

CAL POLY
SAN LUIS OBISPO

ARCE

ARCHITECTURAL ENGINEERING DEPARTMENT | COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN | SPRING 2013

STUDENT PROJECTS IN
PERSPECTIVE



Inside

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On The Cover

Evan Gerbo was on a team of ARCE and civil engineering students that designed an iconic commercial office building for the 2013 Earthquake Engineering Research Institute's Undergraduate Seismic Design Competition. Read about students' other achievements on page 9.



Al Estes

ARCE DAZZLES, THANKS TO YOU

As this busy year comes to an end, I am pleased to share our activities and accomplishments in our annual magazine. From the curricular standpoint, we are challenged with reducing the number of units in the program, welcoming our largest freshman class to date, and offering a non-thesis option for the master's program. Our accomplishments include winning two national competitions, continuing to upgrade our facilities, and conducting some very interesting and innovative faculty research.

In addition to the faculty, staff and students, I have many to thank for our continued success. My thanks to Nucor Corp. for sponsoring this magazine. The Concrete Masonry Association of California and Nevada (CMACN) is sponsoring our Masonry Design course. K'NEX Corp. donated more than 44,000 rods and connectors for classroom use. RISA Technologies and Computers and Structures Inc. donated the software we use. We appreciate Jack Berridge, who traveled here with his family to dedicate the Berridge Lab and be our college's honored alumnus. We continue to grow the Learn by Doing Parents Fund sponsored and matched by Florian and Lori Barth. Thanks to our lab sponsors (CSI, Hilti, Simpson Strong-Tie, Verco, Degenkolb, and Mark Haselton), to Fluor for supporting the Student Leadership Fund, and to Jerry Lohr for his annual contribution of wine. I appreciate all of you who have contributed to scholarships, attended Structural Forum, and served on the Advisory Board. We have continued to stay in touch with you all through field trips, ARCE receptions at the SEAOC convention and Parents Weekend, Open House, alumni get-togethers, and personal visits. We are happy to welcome Christine Theodoropoulos as our new dean. She provides a great complement to our new provost, president and chancellor.

ALLEN C. ESTES, DEPARTMENT HEAD

Dean's Message

EXCELLENT, AND GETTING BETTER

As my first academic year at Cal Poly winds down, I pause to reflect on how proud I am to be the dean of this prestigious college. My first months have been a whirlwind of meeting people, managing budgets, preparing for a capital campaign, understanding curricula, and promoting interdisciplinary collaboration. We have such a diverse array of disciplines in this college that our opportunities are endless.

ARCE is one of the few ABET- (Accreditation Board for Engineering and Technology) accredited engineering programs in the nation housed outside a college of engineering. The practitioners on the faculty and the depth of curricular coverage in structural engineering set the program apart. I praise their accomplishments and look forward to the continued update of facilities and laboratory equipment.

My thanks to those parents, alumni, industry partners and friends who have already contributed so generously to this program's success.

CHRISTINE THEODOROPoulos, AIA, PE, DEAN



Cal Poly President Jeffrey D. Armstrong

A VERY SPECIAL HOMECOMING

JACK BERRIDGE RETURNS TO HONORED ALUM TITLE, NEW LAB AND FOOTBALL

Alumnus Jack Berridge (ARCE '59) had quite the homecoming in October 2012.

Selected as the College of Architecture and Environmental Design's 2012 Honored Alumnus, Jack, together with family members and friends, traveled to San Luis Obispo from San Antonio, Texas, to celebrate with all of the 2012 Cal Poly Honored Alumni and distinguished guests at an awards and dinner reception held during Homecoming.

Festivities included an invitation from Cal Poly President Jeffrey D. Armstrong to be his guest in the President's Box to watch the Mustang football game on Oct. 20. Jack was recognized for his accomplishments during halftime.

Jack, founder and owner of Houston-based Berridge Manufacturing Co., is well known as an innovator of architectural metal roofing products and is considered a pioneer of the architectural metal panel industry. Jack was the first person to sponsor an ARCE experimental laboratory. The Berridge Lab is the seventh lab to undergo renovations as part of a program that provides opportunities for companies and individuals to make a \$10,000-a-year commitment for five years to pay for upgrades and renovation.



Thanks to Jack's generosity, the ARCE Department celebrated the opening of the Berridge Manufacturing Co. Materials Testing Laboratory. Jack gathered with family, faculty members, students and friends at the dedication ceremony, also held during Homecoming weekend. The ceremony featured a ribbon cutting, plaque unveiling and cake cutting, followed by a lunch for students and guests, including President Armstrong and College of Architecture and Environmental Design Dean Christine Theodoropoulos.

The lab, previously the Materials Testing Laboratory, gives architecture,

Jack Berridge and Nancy Hagman joined ARCE students, faculty and staff for the dedication of the Berridge Manufacturing Lab during Homecoming weekend last fall.

architectural engineering, and construction management students their first real exposure to structural courses.

Jack donated the labor as well as his company's siding products to cover the bare concrete walls. The remodel will also include new furniture, carpet, a projector system, white boards and supplies.



MIXING IT UP

2012 SEAOC CONVENTION AND ARCE RECEPTION EDUCATE AND ENTERTAIN FACULTY, STUDENTS AND ALUMNI

The ARCE Department had quite a presence at the 2012 Structural Engineers Association of California (SEAOC) Convention in Santa Fe, N.M., in September. Three faculty members presented papers and four students attended the annual event.

Jim Guthrie presented a paper co-authored by Jill Nelson on the CALVIVA project, which assesses California state buildings for their seismic vulnerability, James Mwangi presented a paper on the Haiti rebuilding effort, and John Lawson presented a paper on roof drainage issues affecting engineers.

Students Alex Daddow, Andrew Jimenez, Beth Schlacks and Lauren Litwiler were able to attend the conference, thanks to donations from Bill Warren (ARCE '78) and Larry Kaprielan (ARCE '79). Funds from the ARCE Parents Learn by Doing

Fund and the university's Instructionally Related Activities program also helped fund the students' trip to Santa Fe.

The students, all officers in Cal Poly's SEAOC student chapter, attended technical sessions and social events and went on a field trip with John Lawson to Santa Fe's Loretto Chapel, where they saw firsthand the unique 22-foot-tall wood helical staircase that makes two complete rotations with no central support.

In what has become a much-anticipated tradition during the annual four-day SEAOC Convention, the ARCE Department hosted another successful alumni/friends reception. Held at the Cowgirl BBQ, the event attracted about 55 alumni and friends. "It's great having seasoned professionals meet and interact with our students," John said.

