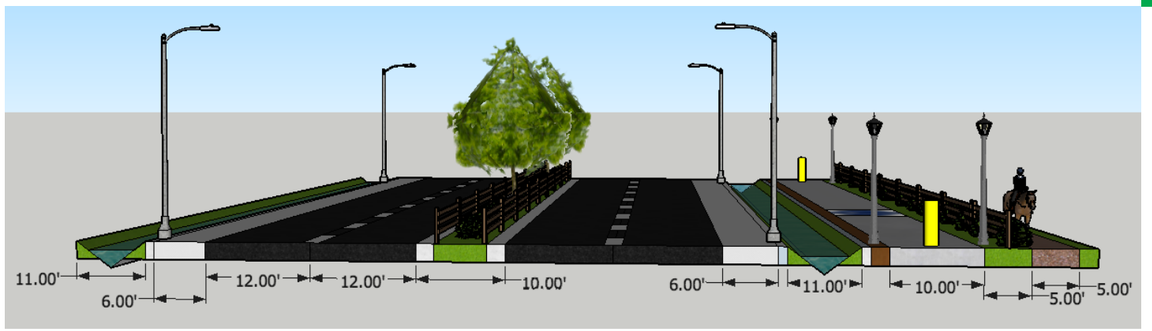
Students Present

REAL-LIFE SOLUTION

to CE 190 Problem at Capital SouthEast Connector JPA Board Meeting

Last semester's CE 190 students were assigned a problem from a section of the Capital SouthEast Connector for their final project, giving them a taste of real-life engineering quandaries they had to solve and present before an audience of their peers, instructors and professional advisors.

One of the CE 190 student groups also presented its findings and solution to the actual board of directors for the Joint Powers Authority (JPA) that manages the Capital SouthEast Connector project. On Dec. 8, 2017, the group of six students (who all graduated later that month) were joined by CE 190 Professor Dr. Matt Salveson, PE, at Rancho Cordova City Hall, where the JPA board meets.



"…as soon as one person makes a decision in their design, it could change someone else's. The number one takeaway was that engineering design is a team sport."

— Cortney Zellman Grubbs

"The JPA connector is going to be an expressway that connects I-5 and south Sacramento out to Highway 50 in El Dorado Hills," said Cortney Zellman Grubbs, a member of the student group that presented at the board meeting. "Our group was assigned a small subsection along Grant Line Road through the town of Sheldon in Elk Grove. Our primary goal was to create a four-lane roadway – two in each direction – and a multi-use path for equestrians, bicyclists and pedestrians, with pavement design, drainage design and all that entails."

Over the course of the semester, the students learned the pitfalls of a real-life, massive-scale project. "Considerations included right-of-way, rural aesthetics, accessibility, safety and environmental considerations," said Dr. Salveson as he introduced the student group to the JPA board members. "The students had to use all the elements of their engineering training and synthesize a solution to a complex problem."

"Finding information about the project constraints – I think that's a real-world example that a lot of engineers run into on a daily basis, and I felt that was one of the hardest parts," said Naira Contreras, another member of the student group. "Professor Salveson designates professional engineers who volunteer their time to be an advisor, acting as our client. We also had a technical mentor who was very helpful in providing information or guiding us where to look. These mentors were Sacramento State graduates."

Another major factor students had to face was the pushback from residents unhappy with the increase in the speed and quantity of traffic, not to mention property owners affected by eminent domain. As Dr. Salveson told the board, the CE 190 project was "politically sensitive, which makes for a fantastic exercise!"

"In the real world, which this is supposed to portray, you always have competing demands and interests from the public but also the owner of the project, who's paying for it," said Cortney. "Most of the time their views are not the same. That was the case with this project."

The JPA provided the students with actual comments and complaints received during community workshops, so they used them to inform their design approach. The student group competently addressed the JPA board the day after giving their CE 190 final presentations at Sacramento State to an audience of their peers, faculty and industry.

"Each of us took a portion to manage, such as drainage or pavement design," said Cortney. "But everything depends on everything else, so as soon as one person makes a decision in their design, it could change someone else's. The number one takeaway was that engineering design is a team sport."

RIC REINHARDT

Trust your gut. Read the writing on the wall. Stay a few steps ahead of the crowd. Looking at the path Ric Reinhardt's career has taken so far, his approach might be distilled down to these nuggets of wisdom, and they've served him well.

