Civil Matters
Kansas State University Department of Civil Engineering
April 2013, Volume 11, Issue 1

Steel bridge team member constructs “Steel Willie VIII” — story on page 7
From the department head

I begin my tenure as your interim department head with mixed emotions. We all have heavy hearts as we mourn the passing of our dear friend and colleague Dr. Alok Bhandari. In addition to Dr. Bhandari, we lost Professor Philip “Phil” Kirmser and postdoctoral Research Associate Vasanta Pallem. Still, I am proud and honored to have been given the opportunity to serve the faculty, staff and students of our department in the coming months.

I have been deeply touched by the encouragement and support the civil engineering family has shown me. The way we have come together to move forward with Dr. Bhandari’s vision for the department is a testament to his leadership and team-building skills.

In this issue of Civil Matters, we present a glimpse of the department’s activities and accomplishments over the past year under Dr. Bhandari’s leadership. You will read about Cindy Wallis-Lage (’85) who was honored as the 2013 College of Engineering Alumni Fellow, and Brian Armstrong (’93) who received the 2012 Professional Progress Award from the College of Engineering. You will read about the accomplishments of our outstanding faculty members and the awards received by them and their student collaborators. The accomplishments of our students, who have showcased our educational and professional service programs and activities at the state, regional, national and international levels, are also highlighted in this edition.

Our faculty, staff and students extend an open invitation to each of you to drop by for a visit. We’d love to chat with you and show you around the department.

Robert W. “Bobb” Stokes
Professor and Interim Head

2013 College of Engineering Alumni Fellow

Cindy Wallis-Lage

Cindy Wallis-Lage, (BCSE ’85) was honored as the 2013 College of Engineering Alumni Fellow. She joined a distinguished group of Kansas State University alumni who returned to campus to discuss current business and industry trends, and to meet informally with students and faculty in classroom settings and at receptions Feb. 20–22 during the 2013 Alumni Fellows Week.

The program is sponsored by the K-State Alumni Association, the president’s office and the deans council, and the fellows are chosen based on their high levels of professional accomplishment and distinguished service in their respective careers.

Wallis-Lage is president of Black & Veatch’s global water business. Based in Kansas City, Mo., Wallis-Lage leads and manages a work force of more than 2,600 professionals worldwide. She also is a member of the executive committee and board of directors of Black & Veatch, an employee-owned company that delivers Critical Human Infrastructure™ globally, providing consulting, engineering, construction, operations and program management in energy, water, telecommunications and government services.

In her career, Wallis-Lage has been involved in more than 100 projects for municipal and industrial clients around the world. An expert in water reuse and treatment, she is a sought-after speaker and actively serves on committees for numerous industry associations.

Wallis-Lage resides in Leawood, Kan., with her family. In addition to her bachelor’s degree in civil engineering from K-State, she holds an M.S. in environmental health engineering from the University of Kansas. She also served six years on the department of civil engineering advisory council at K-State.

Recognizing academic excellence

Trevor Kaufman, senior CE student from Newton, Kan., is active in the Chi Epsilon and ASCE student chapters. In addition to the Putnam and ASCE R. Delamar Scholarships, Kaufman was selected by the American Council of Engineering Companies as the winner of the ACEC/Life Health Trust Scholarship—one of six national scholarships awarded to the top CE undergraduate students in the nation. He was recognized at the 2012 ACEC Fall Conference in Boca Raton, Fla.

Kaufman is actively engaged in research, working with Prof. David Steward to study water resources challenges related to sustainability, algae production and state-of-the-art GIS approaches. Kaufman is graduating in May and plans to start working while also continuing his education to earn an MBA. He hopes to then earn his PE and eventually move into a management position.

Professional progress

Brian Armstrong (BSCE ’93) received the 2012 Professional Progress Award from the College of Engineering. He began his consulting career with Bartlett & West, Inc. in 1993 as a project engineer and was later promoted to project manager. Currently, he is vice president and unit operations manager for the public works division in Bartlett & West’s Topeka office.
**Women in Civil Engineering**

Women in Civil Engineering (WCE) strives to encourage women in the fields of science and engineering. The organization facilitates academic success through workshops, team-building exercises, mentorship and social events. WCE seeks to provide the resources and programs necessary for women to excel in civil engineering.