The department also thanks Ashraf

Attending the CSI Reception at the Santa Fe SEAOC Convention (from left): Lauren Litwiler, James Mwangi, Ashraf Habibullah, a guest (name unknown), Beth Schlacks and John Lawson

Habibullah, CEO of Computers and Structures Inc., for inviting the students to his gala reception held at the world-renowned Gerald Peters Gallery that he rented for the evening. Guests were treated to dinner and flamenco music and dancing.

"People were dancing to flamenco music next to artwork worth hundreds of thousands of dollars," John said. "The students were blown away."

This year's Alumni and Friends Reception will be held at the SEAOC Convention in San Diego. Come visit with friends on Thursday, Sept. 19! Look for details to come at www.arce.calpoly.edu.

MOMENTUM

SUPPORT GROWS FOR ARCE PARENTS FUND

When Florian and Lori Barth established the ARCE Parents Learn by Doing Fund in 2012, they envisioned it as a "challenge" grant that would encourage other parents to invest in enhancing the educational experience of students. The Barths will match, dollar for dollar, each gift made to the fund, up to \$50,000.

The fund will bring physical demonstrations into the classroom, provide more hands-on learning experiences, send students to competitions and conferences, and foster activities that connect their education to the design industry and the real world.

It has already helped send four students to the 2012 SEAOC Convention

in Santa Fe (see story on opposite page), upgrade the new seismic lab, support guest speakers, welcome freshmen, and buy testing equipment.

Please consider making a contribution to the fund's ultimate goal of \$100,000 using the enclosed envelope. The students will long benefit from your generosity.

\$50,000

\$46,000

\$42,000

\$38,000

\$34,000

\$30,000

\$26,000

\$22,000

\$18,000

\$14,000

\$10,000

\$19,035



WELCOMING ARCE'S PARENTS

For the third annual Parents Weekend, the ARCE Department added a second event: a wine (donated by J. Lohr Vineyards) and cheese reception that attracted more than 80 people on Friday, Oct. 12.

Faculty member Ed Saliklis and his band, Professor S and The Stress, thrilled the crowd with their No.1 hit song, "I've Got the ARCE Blues." (Visit Youtube at: www.youtube.com/watch?v=o7wcIN8mXAc&feature=related.) Ed also gave a presentation on Myron Goldsmith and the development of braced tubular frames.

On Saturday the department hosted a lunch reception for about 120 parents. College of Architecture and Environmental Design Dean Christine Theodoropoulos provided welcoming remarks, while the SEAOC student chapter prepared tri-tip sandwiches, complete with salad and chips.

The students gave presentations on SEAOC student chapter activities and on their recent trip to Haiti.

Guests were also introduced to the ARCE Parents Learn by Doing Fund through a video created by Florian and Lori Barth, who established the gift but



Professor S and The Stress entertain guests (top), and student Daniel Burkhartsmeier welcomes his parents (above).

were unable to attend in person. (See story at left.) ARCE parents Ken (B.Arch '80) and Jeanne Stone graciously volunteered to explain the importance of contributing to this matching program.

Department Head Al Estes gave an update on department activities and took questions. (To see a brief recap of the events, watch our video: www.youtube.com/watch?v=JX8Mq7CrGO8&feature=plcp.)

Watch for information on the next ARCE Parents Weekend festivities, planned for Oct. 25-26, 2013, to coincide with the university's Parent and Family Weekend. The department will welcome new students and families on Tuesday, Sept. 17, 2013, as students move on to campus. Look for more information on our Facebook page and at <http://www.arce.calpoly.edu/>.



Gathering for the forum (from left): Neville Mathias, Bruce Danziger, Ed Saliklis, John Lawson, CJ Horn, Al Estes, Ricky Stewart, Lauren Litwiler, Andrew Jimenez, Ethan Meier, Martin Bechtold and Nancy Hamilton

STRUCTURAL FORUM 2013

'STRUCTURAL EXPRESSIONS'

Four dynamic speakers – all highly regarded leaders in their fields – helped make the 23rd annual Structural Forum a success, drawing an even bigger student audience than last year.

This year about 130 students, including several civil engineering students, came to campus Saturday, Feb. 2, to hear presentations by Nancy Hamilton, director of Engineering Services at HOK; Martin Bechtold, professor of architectural technology at Harvard Graduate School of Design; and Neville Mathias, associate director and senior structural engineer at Skidmore, Owings and Merrill (SOM) in San Francisco.

Capitalizing on the forum's theme, "Structural Expressions," Nancy's presentation was titled "Integration of Structure and Architecture: Case Studies."

Martin spoke on "Fabricating Structures." He founded the Design Robotics Group at Harvard, which focuses on integrating robotic technology into fabrication and construction processes.

Neville presented "Sculpting Structure: The Al Hamra Tower," the tallest skyscraper

in Kuwait City, Kuwait. Designed by SOM, the 1,354-foot tower was completed in 2011 and is the tallest sculpted tower in the world.

In the evening, the students gathered at the Embassy Suites hotel in San Luis Obispo to meet with representatives from 29 prominent industry firms at a career fair and an evening banquet. Participating companies fund this annual event by sponsoring tables. The funds support Cal Poly's student chapter of SEAOC.

Banquet keynote speaker Bruce Danziger spoke on "Aspirations to Design." Bruce, an associate principal with ARUP in Los Angeles, has been the lead structural engineer for several performing arts centers and other cultural venues.

ARCE senior and Structural Forum Chair Lauren Litwiler organized the event – from conceptualizing the etched glass centerpieces to approving contracts with Embassy Suites and narrowing down the list of speakers. "It was a lot of work," she said, "but I'd do it again. It was fun to communicate with people outside the department."

THANK YOU, PARTNERS

The ARCE Department thanks the following companies for their attendance and support of this year's forum:

ARUP
Barrish Pelham & Associates Inc.
Brooks Ransom Associates
Buehler & Buehler Structural Engineers Inc.
Crosby Group
DCI Engineers
Degenkolb Engineers
DES Architects + Engineers
Englekirk Structural Engineers
Ficcadenti Waggoner & Castle
Structural Engineers
Forell / Elsesser Engineers Inc.
Hilti Corporation
Holmes Culley
Hope - Amundson Structural Engineers
John A. Martin & Associates
KNA Consulting Engineers Inc.
KPFF Consulting Engineers
Lionakis
MHP Structural Engineers
Miyamoto International
Nishkian Menninger
Rutherford + Chekene
SidePlate Systems Inc.
Simpson Strong-Tie Co. Inc.
Summit Engineering
Taylor & Syfan Consulting Engineers Inc.
Wiss, Janney, Elstner Associates Inc.
ZFA Structural Engineers



ARCE SENIORS CELEBRATE

The annual Senior Banquet is an important event, says Department Head Al Estes. “ARCE students have worked incredibly hard, developed friendships, and grown personally during their years at Cal Poly. The Senior Banquet is a final opportunity to pause, reflect and celebrate those milestones.” Organized by students CJ Horn and Garrett McElveny, this year’s banquet was held at Guiseppe’s in Pismo Beach. The evening featured some awards, presentation of senior gifts, and a student parody of the faculty.