ALUMNI Spotlight

As a Principal Engineer at MBK Engineers in Sacramento, Ric ('96, MS '98) focuses on planning, design and implementation of flood management projects. He's been with the firm since 2000, and currently serves on its board of directors.

"Our business model is built around serving the water resource needs of the Central Valley, Oregon and Nevada. We have a mix of both urban and rural/agricultural clients," says Ric. "We do district engineering work in the Delta for the reclamation districts; reservoir modeling – both flood control and water supply and water rights. We're very proud that our firm has been able to sustain the business since 1960. The foundation of our success is our employees. We strive to maintain a culture where people want to spend their career."

Even though Ric knew as a teenager that he wanted to be an engineer, he followed in his father's military footsteps and enlisted in the Navy after high school, serving for four years before starting college. "I was a boiler technician," he says. "It was hard labor for long hours under extreme conditions. It provided the structure I needed to mature and taught me the importance of discipline. It also reinforced that I didn't want to do manual labor all my life. Since I already knew I wanted to be a civil engineer, when I got out of the service I was very focused and understood the value of completing my education."

As an undergraduate student assistant, Ric cut his teeth working for the U.S. Army Corps of Engineers. "I felt it was very important to graduate with experience to make myself more employable," he said. Upon graduation, the Army Corps hired him full-time and he stayed there for four more years, working his way up to Senior Project Planner.

"I started out with an interest in hazardous waste remediation," says Ric. "I was interested in the work, but what caught my attention was the large sums of money being spent on remediation in the 1980s and 90s. I questioned whether society would continue to invest in remediation at that level and what the future might hold for that field. An opportunity came up to work in flood management in the Corps' civil works program, and I decided to pursue it. In California you know there are always going to be water issues: either too much or not enough. It looked like secure employment, and I found passion in it."

Now solidly entrenched at MBK, Ric has been in the field long enough to have worked on significant projects, such as the Napa River Flood Control Project, a variety of Flood Management Projects for the Sacramento and West Sacramento Area Flood Control Agencies and the Three Rivers Levee Improvement Authority.

"…I feel I owe Sac State a lot for positioning me for a successful career, so I've chosen to be active. It's my way of giving back, so they can help future generations of civil engineers."

— Ric Reinhardt

"I'm excited to be a part of a flood management community that has moved from trying to control and constrain rivers to looking at opportunities to reduce flood risk in ways that also enhance and restore the environment," says Ric.

Pointing out recent years' major investments in levees that protect Sacramento, West Sacramento, Yuba City and Marysville, Ric recalls that Yuba County suffered from devastating floods in 1986 and 1997.

"Those floods resulted in loss of life and huge economic losses for that community," said Ric. "We've seen that where levee failures occur, the economy never fully recovers. People and businesses move out and don't come back. We're just completing a program of levee improvements that has invested approximately $550 million in the Yuba County levee systems, which will meet both FEMA's 100-year [flood protection] criteria and the state of California's [200-year] Urban Level of Protection criteria. A lot of communities are improving, but it's great to see an economically disadvantaged community at the forefront of reducing flood risk."

Nevertheless, Ric describes an uphill battle some of his clients (such as flood control associations or chambers of commerce) face trying to convince federal and state lawmakers to allocate funding for needed levee maintenance and repairs when they're competing with other demands like social services programs. "With climate change and sea level rise, we're looking at greater threats to levee systems than in the past," he says. "We know these things are occurring and if we had a large flood event, experts will look not at what we did right, but what we did wrong. That keeps me up at night."

As he looks to problems facing the next generation of engineers, Ric has devoted significant energy to Sacramento State through his longstanding memberships on the university's Environmental Water Resources Engineering Graduate Program Advisory Committee and the College of Engineering and Computer Science's Industrial Advisory Committee.

"I met my wife here; she's a Sac State grad," Ric says. "and I feel I owe Sac State a lot for positioning me for a successful career, so I've chosen to be active. It's my way of giving back, so they can help future generations of civil engineers."

Ric's own 14-year-old daughter has aspirations to become an engineer, and he's proud that his 16-year-old son is interested in military service. Ric hopes to increase his own role serving the community by continuing to advocate for flood management funding, and he'll continue to be a frequent presence supporting the Civil Engineering Department at Sac State.