**ITE chapter**

The K-State ITE student chapter continues to connect students with the transportation world around them. This fall, the group hosted a reception for Prof. Eugene Russell, who was recently awarded the ASCC 2012 Wilbur S. Smith Award for his contributions to traffic engineering. Russell addressed the group, sharing anecdotes from his career and reflecting on the changes he’s seen.

Students also took a field trip to tour the new Manhattan Traffic Operations Facility. In addition to street sign production and office space, the building hosts the city’s intelligent transportation system, which monitors traffic signals and collects video feeds of intersections. City engineer Peter Clark openly assisted students in understanding life as a local traffic engineer.

**Student experiences**

**Ecuador**

In January 2012, I had the opportunity to travel with K-State Engineers Without Borders to a small farming community in Yakuñay, Ecuador. The people of this community were so welcoming and had planned a celebration for our arrival with delicious food, drinks, dancing, singing and speeches from the president and other members in the community. Despite speaking very little Spanish, I was still able to form relationships with people from Yakuñay by working alongside them, and in our spare time by playing volleyball and playing with the many children in the community. Even though the living conditions in Yakuñay weren’t anywhere near as luxurious or comfortable as living here at K-State in Putnam Hall or Jardine, the people in this community live joyful lives and truly value what they have.

A goal we met on this project trip was installing water meter spouts in most of the houses, while showing the other households how to do so as well.

**Chi Epsilon news**

Chi Epsilon has been quite busy with the recent induction of eight new members in fall 2012: Lucas Spaich, Carl Peterson, Joseph Burgett, Andrew Brunner, Gregory Canales, Daniel Lamberger, Cale Armstrong and Vincent Studer.

For its biannual service project, Chi Epsilon officers and initiates teamed up with the U.S. Army Corps of Engineers and picked up trash and debris at the Turtle Creek Marina. This spring, the chapter plans to team up with the Army Corps of Engineers again and help with cleanup around the lake.

The CE 101 mentoring program established in 2012 continues to be a success. Officers of Chi Epsilon also attended graduate and undergraduate interview sessions with the CE department’s geotechnical faculty candidates.

An older member of the community said he had never had running water to his house before, and he became very eager to learn and help with the rest of the project.

This trip broadened my perspective of living conditions in developing communities and gave me the opportunity to build relationships with the people of Yakuñay. I also began to better understand how the valuable skills and training civil engineering gives me can be used for more than solving problems and completing projects. Application of these skills most importantly helps people and their communities. This is an opportunity and responsibility civil engineers have, whether in a small town or city here in the U.S., or abroad in a developing community where basic sanitation is a challenge. I look forward to learning more in my civil engineering studies here at K-State, and for the work experience where others can benefit from my degree.

**Passings**

**Alok Bhandari**

Alok Bhandari, 44, Manhattan, Kan., passed away Jan. 30, 2013, after a courageous battle against cancer. Bhandari was the Dr. Robert Snell Alumni Professor and department head of civil engineering at Kansas State University. He also served as the founding director of the Urban Water Institute, Kansas State University-Olathe. He was a passionate teacher, a dedicated administrator and prolific scholar.

A recipient of the National Science Foundation’s CAREER award, the Kansas–Science to Achieve Results (K-STAR) First Award, and Virginia Tech Civil Engineering’s Outstanding Young Alumni Achievement Award, his academic career was focused on research and teaching in environmental engineering. He authored or co-authored more than 100 publications.

He is survived by his wife, Nidhi Bhandari; their 10-year-old daughter, Mira; his parents, Tara C. and Sheela Bhandari; and his sister, Ila Sharma.

Memorial services were held Feb. 9, 2013, at the All Faiths Chapel at Kansas State University. A reception followed in the Fiedler Hall Atrium.

Memorials have been established at the KSU Foundation for the Alok Bhandari Memorial Scholarship (www.found.ksu.edu/give/lok) and the Engineers4cancer Foundation (www.engineers4cancer.org), which is a non-profit charity started by his daughter Mira Bhandari to help provide assistance to the caregivers of cancer patients.

**Philip G. Kirmser**

Philip G. Kirmser died July 26, 2012, in Manhattan, Kan. He held three degrees, all from the University of Minneso- ta—B.S. in chemical engineering, and M.S. and Ph.D. in mathematics, 1939, 1944 and 1958, respectively.