Celebrating seniors (from left): Beth Schlacks, Heather Isobe, Butian (Tom) Liu, Meghan Navarro, Shawna Peterson and Sonia Huynh

KUDOS!

HONORING ARCE'S 2012-13 SCHOLARSHIP RECIPIENTS

Every June those scholarships established by our generous donors are awarded to a group of talented and deserving ARCE students. The department hosts a luncheon during the final week of school to formally present these scholarships. The luncheon precedes the annual Projects Day presentations. Congratulations to these worthy recipients, and thank you to our donors!

Below: CAED Dean Christine Theodoropoulos, scholarship recipient Nicole O'Hearne, and Associate Dean Dick Zweifel

2012 COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN AWARDS AND SCHOLARSHIPS

Ethan Meier | Douglas James Martin Scholarship
Sunny Bruns & Sinhui Chang | Herbert E. Collins Scholarships (Undergrad)
Chase Kossack & Shahab Shaolian | Herbert E. Collins Scholarships (Master's)
Matthew Kidd | Robin L. Rossi Award
Nicole O'Hearne | CAED Jamba Juice Scholarship
Shawna Peterson | Carson Starkey Memorial Scholarship for Merit
Sinhui Chang | Cal Poly Certificate of Excellence for Community Service
Lisa Henry | Cal Poly Certificate of Excellence for Advancing the Image of the CAED

2012 ARCHITECTURAL ENGINEERING DEPARTMENT AWARDS AND SCHOLARSHIPS

Chandler Morehardt | Emanuele Barelli Structural Engineer Scholarship
EERI Seismic Design Competition: Brian Biehl, Stephen Coan & Jennifer Roth | KNA Senior Project Grant
Sinhui Chang | Englekirk & Sabol Consulting Structural Engineers Scholarship
Jesse Hoyer | Forell Elsesser Engineers Scholarship
Sunny Bruns & Sinhui Chang | Hans Mager Scholarship
Nicole O'Hearne | Fluor Lower Division Scholarship
Lauren Litwiler | Fluor Upper Division Scholarship
Telescope Group: Mounir El-Koussa, Laura Rice & Michael Vickery | CYS Eugene Cole Senior Project Award
Shawna Peterson | John A. Martin and Associates Scholarship
Kevin Miller | KPFF Consulting Engineers Scholarship
Christopher (CJ) Horn | Simpson Gumpertz & Heger Inc. Scholarship
Christopher (CJ) Horn | Degenkolb Engineers Scholarship & Internship
Zhilong Liu | SEAOSC Scholarship

2013 COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN AWARDS AND SCHOLARSHIPS

Jorge Gonzalez and Martin Chavez | Herbert E. Collins Scholarships (Undergrad)
Khloe Campos and Sinhui Chang | Herbert E. Collins Scholarships (Master's)
Daniel Morosan | Robin L. Rossi Award
Joaquin Bermudez | CAED Jamba Juice Scholarship
Nicole O'Hearne | Carson Starkey Memorial Scholarship for Merit

2013 ARCHITECTURAL ENGINEERING DEPARTMENT AWARDS AND SCHOLARSHIPS

Andrew Stephens | Emanuele Barelli Structural Engineer Scholarship
Same Polytechnic College in Tanzania: Daniel Stone, Lauren Litwiler, Meghan Navarro, Sonia Huynh and Katie Schwall | KNA Senior Project Grant
Kendall Johnson | Englekirk & Sabol Consulting Structural Engineers Scholarship
Kevin Choy | Forell Elsesser Engineers Scholarship
Nicole O'Hearne and Simon Jardel-Menno | Hans Mager Scholarship
Noradelli Villanueva | Fluor Lower Division Scholarship
Matthew Kidd | Fluor Upper Division Scholarship
SESH (Haiti): Alex Daddow and Andrew Jimenez | CYS Eugene Cole Senior Project Award
Shawna Peterson and Jesse Hoyer | John A. Martin and Associates Scholarship
Joaquin Bermudez | KPFF Consulting Engineers Scholarship
Nicole O'Hearne | Simpson Gumpertz & Heger Inc. Scholarship
Yoshitaka Tamiya | Degenkolb Engineers Scholarship & Internship
Beth Schlacks | Concrete Masonry Assoc. of CA/NV
Nicole O'Hearne | Simpson Strong-Tie Scholarship
Andrew Jimenez | SEAONC Scholarship





COMPETITIONS HONE

REAL-WORLD SKILLS

Architectural engineering students continue to compete in competitions designed to showcase the students' real-world problem-solving skills. "This was an interesting year for competitions," says Al Estes. "We did not do as well as we had hoped at EERI or AEI, but we had surprise victories in two competitions that we had never before entered."

BROCADE COMPETITION

ARCE students made quite a mark their first time participating in the third annual Brocade Competition. Brocade, based out of San Jose, Calif., has more than 100 locations across the globe.

The project was to design an efficient, scalable and cost-effective data center for Brocade's Broomfield, Colo., campus. Teams were asked to build and design a building to support Brocade research and development and product-testing rack labs. The space required innovative ideas to lower construction and operations costs while being highly efficient in power usage effectiveness (PUE), which measures the efficiency of a computer data center (specifically how much power is used by the computing equipment in contrast to cooling and other overhead).

The project needed expertise from students in business, construction

management, architecture and mechanical, electrical, civil, architectural and environmental engineering. All teams made presentations to a Brocade panel, and the three best teams were selected to travel to San Jose for a presentation in front of a larger group.

ARCE students were on all three finalist teams. ARCE senior Kevin Miller was on the interdisciplinary team that placed first; seniors Chandler Morehardt and Andy Vallejo were on teams that took second and third, respectively. Brocade allocated \$12,000 in prize money among the three winning teams.

SEI/ASCE STUDENT STRUCTURAL DESIGN COMPETITION

Cal Poly's interdisciplinary team of architecture, construction management, landscape architecture and ARCE students took first place and won \$1,000 in the

Chandler Morehardt leads one Cal Poly Brocade team to a second place victory (top).

Cal Poly's interdisciplinary team placed first at SEI/ASCE with its Engineering Hangar Project (above).



Structural Engineering Institute's Student Structural Design Competition.

ARCE student Victor Ramos, architecture student Helene Deprez – an exchange student from Paris – and construction management major Tyler Edwards travelled to Pittsburgh in May with ARCE faculty advisor Brent Nuttall for the finals. The three finalist teams gave presentations at the SEI Structures Congress. The Cal Poly team submitted the Engineering Hangar Project, a 52,000-square-foot, state-of-the-art mechanical fabrication shop.