"We're seeing a much more diverse student body from the civil engineering program," said Ric. "Students are preparing for where the industry is going, not where it's been. I like the direction Sac State is taking. There's a strong emphasis on connecting to the community and that's something I can buy into. I want to see Sac State successful."

N&N News & Notes

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— Dr. Khan

Faculty

Dr. Ghazan Khan received the Jonathan Burdette Brown Education Award from the Sacramento Section of the American Society of Civil Engineers. It was one of several prestigious awards the organization presented at an Individual Awards & Officer Installation Dinner last fall.

Unbeknownst to Dr. Khan, Civil Engineering Department Chair Dr. Benjamin Fell nominated him for the award.

"He's been very active in pursuing opportunities that allow him to redesign his courses," said Dr. Fell. "He's made new courses that are very well-received by students. Their comments on the class evaluations show they appreciate his teaching style. [Seeing] his compassion for his students and enthusiasm for the topics, and the evaluations and his involvement, it was an easy nomination to make."

For his part, Dr. Khan was humbled, but happily surprised to receive this honor. "When I look at past recipients of the award – Cyrus Aryani, Matt Salveson – these are people who've been my mentors since I joined Sac State," said Dr. Khan. "I've looked up to them as educators, so to be a recipient of this award alongside them was completely unexpected.

"It's also a moment of pride in the success of our students," he added. "Everything I've earned has been because of the work they've done, the effort they put into classes and student competitions – it's their efforts that have resulted in me being given this award."

Alumni

2012

Adam Killinger, PE, GE (MS '12) had several years of private sector experience as a consulting engineer under his belt by the time he enrolled in the Master of Science program at Sac State (his bachelor's degree is from California State University, Chico). Now a licensed civil engineer and geotechnical engineer in the state of California, Adam practices in geotech and is currently the Northern California Region Engineer for Geopier. He also serves as the ASCE Sacramento Section President.

2009

Deana Donohue, PE (MS '09), is owner of her own firm, Myriad Engineering, where she specializes in water system analysis and infrastructure design. Deana has more than 20 years of engineering experience, having worked as a consultant and for an investor-owned water utility where she served as Northern California Engineering Manager, Operations Manager and Vice President of Engineering. Deana has worked on major projects designing water and sewer pipeline and hydraulic facilities in the greater Sacramento area. "I attended Sacramento State to complete a personal goal of achieving a Master of Science Degree in Civil Engineering," says Deana, who earned her Bachelor of Science in Civil Engineering from San Jose State University. "I had already completed 10 years in the professional field. I not only achieved my goal of receiving my MS degree, I was also able to share my real-world experience for the benefit of my classmates. I would be remiss if I didn't mention the outstanding staff who assisted me with my goal but also had great understanding of the challenges of balancing full-time work with the demands of attending an MS program."

1999

Jon Money, PE ('99, MBA '09), started his "dream position" this past May working as a Senior Engineer at the El Dorado Irrigation District, where he manages multiple projects within their water, wastewater, recycled water and hydro power divisions. Previously, he served the Sacramento County Department of Water Resources from 2005-2017, most recently for the County Engineering Section where he worked on the administration of countywide financing and Mello Roos districts. Jon gave back to Sacramento State by teaching the Friday afternoon survey lab from 2007-2013. In addition to his Sacramento State degrees, Jon earned a master's degree in Civil Engineering from UC Davis in 2006. "One of my best experiences as a student at Sac State was participating in the Concrete Canoe National Competition through the student chapter of ASCE," says Jon. "By participating and giving it my all, I was part of a team that qualified for nationals twice and I was given opportunities to network with peers, test the principles learned in class, land my first job, and – most importantly – meet my super awesome wife, Becky."

1991

After graduation, **Mark Rayback, PE** ('91), joined Caltrans and remained there for the next 15 years, including as Chief Environmental Engineer and Caltrans Chief of Staff. He served on Governor Schwarzenegger's California Performance Review team. In 2005 he began working at Wood Rodgers, where he now serves as Vice President of the Transportation Department and serves on the firm's board of directors. "I really enjoyed my time at Sac State," says Mark. "It prepared me both technically and socially for a great career in Civil Engineering."

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