After U.S. Naval service in WWII, he joined the K-State faculty in 1948 as an associate professor of applied mechanics. In 1958 he became a full professor and served as head of the applied mechanics department from 1962-1975. He continued teaching in various departments in the College of Engineering up to, and after, his retirement in 1990.

Kirmser was a registered professional engineer in Kansas; a visiting scientist at the Institute Battelle in Geneva, Switzerland in 1970; a visiting professor in the department of mathematics at the Ecole Polytechnique Federale in Lausanne, Switzerland in 1978; and a consultant to the Digital Equipment Company in Geneva in 1985. He was a prolific writer of scientific articles and was widely published. He held four patents, spoke four languages and was a classical musician.

He was preceded in death by his wife of 70 years, Jeanne Kirmser; and is survived by a son, Larry; daughter, Sandy; and one grandson.

**Vasanta Lakshmi Pallem**

Vasanta Lakshmi Pallem, former postdoctoral research associate working under the direction of CE Professor Alexander Mathews, passed away on Feb. 7, 2013, of smoke inhalation from a fire in her apartment complex in Manhattan, Kan.
April 20.

It has been 24 hours since I sat in the All Faiths Chapel and witnessed firsthand why I am so proud to be a part of the civil engineering family within the College of Engineering. Since my first advisory council meeting in the fall of 2007, I have come to appreciate more and more each year the great work of our faculty, supported by enthusiastic and hardworking staff, to prepare the next generation of civil engineers from a bright and eager-to-learn student body. But until one so beloved as our department head, Dr. Alok Bhan-dari, passed from this earth too young, I don’t know that I understood the familial bonds that run so deep inside and outside the walls of Friedler Hall. Along with approximately 300 family members and friends, we celebrated the life of a man who loved his family, lived life fully with that trademark smile and was devoted to the faculty, staff and student body in his tireless efforts to continually improve upon the great tradition of the civil engineering department. We will miss Alok, but I know that his spirit will live on through each individual he touched.

That was never more evident than last September when the advisory council was treated to a tour of the lab facilities by Dr. Bob Peterman and Ryan Benteman, research technologist. The enthusiasm they displayed was infectious. They left no doubt of their passion for creating an environment in which the students could excel at learning, but also to be part of groundbreaking research and development that has a positive impact in industry. As a member of the advisory council, I am excited and encouraged to see such passion, and how that translates into the development of students.

This continues to be an exciting time at K-State civil engineering. The enrollment remains strong. The department has been accredited for six years based on ABET approval last fall. And recent changes in the curriculum will better prepare the students as they go out into the industry.

The civil engineering advisory council is committed to assisting the department in providing the highest quality of education. In the weeks and months to come, we will give Dr. Bobb Stokes, interim department head, our full support with issues related to funding, curriculum review, student activities, and the development of research and transfer. Understanding that adequate funding is necessary to attract and maintain top-level students, faculty and facilities, the advisory council will be actively involved with identifying funding sources and educating alumni on needs in the department.

The civil engineering advisory council is passionate about our civil engineering department and the advancement of engineering at K-State.

Eight consecutive nationals for steel bridge team

The 2012 K-State steel bridge team, led by Rachel Spicer, Shawnee, Kan., placed 2nd overall at the regional competition held in Omaha, Neb. The bridge took 2nd in construction speed with 23.4 minutes; lightness at 284.1 lbs; deflection with 1.313 inches; structural efficiency at $4,153,500; and display. The team took first in economy as ACI code books.

Nichols, freshman/sophomore representative, has begun initiating multiple programs to get freshmen more involved with the chapter, including a mentoring program, freshman seminars and field trips that will begin in the fall.

Tim Barr (BSCE ’85) is adjusting to life in a college town as an adult. After more than 20 years in the Chicago suburbs and two years in South Carolina, he finds himself back in Manhattan working for the Department of Homeland Security as project manager for the National Bio and Agro-Defense Facility being constructed on the Kansas State University campus.

His previous involvement with large nuclear non-proliferation projects provided wonderful challenges, but the McPherson, Kan., native is relishing his current role with a project having such a significant impact not only on the national level, but also for both the university and the state of Kansas.