SKY'S THE LIMIT

RICH EXPERIENCES ABOUND FOR MEMBERS
OF SEAOC/AEI'S STUDENT CHAPTER

Holiday customs, field trips, barbecues, golf tournaments, and weekly meetings keep members of the student chapter of the Structural Engineers Association of California/Architectural Engineering Institute (SEAOC/AEI) on a tight schedule.

The group celebrated Halloween with a pumpkin-carving contest and Thanksgiving with a feast of seven turkeys and all the typical side dishes. This year they visited San Francisco, Seattle and San Diego. In San Francisco, faculty member Graham Archer accompanied the students on tours of award-winning Skidmore, Owings & Merrill (SOM), experts in high-rise towers and the firm that designed Burj Khalifa, the tallest building in the world in downtown Dubai.

In Oakland, the students visited the Cathedral of Christ the Light, also designed by SOM. "It's an amazing structure with a wooden/glass skin that creates an interior full of light," said Alex Daddow, SEAOC/AEI past-president. "One of my favorite buildings of the year."

During spring break, faculty advisor John Lawson and 15 students visited Seattle's Pike Place Market, Space Needle, Bainbridge Island, and the offices of Magnusson Klemencic Associates (MKA), DCI Engineers and KPFF, as well as PCS Structural Solutions in Tacoma.

"These firms provided access to some of Seattle's most exciting buildings and construction sites," John said. MKA's Emily Carlip (ARCE '11) gave a tour of the 76-story Columbia Center and the new Seattle Public Library.

A highlight of the Seattle trip was to the Nucor Steel Mill (*see story, page 22*), where students saw the production of reinforcing steel bars, from recycled scrap through the electric arc furnace to the finished product.

Cal Poly SEAOC/AEI chapter members Lauren Litwiler, advisor John Lawson, Ethan Meier, Daniel Burkhartsmeier, Caleb Dunne, Robyn Schmidt, and Andrew Jimenez visit the Space Needle in Seattle.





In San Diego, faculty member Peter Laursen joined the students as they visited Lovelace Engineering, Hope Engineering, and Moffatt & Nichol, plus several construction sites.

Speakers who gave presentations during the chapter's weekly meetings included:

From the ARCE Department, Al Estes, department head, gave quarterly presentations on the state of the department, and Professor John Lawson presented "The Structures Specialist's Role in Urban Search and Rescue," relating to his role as a member of a Federal Emergency Management Agency's Urban Search and Rescue task force. Carole Moore, Cal Poly Career Services, spoke on professionalism.

Lorena Arce from Hilti; Adam Azofeifa, Degenkolb; Deidra Bernal and Sandra Jung, Cushing Associates; Amber Freund, RISA Technologies; Bethany Hennings, Concrete Reinforcing Steel Institute; Damon Ho, Simpson Strong-Tie; and Doug Thompson, STB Structural Engineers, talked about their companies, career paths, projects, and personal and professional experiences.



Also, Owen Rosenbloom of Wiss, Janney, Elstner (WJE) Associates, spoke about the retrofit of the Hibernia Bank Building in San Francisco; George Grygar, TXI, talked about the applications of specialized concrete mix design and lightweight concrete; and Paul Kovach, WJE, spoke about the response to Hurricane Sandy and work done on Alcatraz.

ARCE student Alex Mueller watches as CJ Horn attempts to sink a putt in the SEAOC/AEI golf tournament (top).

SEAOC chapter members visit the offices of Holmes-Culley on their field trip to San Francisco (above).

A BELL BRINGS HOPE TO HAITI

STUDENTS REBUILD CHURCH BELL DAMAGED IN 2010 EARTHQUAKE

A job well done by the students – a newly built concrete and wood structure for the bell at St. Rose de Lima (below).

Students prepare the site and mix mortar for the concrete and rebar base (bottom).

The weather in Haiti in August is brutal. But the scorching heat and intense humidity didn't dampen the spirits of the ARCE students who traveled to the seaside village of Leogane to repair a memorial bell and tower that had been damaged in the 2010 earthquake.

Students Alex Daddow, Caleb Dunne, Andrew Jimenez, Yong (Paul) Kim, Robert Norton, Jarred Parker, Robyn Schmidt and Andrew Stephens, as well as alumnae Stephanie (Rae) Arazibal (ARCE '11) and architecture

student Hannah Pauling spent a week there in 2012. To help with engineering-related problems, Ken O'Dell, an ARCE advisory board member and vice president and partner at MHP Structural Engineers, traveled with them.

Alex was inspired by the SESH (Structural Engineering Students for Haiti) group that had gone the year before. "They came back completely changed," Alex said. "The trip seemed to have shown them the real meaning of structural engineering and why we do what we do."

More than 30,000 residents of Leogane died in the 7.0 earthquake, and the entire church for the parish of St. Rose de Lima was destroyed. "We wanted to give them a way to ring the bells again and remember their loved ones," Alex explained.

The church is being rebuilt by Haiti Engineering Inc., the nongovernmental organization that sponsored the students. Once in Leogane, the students got right to work. "The site was unprepared when we arrived, and the project was completed on time before we left," Andrew said. "It was amazing."

The students were up by 5 a.m., ready for the long day ahead. Taking just a few short meal breaks, they worked until darkness fell.

Every night the students would gather on the patio and recap their day. Alex would ask three questions: What was the favorite part of their day? The worst part? The most challenging part? "We would be out there up to two hours," Alex said. "It was funny, emotional, and we learned a lot."

The last day of construction they spent getting the screws in place, the actual cross braces connected, and the site cleared. They finished five minutes ahead of their deadline.

The next morning, Father Marat thanked the students during mass at St. Rose de Lima. After the service, a dedication ceremony was held and the bell was officially rung for 35 seconds – the duration of the earthquake. Each student also got to ring the bell once.

