

Civil Matters



Kansas State University Department of Civil Engineering

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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, also are 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

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2013 College of Engineering Alumni Fellow Cindy Wallis-Lage

Cindy Wallis-Lage, (BSCE '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 dean's 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. Delamater 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, mentoring and social events. WCE seeks to provide the resources and programs necessary for women to excel in

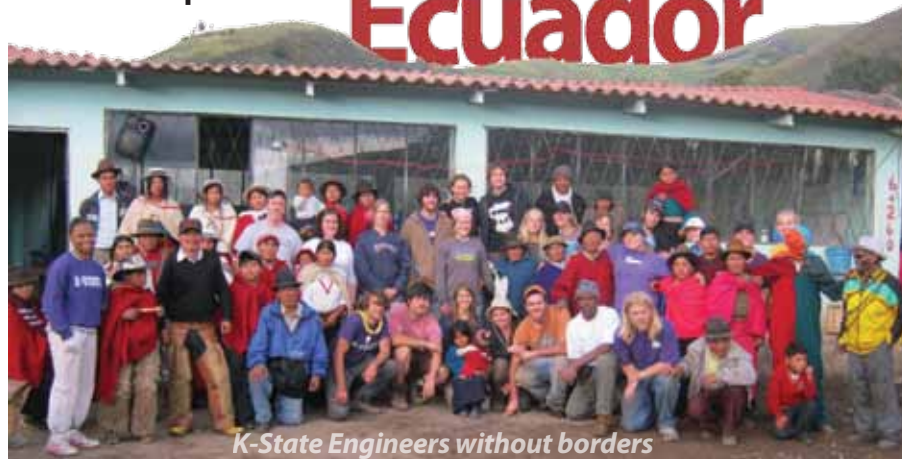
career development paths, whether in academia, industry or elsewhere. Its mission is to increase awareness and interest in materials science and engineering among the female population, as well as provide a sustainable networking system within the CE department and College of Engineering at Kansas State University.

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 ASCE 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 feed 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, drink, 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, XE officers and initiates teamed up with the U.S. Army Corps of Engineers and picked up trash and debris at the Tuttle 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.

Kathryn Biver, CE junior

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/alok) 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 Minnesota—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, Jeune 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.

'83 Greg Weatherd

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 Bhandari, passed from this earth way too young, I don't know that I understood the familial bonds that run so deep inside and outside the walls of Fiedler 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.



'10 Laura White

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 professional societies in the area. She is currently pursuing her master's degree in engineering management from the University of Kansas, but insists on wearing K-State attire whenever she steps on the Edwards campus.

White takes every chance possible to get back to Manhattan, including planning her on-campus wedding to a fellow Wildcat, which will coincide with K-State's Open House on April 20.



'85 Tim Barr

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 K-State 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.



ACSE chapter update

A mix of new and old officers, projects and events has students in ASCE excited for the coming semesters.

Currently seven officers have served in a previous executive role, with five officers being elected for the first time. New officers Cale Armstrong, Travis Bailey, Logan Nichols, Mark Stewart and Jaime Quilty have provided many new ideas to improve the chapter.

Armstrong has accepted a newly created position of fundraising chair and attended a workshop for student chapter leaders last January in Milwaukee, Wisc., where he gathered ideas to bolster the chapter financially. He has begun an ASCE polo drive and continued selling FE review manuals as well 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.

ASCE has also undertaken a semester-long special project. Spearheaded by special projects chair Logan Ortiz, the chapter has been working alongside administrators at the Sunset Zoological Park in Manhattan where it will be constructing a shade structure at the cheetah exhibit. The timber structure will be approximately 30' by 32' and will cover the viewing area and extend into the exhibit to seemingly bring the animals and people closer to one another. The design stage is almost complete and groundbreaking will be in March. ASCE has partnered with members of

ASID of the architectural engineering and construction science departments on the project.

The chapter is also trying to rekindle relationships with the Kansas Section of ASCE, the Younger Member Group of ASCE, the Wichita branch and the Kansas Society of Professional Engineers. This includes attending monthly meetings, helping with outreach events and attending socials.