Barr enjoys riding his bicycle in the hills around town to unwind and, most importantly, attending K-State football games with his wife, Cathy. They also enjoy traveling to Nashville and Australia to properly spoil their grandchildren.

Laura White graduated in 2010 with a B.S. in civil engineering, a secondary degree in natural resources and environmental sciences, and a minor in leadership studies. She is now a civil/environmental engineer with Burns & McDonnell at its world headquarters in Kansas City, Mo. Her recent projects focus on solid waste, large-scale environmental remediation, and oil and gas exploration and storage.

Along with her technical work, she is involved in the company’s recruiting of new employees, intern program, community outreach and education programs, and in several company’s recruiting of new employees, intern program, with Burns & McDonnell at its world headquarters in Kansas City, Mo. 然后进行为期一年的学术交流，最终在2010年考入K-State.

Laura White graduated in 2010 with a B.S. in civil engineering, a secondary degree in natural resources and environmental sciences, and a minor in leadership studies. She is now a civil/environmental engineer with Burns & McDonnell at its world headquarters in Kansas City, Mo. Her recent projects focus on solid waste, large-scale environmental remediation, and oil and gas exploration and storage.

Along with her technical work, she is involved in the company’s recruiting of new employees, intern program, community outreach and education programs, and in several company’s recruiting of new employees, intern program, with Burns & McDonnell at its world headquarters in Kansas City, Mo. 然后进行为期一年的学术交流，最终在2010年考入K-State.

Laura White graduated in 2010 with a B.S. in civil engineering, a secondary degree in natural resources and environmental sciences, and a minor in leadership studies. She is now a civil/environmental engineer with Burns & McDonnell at its world headquarters in Kansas City, Mo. Her recent projects focus on solid waste, large-scale environmental remediation, and oil and gas exploration and storage.

Along with her technical work, she is involved in the company’s recruiting of new employees, intern program, community outreach and education programs, and in several company’s recruiting of new employees, intern program, with Burns & McDonnell at its world headquarters in Kansas City, Mo. 然后进行为期一年的学术交流，最终在2010年考入K-State.
Concrete canoe team gains momentum

The concrete canoe team has made great strides in increasing and maintaining membership, being creative with hull design and trying new ways to advance the team.

Inspired by the building momentum of the team, co-captains Brianna Krysztof, Baldwin, Kan., and Jenny Swabb, Baseloh, Kan., named the 2012-2013 canoe “Taking Flight,” with its aesthetics and display following an Amelia Earhart theme.

With increased membership, the team was able to accomplish more in less time. The team co-captains felt confident in pushing the team to pursue ideas they hadn’t before, such as constructing a practice canoe and creating a new hull design.

For the first time since 2008, the rules allowed teams to use hull designs other than the standard-concrete canoe and creating a new hull would give the canoe a faster speed potential by decreasing the beam-to-length ratio. The team lowered the bottom of the hull. With the new design, and plenty of paddling practices at Tuttle Creek Lake, the team’s racing scores improved significantly.

The concrete canoe team’s hard work and creativity gave them a 6th place finish out of 10 teams at the 2012 mid-continent conference in Lincoln, Neb., with the sub-scores of 3rd place in racing, 2nd place in oral presentation, 7th place in design paper and 6th place in final product.

Preparation for the upcoming competition is well underway. The team’s main goal for this year is to make a significantly lighter canoe than last year. The team is excited to see if the lightweight design will work, and even more excited to not have to haul another 460-pound canoe.

New co-captains Kätzyl Dotson, Junction City, Kan., and Nathan Pohl, Hutchinson, Kan., are joining returning co-captain Swabb to lead the team to victory at Southern Illinois University Edwardsville on April 4-6 with this year’s canoe, USS Wildcat.

Dissemination of new findings in damage detection and wind engineering

A special issue of the ASCE Journal of Engineering Mechanics on “Experimental Methods in Damage Detection and Wind Engineering” was published in March 2013. Asad Esmaeily, associate professor of structural engineering, chair of the ASCE Engineering Mechanics Institute experimental analysis and instrumentation committee and the guest editor of the journal, noted that two of the papers in this highly ranked journal were authored by his colleagues, Bob Peterman and Hayden Radheed, faculty in the civil engineering department at K-State.