Community members showed their appreciation in different ways. Andrew was approached by a local man who had watched





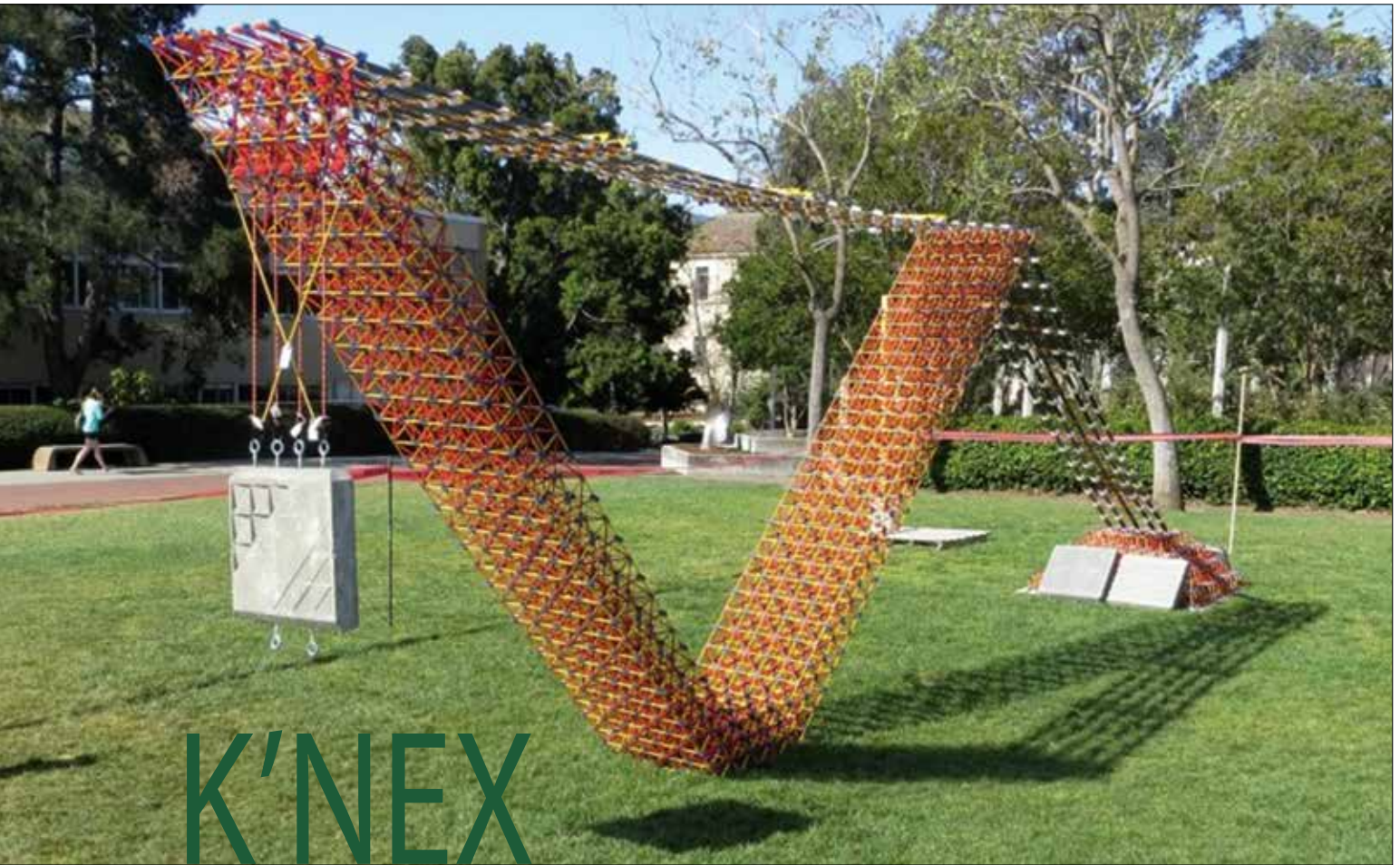
The Cal Poly team rebuilds the wood housing for the bell (above). From left: Ken O'Dell (MHP), Robyn Schmidt, Paul Kim and Caleb Dunne.

Rae Arazibal (ARCE '11) works on the concrete and rebar base (right).

them work all week. Andrew had on sandals with a broken strap. "The man asked for my sandal, and I gave it to him, thinking I'd never see him or my sandal again," Andrew said. "Lo and behold, he came back a few minutes later with my sandal fixed."

"The best part of the the trip was leading a group of 10 students through some really tough odds to build this beautiful structure for the community of Leogane," Alex said. "The climax was the opening ceremony for the memorial, in which the entire parish participated."





THEY'RE NOT JUST FOR KIDS ANYMORE

K'NEX Brands, L.P., recently donated \$10,000 worth of rods and connectors – 44,000 pieces of toy building materials – to support the ARCE's Learn by Doing activities in the classroom.

During spring quarter, students in Craig Baltimore's Large Scale Structures class used 16,000 K'NEX pieces to construct a suspension bridge that held up a 100-pound block of concrete on Dexter Lawn.

In addition, ARCE students Jesse Hoyer and Shawna Peterson are using the K'NEX pieces in support of a faculty seismic research grant awarded to Professors Cole McDaniel and Graham Archer.

Georgine Mooney and Elena Good develop their architectural engineering skills using K'NEX pieces.

A student-built K'NEX suspension bridge spans Cal Poly's Dexter Lawn (above).

This might just be the beginning of a new relationship between the toy manufacturer and the ARCE Department. Al Estes, department head, recently met with company president and CEO Michael Araten in Hatfield, Penn., to further explore the connection between K'NEX products and engineering education. K'NEX pieces are ideal for making structural models, illustrating the design-construction process and for K-12 outreach, says Al.

According to the company's website, "K'NEX is the next generation of construction sets. It inspires creativity, builds self-confidence, and encourages interaction among children and parents."

And now it seems, between college students and their professors, too. As the K'NEX website proclaims, "The possibilities are endless!"

EXCEED EXCELS IN TEACHING THE TEACHER

By all indications, the Architectural Engineering Department faculty members do exemplary work as teachers, mentors, researchers, advisors, coaches – even confidantes. So why have so many of them given up a week of their summer vacation to improve their teaching skills?

Because they care. In all, nine of 15 full-time Cal Poly ARCE faculty members have attended the ASCE (American Society of Civil Engineers) ExCEED (Excellence in Civil Engineering Education) Teaching Workshop. This intensive six-day boot camp provides engineering educators with an opportunity to improve their teaching abilities. Each year 24 participants are selected from around the country to attend.

The workshops consist of 13 group seminars, three demonstration classes by master instructors, and three practice classes by each participant that are videotaped and assessed in detail.

Cal Poly has more graduates of this program than any other school in the nation. ARCE workshop graduates include Pamalee Brady, Jim Guthrie, Peter Laursen, Al Estes, Abe Lynn, Cole McDaniel, John Lawson, Jill Nelson and Ed Saliklis. James Mwangi is attending this summer.

Ed, Abe and John performed so well that they returned to serve as faculty for successive workshops. Professor Ed Saliklis, noted, “It opened my eyes to see my lessons as a ‘product’ that must be continually improved to keep the ‘customer’ – the student – happy. Each lesson aspires to be a finely tuned and well-orchestrated event. After all, the price the customer pays per lesson is roughly equivalent to a Metropolitan Opera ticket.”

Department Head Al Estes has served as program director, senior mentor

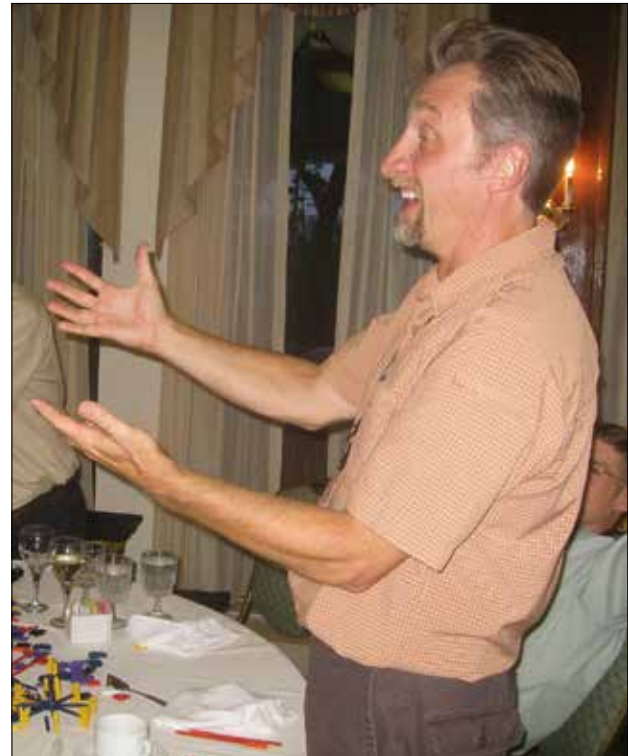
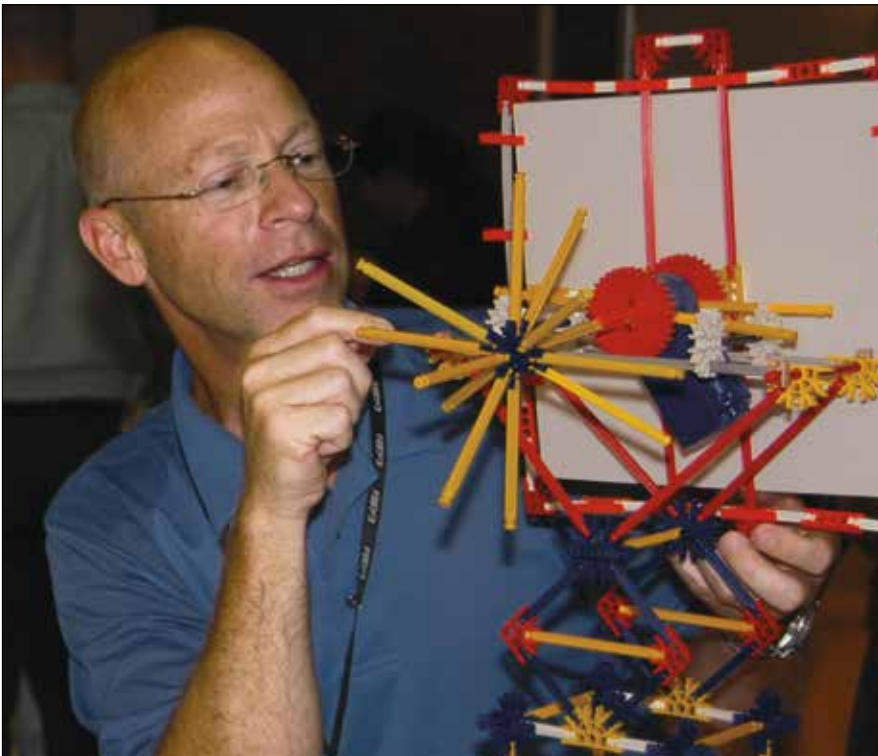
and content provider for 24 ExCEED workshops over the past 14 years. Al salutes ASCE for funding and supporting this workshop that “has 670 graduates from 228 institutions and has single-handedly improved the quality of engineering education in the U.S.”

Cole participated at the end of his first year teaching as a professor.

“The most beneficial part was the focus on interacting with the students during the lecture through thought-provoking questions and the application of theory to real-world problem solving,” he said. “Enthusiasm for teaching was also clearly demonstrated and set as a high standard to model.”

Assistant Professor John Lawson takes part in an ExCEED model exercise (left).

ARCE faculty member Ed Saliklis provides passionate direction to his ExCEED team.



AWARD-WORTHY

ARCE DUO IS RECOGNIZED FOR EXCEPTIONAL FUNDRAISING AND TEACHING

AL ESTES RECOGNIZED BY PROVOST FOR PHILANTHROPY

ARCE Department Head Al Estes was recognized for his philanthropic endeavors, which have raised nearly half a million dollars and renovated outdated laboratories into vibrant spaces with fresh paint, new equipment and improved technology.

The Provost's Leadership Award for Partnership in Philanthropy recognizes a faculty member's superior achievement

in fundraising. Al was presented with the award during Fall Conference 2012.

He is credited with transforming a department that had rarely pursued advancement opportunities into one where fundraising, marketing, alumni relations, and industry partnerships are integral to its operations. He established five-year "naming opportunities," inviting industry partners to donate \$10,000 annually for five years to update labs.

Al secured a \$50,000 donation from parents Florian and Lori Barth as a "challenge" gift to secure \$50,000 in matching funds from other parents, thus creating the ARCE Parents Learn by Doing Fund.

Al is grateful to the provost for this honor. "These gifts allow us to upgrade facilities and enhance student learning in ways that state funds cannot cover. I want to thank Computers and Structures Inc., Hilti, Verco, Simpson Strong-Tie, Fluor, Degenkolb, Mark and Pam Haselton, Jack Berridge, and Florian and Lori Barth for stepping up in these tough economic times to improve the department."

JOHN LAWSON NAMED CFA'S DISTINGUISHED EDUCATOR

ARCE Assistant Professor John Lawson won the Cal Poly chapter of the California Faculty Association (CFA) 2012 Distinguished Educator Award, which recognizes teaching excellence, outstanding professional development and outstanding service of faculty members who have not yet earned tenure.

"John is just terrific," said Department Head Al Estes. "He brings his professional experience into the classroom and makes the structural engineering profession exciting and real for the students."

John was presented with a plaque and a check for \$500 in June 2012 at the CFA end-of-year picnic at Cuesta Park in San Luis Obispo.

"While I truly appreciate this honor, this recognition should also be shared by my ARCE colleagues and Department Head Al Estes, who have demonstrated to me how to encourage, educate and inspire our bright students," John said.



ARCE Department Head Al Estes (above, right) is honored by Cal Poly President Jeffrey D. Armstrong at the annual Fall Conference.

Faculty member John Lawson (right) accepts CFA's award from Glen Thorncroft, Cal Poly CFA chapter president.