Progressive collapse of a number of the aging bridges and buildings in recent years have been initiated by local damage undetectable by visual inspection or other conventional methods. Damage detection is a necessary part of a system for continuous monitoring of bridges, buildings and other important components of the nation’s civil infrastructure.

Also, the increasing number of hurricanes and tornadoes and their destructive effects have necessitated more wind-related research to enhance the current knowledge on wind engineering and address possible pore detection. This program was developed by Kyle Riding, PI, and Asad Esmaeily, co-PI, both associate professors, to address the needs of a K-TRAN project.

This software, especially with the new functionalities that will be added to the next version, can be a valuable tool for researchers to explore various aspects of different aggregate and pore sizes and their spatial distribution, as related to the physical properties and durability of a mix.

Software to determine efficacy of current concrete aggregate specifications

This special issue of the ASCE Journal of Engineering Mechanics, Esmaeily added, will extend the existing knowledge base on the experimental methods in damage detection, health monitoring and wind engineering, and pave the way towards more involvement of the CE department in disseminating the latest findings in these areas.

2012 civil engineering fall banquet awards

ASCE Advisor of the Year Award: Kyle Riding
ASCE Outstanding Faculty Award: Mustaque Hossain
Chi Epsilon Undergraduate Teaching Excellence Award: David Steward
Chi Epsilon Student Advocate Award: Ryan McGrath
CE Grad Student Council Faculty Award: Kyle Riding
Outstanding University and Professional Service Award: Mustaque Hossain
Outstanding Student Award: Ryan Benteman
Outstanding Teaching Award: Asad Esmaeily
Outstanding Colleague Award: Steve Starrett
Outstanding M.S. Award: Ahmed Al-Rahmani
Outstanding Ph.D. Award: Niranga Amarsingha

Outstanding University and Professional Service Award: Mustaque Hossain
Outstanding Staff Award: Ryan Benteman
Outstanding Teaching Award: Asad Esmaeily
Outstanding Colleague Award: Steve Starrett
Outstanding M.S. Award: Ahmed Al-Rahmani
Outstanding Ph.D. Award: Niranga Amarsingha
Biofuel co-product helps in stabilization of unpaved roads

Although unpaved roads often serve as the only transportation lifelines for many rural communities in Kansas, U.S. and worldwide, they remain plagued by washboarding, raveling, rutting, pot-holing and dust generation. This results in frequent maintenance operations, which are costly and disruptive to traffic.

Associate Professor Dunja Perić has been investigating use of calcium lignosulfonate (CaL), a biofuel co-product resulting from the binding properties of CaL-water mixes, for stabilization of unpaved roads. CaL, is derived from lignin, the second most abundant terrestrial organic polymer found in cell walls of most plants. Consequently, combining CaL with soil, the most abundant material on Earth, to build the rural transportation lifelines appears to be a very sustainable concept.

To this end, two former graduate students, Paul Bartley and Wilson Smith, have recently been awarded M.S. degrees for their investigations of shear strength of masonry sand-CaL-water mixes. Both early age and strengths after air drying show promising results.

This research was featured in a 2012 article in Prism, a magazine of the American Society of Civil Engineering. It was supported by the University Transportation Center. Borregaard LignoTech, Rothschild, Wis., and Midwest Concrete Materials, Manhattan, Kan., donated the materials.

Research yields biomass pretreatment for concrete

Concrete, the most used material after water, is made out of three major components: Portland cement, water and aggregate. Because some greenhouse gases are released during the manufacture of Portland cement and it is used in such large quantities worldwide, the cement industry is responsible for about 5% of global man-made carbon dioxide emissions.

Research at K-State is being performed under NSF grant CMMI-103093 to develop a new generation of supplementary cementitious materials (SCMs) to replace some of the Portland cement used in concrete that is highly reactive and widely available at low cost. To accomplish this goal, biofuel pretreatment processes, such as dilute acid and steam explosion treatments are being applied to the production of a new class of highly reactive SCMs made from biomass.

From this research, it was found that these material pretreatments can greatly improve concrete strength by removing alkalis out of the biomass and breaking down the cellulosic structure of straw and stover before ashing. This greatly increases the ash reactivity in concrete, making it a more valuable agricultural co-product which can improve concrete strength and durability.