CAL POLY, ARCE HOST
MASONRY WORKSHOP
FOR PROFESSORS

A FIRST IN CALIFORNIA

Cal Poly hosted 22 professors from across the country – including two Cal Poly civil engineering professors – and professors from Canada, Saudi Arabia and Costa Rica at the 2012 University Professors Masonry Workshop (UPMW).

ARCE professors James Mwangi and Craig Baltimore organized the three-day summer event and delivered presentations on “Why Teach Masonry,” “Incorporating Masonry into the Curriculum,” and “Innovative Approaches to Masonry Education.”

The workshop was led by The Masonry Society (TMS) with assistance from several sponsoring organizations. This was the first time in its 22-year history that the workshop was held in California. “The response was so great,” James said, “we decided to hold the annual workshop in the Golden State every other year.”

All presentations were intended to provide the professors with the resources and background needed to effectively teach masonry design and construction classes at the university level.

There’s a great deal of work involved in organizing the event. James applied to host it while still on sabbatical in Haiti. “It’s very competitive – and very prestigious – to host it,” he said. He and Craig had a year to finalize the program.

A great many people are involved in the planning process. Three face-to-face meetings were held and several conference calls were made with all the sponsors to decide who would give presentations. “It was very rewarding, and I was very happy with the outcome,” James said. “It’s the beginning of a good relationship.”



Indeed. When representatives from the Concrete Masonry Association of California and Nevada saw the ARCE program, labs, and research being done, they were so impressed, they decided to sponsor the department’s Masonry Design course with a \$10,000-a-year donation for five years. “This marks the first outside sponsor for an ARCE class,” said ARCE Department Head Al Estes. “It ensures we keep it in the curriculum. We hope to use this as a pilot for formalizing a course sponsorship process.”

Major financial sponsors for the UPMW included the Concrete Masonry Association of California and Nevada,

The 2012 University Professors Masonry Workshop offered some valuable hands-on experience for educators nationwide.

Masonry Institute of America, National Concrete Masonry Association Education and Research Foundation, and Western States Clay Products Association.

Other contributing organizations included the Brick Industry Association, Mason Contractors Association of America, National Concrete Masonry Association, Portland Cement Association, Bricklayer & Allied Craftworkers Local 4 and Air Vol Concrete Block.



ARCE AT YOUR SERVICE

Cal Poly's 2013 ARCE Department faculty and staff (front row, from left): James Mwangi, Peter Laursen, Jim Guthrie, Kevin Dong, Craig Baltimore and Graham Archer. Middle row (from left): Christine Cobb (staff), Erling Smith, Cole McDaniel, Department Head Al Estes, Melissa Minor (staff) and Michael Salmon (staff). Back row (from left): John Lawson, Brent Nuttall, Jill Nelson, Pamalee Brady and Ray Ward (staff).

THREE FACULTY MEMBERS PROMOTED TO PROFESSOR

Congratulations to ARCE faculty members Graham Archer, Craig Baltimore and Brent Nuttall, who were all promoted from associate professor to full professor at the end of the 2011-12 academic year.

Graham came to Cal Poly in 2002, after having taught at Purdue University for five years. He earned a Bachelor of Science degree and a Master of Science degree in civil engineering from the University of Waterloo and a doctorate in engineering from UC Berkeley.

Craig, a 1986 Cal Poly ARCE graduate, has been teaching at Cal Poly since 2001. After graduating from Cal Poly, he went on to Duke University, where he earned a master's degree in civil engineering and a doctorate in structural materials.

Brent, also a Cal Poly ARCE alum, has been a member of the ARCE faculty



since 2003. After earning a bachelor's degree from Cal Poly in 1986, he attended UC Berkeley, earning a master's in civil engineering. Brent has his structural engineering license and has had more than a decade of experience in the industry.

"Graham, Brent and Craig are highly deserving of this promotion," said

Professors (from left): Brent Nuttall, Craig Baltimore and Graham Archer

ARCE Department Head Al Estes." Six years ago, we were largely a junior untenured faculty. It is wonderful to see three more faculty members break into the full professor ranks."

LAWSON, LAURSEN AND GRAD STUDENTS RESEARCH

Assistant Professor John Lawson and graduate student Caroline Yarber (M.S. ARCH '12) presented their published paper, "Collective Chord Behavior in Large Flexible Diaphragms," in May at the Structures Congress in Pittsburgh.

With assistance from Simpson Strong-Tie, Beven-Herron Roof Structures, and an \$11,000 grant from Cal Poly, John and Caroline were able to prove there is significant accidental stiffness in timber panelized roofs to affect seismic behavior.

Meanwhile, Associate Professor Peter Laursen continues to investigate the properties of compressed earth block for structures in underdeveloped countries.

Under Peter's guidance, ARCE grad student Ivan Castro tested two full-scale confined masonry walls in the ARCE High Bay Laboratory. Ivan used mildly reinforced concrete framing cast around mildly reinforced cement-stabilized compressed earth block (CEB) masonry infill.

This research builds on previous work done by Peter and civil engineering Professors Daniel Jansen and Bing Qu.



ARCE faculty member Peter Laursen assists civil engineering student Nick Kennedy (center) and graduate student Ivan Castro with the testing of their compressed earth block wall.

ARCE DEPARTMENT FACULTY PROUDLY UNVEIL PLAQUES

The ARCE program has a storied history dating back to 1947. In an effort to capture that history and share it with students, the department prepared perpetual plaques. One plaque lists all the tenure-track faculty members that have ever taught in the department, and the other lists all department heads.

The plaques were unveiled and dedicated at the last faculty meeting prior to Christmas. Emeritus faculty members Satwant Rihal, Jake Feldman and John Edmiston attended the event.

The plaques are proudly displayed in the ARCE Department's hallway outside the main office.



At the plaque unveiling ceremony (from left): Department Head Al Estes and emeritus professors Satwant Rihal, Jake Feldman and John Edmiston



NOT-SO-SILENT PARTNERS

THE ARCE ADVISORS

The spring 2013 ARCE Advisory Board meeting, held May 3-4 at Cal Poly, was unique in that Cal Poly President Jeffrey D. Armstrong invited all advisory boards to meet simultaneously on campus. The occasion included an address by California State University Chancellor Timothy White and the first annual Green and Gold Dinner, held in recognition of Cal Poly's volunteers, donors and friends.

The College of Architecture and Environmental Design hosted a joint breakfast with the Dean's Leadership Council, the ARCE Advisory Board, and the Construction Management Advisory Board. CAED Dean Christine Theodoropoulos reported on the state of the college.

The ARCE board conducted a joint session with the Civil Engineering Advisory Board to discuss opportunities for collaboration between the two programs, and board member Paul Kovach even made time for a presentation to the SEAOC student chapter about Hurricane Sandy.

New board members Bob Newsome (HNTB Architecture), Mark Sarkisian (Skidmore, Owings & Merrill) and Colin Blaney (ZFA Structural Engineers) were

2013 board members are (front row, from left): Ricardo Arevalo (Simpson Strong-Tie), Colin Blaney (ZFA), Luvelyn Benitez (Hope Amundsen) and Department Head Al Estes. Middle row (from left): Paul Kovach (WJE), Grace Kang, Maryann Phipps (eStructure), Steve Schiller (John A Martin, NV) and Robert Gayle (UC Berkeley). Back row (from left): Mark Sarkisian (SOM), Rick Ransom (Brooks and Ransom), Joshua Moody, Robert Newsom (HNTB Architecture), Geoffrey Neumayer (SF Airport) and Mike Botwin (professor emeritus).

welcomed. They join Michelle Kam Biron (American Wood Council) and Luvelyn Benitez (Hope Amundsen), who have volunteered to serve a second term.

Members extended their gratitude to Grace Kang, Joshua Moody and Paul Kovach, who will leave the board after completing their three-year terms.

ARCE ALUMNI REUNITE

ARCE Department students, faculty and staff participated in numerous gatherings of alumni and friends in 2012-13.

The ARCE class of 1982 goes kayaking in Morro Bay as part of their class reunion (right).



The Class of 1965 met for a barbecue at Laguna Lake Park in San Luis Obispo (above).

Recent ARCE graduates Shawn Wade, Emmett Seymour, Jonas Houston, Walt Busch, Selinda Martinez and Marisa Nolasco attended the ARCE Reception at Schroeder's in San Francisco (right).



Nucor Building Systems teammates with military experience hold some of the 50 hand-cut stars that went into a special American flag during a celebration honoring veterans (right).

Nucor sees environmental stewardship as a critical function and an obligation of every team member (below).



IT'S GOOD FOR EMPLOYEES AND GOOD FOR THE ENVIRONMENT

What company gives its employees the freedom to try new ideas, eschews hierarchy to empower employees to solve problems, and ties pay directly to employees' productivity? Would you be surprised to learn it is not a tech company, but a steel company?

Nucor Corp. is the largest steel producer in the U.S. and largest recycler in North America, recycling more than 19 million tons of scrap steel last year. The company employs more than 22,000 teammates at 200 facilities located primarily in the U.S. and Canada. Nucor produced almost 20 million tons of steel in 2012, and its \$19.4 billion in revenue last year ranks it 146th on the Fortune 500 list of largest companies in the country.

The key to Nucor's success is its people – the right people. Nucor hires the best and the brightest and then gives them the freedom to spot problems and solve them on their own. In the words of a Nucor executive, "Teammates excel here because they are allowed to fail." Managers at all levels encourage their teams to try out new ideas. Sometimes the ideas work out; sometimes they don't. But this freedom helps give Nucor one of the most creative, get-it-done workforces in the world.

Nucor has had good luck finding the right people at Cal Poly. Last year,



representatives from Nucor Building Systems in Utah and CBC Buildings, a Nucor division in Lathrop, Calif., were on campus to conduct an information session and interviews with students. Another division of Nucor, Verco Decking, has sponsored an ARCE design lab on campus.

The company's relationship with the school has resulted in three Cal Poly students – architectural engineering and civil engineering majors – interning with Nucor this year. Cal Poly alumna Samantha Trehearne (ARCE '12) was hired by Nucor Building Systems in Brigham City, Utah, as a design engineer.

"Since joining Nucor, I have worked on a range of challenging projects as part of our design team and the research and development team," Samantha said. "Cal Poly helped prepare me to excel in my position by providing the fundamental tools for

success, teaching me how to develop solutions to complex challenges, and instilling the desire to constantly innovate."

Nucor challenges employees to solve problems and find ways to be more productive, and they are rewarded for it. Compensation is tied to productivity through the company's pay-for-performance bonuses that can potentially double a Nucor teammate's take-home pay. This pay-for-performance system is one reason Nucor has never laid off employees at its steel mills. Nucor is truly a place where career possibilities are unlimited. Just ask the current CEO and his predecessor, who both began their careers as engineers. At Nucor, engineers become business leaders.

The company's innovative culture is part of its history. Nucor traces its origins to auto manufacturer Ransom E. Olds, who founded Oldsmobile, and then, in



1905, founded REO Motor Car Co. The company Olds founded evolved to become Nucor. A major milestone in this journey was acquiring South Carolina steel joist and joist girder-maker Vulcraft Corp. The acquisition sparked the company's remarkable growth and created a revolution in American steelmaking.

Borrowing an idea that was already gaining popularity in Europe, Nucor built an electric arc furnace mill, which makes steel from scrap metal. These mills were much smaller and less expensive to build than traditional iron ore mills and came to be known as mini-mills. Nucor opened the first mini-mill in the U.S. in Darlington, S.C., in 1969. Today, mini-mills account for 60 percent of steelmaking in the country.

Nucor continues to build on its innovative history through acquisition and investments. Since 2000, the company

has grown from 7,900 employees at 18 facilities to more than 22,000 employees at 200 facilities. Revenue during that same time increased from \$4.6 billion to more than \$19 billion.

Despite the difficult economic conditions of the last four years, Nucor has invested \$7 billion in capital with another \$1 billion planned for this year. Even with this tremendous growth, Nucor maintains one of the leanest management systems of any Fortune 500 company.

Nucor's principles might be simple, but no one can question their effectiveness. A company that until 1969 hadn't made a ton of steel is now one of the world's largest steelmakers and one of the nation's most admired and imitated companies. In an industry where turning a profit is notoriously difficult, Nucor consistently grows earnings. The company's principles,

A Nucor teammate works at the Vulcraft / Verco Group, the nation's largest producer and leading innovator of open-web steel joists, joist girders and steel decks (above, left).

The Port Canaveral Cruise Terminal in Brevard, Fla., (top) and Corpus Christi Church in Carson City, Nev., (above) are examples of metal building projects manufactured by Nucor Buildings Group.

activated by a team of highly skilled, dedicated teammates, have helped Nucor achieve the industry's highest profits and stock market value. All of these things combined have helped make the Nucor story one of America's great success stories.

Previously profiled industry partners:

John A. Martin & Associates

Barrish Pelham & Associates Inc.

Degenkolb Engineers

KPFF

Fluor Corp.

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Department

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ALL SMILES AT THE MUSTANG MILE

The Mustang Mile is an annual fun run hosted by Scott and Julia Starkey, parents of ARCE student Carson Starkey, who lost his life during his freshman year at Cal Poly. The Starkey family has dedicated their lives to promoting awareness of the dangers of drinking on college campuses. Above (from left): ARCE students, Sinhui Chang, Kevin Pitzer, Shawna Peterson, Ivan Castro, Jesse Hoyer, Ki Park, and Diane Lee prepare for the race through campus.