Publication announcement

Hani Melhem, professor of civil engineering, and his former graduate student, Astandyar Inayat, announce the recent publication of their book, Critical Success Factors for Organizations in Construction Projects: A Quantification and Analysis of Engineering Judgment through Analytical Hierarchy Process and Statistical Approaches, Lambert Academic Publishing.

Concrete institute honors college activities with “Excellent University” award

Kansas State University’s College of Engineering was named an American Concrete Institute (ACI) “Excellent University” for its accomplishments in 2012. The university is one of just 16 to receive ACI’s Award for University Student Activities. The honor recognizes universities that participate in institute-related activities.

Contributions from the departments of civil engineering and architectural engineering and construction science helped the college earn the honor. K-State has 69 students who are ACI members. In 2012, these students competed in two institute competitions.

The award was also based on student and faculty attendance at ACI conventions and service on institute technical committees. Ahmed Abd El Fatah, CE doctoral graduate, served on the ACI 440 committee—fiber-reinforced polymer reinforcement—and its 441 committee—columns. CE faculty members Hayder Rashid, Kyle Ridig and Asad Esmaeily were all actively involved with the institute.

“This honor is a great accomplishment for me, my colleagues, our students and Kansas State University,” Rashid said. “It represents our commitment to professional service activities in our fields of expertise.”

The award was presented at the American Concrete Institute’s 2013 spring convention, in Minneapolis, Minn.

Team studies aquifer impact on agriculture production

Groundwater is important for Kansas and Kansans. The Ogallala Aquifer provides a reliable source of water for irrigated corn production, which in turn is used to support production of five to six million head of cattle to feed every year. And yet, pumping rates in Western Kansas exceed the rate of natural recharge, resulting in a steadily declining storage of water.

At future times, wells will begin to go dry. CE Professor David Steward and his team are researching how groundwater is being used to grow corn and cattle. A variety of scenarios are being evaluated to learn how changes in policy and management practices might impact this system. Team members are looking at hydrologic pathways and the potential to enhance recharge rates, as well as how declines in groundwater pumping will impact crop production and the availability of corn to support the regional cattle industry.

Russell selected for national award, committee chair

Eugene Russell, professor emeritus of civil engineering, was recently selected to receive the 2012 Wilbur S. Smith Award from the American Society of Civil Engineering for his contributions to enhancing the role of civil engineers in highway engineering. He was also recently appointed chair of the Roundabout Committee of the Transportation Research Board, a division of the National Research Council.
Dear Alumni and Corporate Friends

Kansas State University

Civil Engineering Enhancement Fund

Here is my check or credit card authorization for a gift of:

- $500
- $100
- $25
- Other $__________

Please make check payable to Kansas State University Foundation

Credit card payment:

I/We have provided for K-State in my/our will.

Contact me/us about creating a scholarship.

Contact me/us about gifts that pay lifetime income.

Contact me/us about gifts that pay lifetime income.

Or make your gift online at www.found.ksu.edu

Matching gift information

If you are currently employed by a company that matches gifts, please see your company's directions for completing the matching gift process. For more information, contact your human resources department or wwwmatchinggits.org

Thank you for your generous support!

Name (print) __________________________

Address __________________________

City State ZIP

Phone __________________________

Email __________________________

If this is a business credit card, business name: ____________________________________

If this is a business credit card, business name: ____________________________________

Credit card payment:

I/We have provided for K-State in my/our will.

Contact me/us about creating a scholarship.

Contact me/us about gifts that pay lifetime income.

Matching gift information

Matching gift information

If you are currently employed by a company that matches gifts, please see your company's directions for completing the matching gift process. For more information, contact your human resources department or wwwmatchinggits.org
PLANNING AND DESIGN EXCELLENCE SINCE 1914

HNTB serves clients in the transportation, architecture and federal markets with integrity, technical excellence and a commitment to providing quality work, on time, on budget and to the client’s satisfaction.

K-18 CORRIDOR (Ogden to Manhattan)
Riley County, Kansas

AMELIA EARHART MEMORIAL BRIDGE
Atchison, Kansas

I-435/U.S. 69 INTERCHANGE
Overland Park, Kansas