Prof. Hossain with practitioner advisor Dave Karnowski, named Region 7 Outstanding Practitioner Advisor of the year

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 with a cost of \$5,587,500. Construction economy is based on the build time as well as the number of builders. Structural efficiency is based on weight of the bridge and aggregate deflection. The bridge is then given an overall score, which is the economy plus the efficiency.

After the strong showing at regionals, the team moved on to Clemson University in South Carolina for the national competition. There the team was able to cut 5.88 minutes off of the original build time and after fixing a couple of dimension penalties, dropped the weight by 100 lbs, finishing 27th overall out of



ASCE members gather for fall 2012 picnic.

ASCE began mentoring middle school students as an outreach event last semester and is continuing that effort this semester. Andrew Brunner and Adam Emerson made presentations and conducted activities with the science club at Eisenhower Middle School in Manhattan to try and encourage students to consider engineering. Brunner and Emerson used the cardboard canoe and note card tower as activities to teach about buoyancy, centroids and statics.



"Steel Willie VIII" along with the members of the 2012 steel bridge team

47 teams as well as placing 6th in display.

Andrew Wiederholt and Chris Rottinghaus hope to lead the 2013 team towards a ninth straight national appearance and continued success. The regional will be held in Edwardsville, Ill., April 4-6 and nationals will be in Seattle, Wash., May 31-June 1.

Fabrication on this year's bridge began in January with hopes to be completed by mid-March. Design of the bridge is once again an under truss with a cantilever. Due to rule changes this year, any kind of twisting connections and/or dovetail connections are illegal, which introduces many new design challenges.



Students and Sunset Zoo representatives discuss a new structure that ASCE will design and build on the site.

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, Basehor, Kan., named the 2012-2013 canoe "Taking Flight," with its aesthetics and display following an Amelia Earhart theme.



Concrete canoe team members at regionals in Lincoln, Neb.



Co-Captains Krysztof and Swabb in front of Taking Flight

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 standardized one provided by the NCCC. The team created a new hull design that would give the canoe a faster speed potential by decreasing the beam-to-length ratio and rounding

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



The team lowers Taking Flight into the dunk tank for a swamp test.

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 Katlyn 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.



Dalen Dickerson, Moundridge, Kan., and Brandon Heavener, Emporia, Kan., place 3rd in men's endurance race.

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 Esmaily, 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 Hayder Rasheed, 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 needs for code revisions and refinement of design procedures.

This special issue of the ASCE Journal of Engineering Mechanics, Esmaily added, will extend the existing knowledge base on the experimental methods in damage detection, health

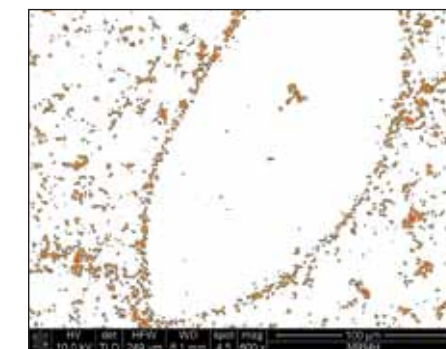
monitoring and wind engineering, and pave the way towards more involvement of the CE department in disseminating the latest findings in these areas.

Software to determine efficacy of current concrete aggregate specifications

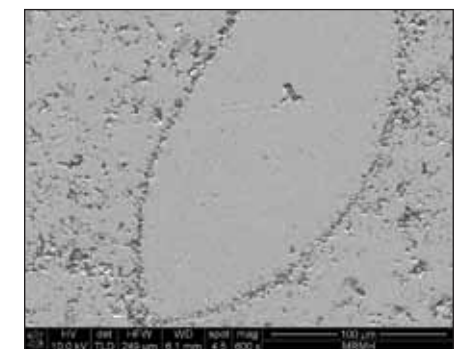
The first version of the standalone Windows-based software for quantifying pore-size distribution in limestone aggregate using scanning electron microscope images was developed with a built-in macro functionality, allowing the user to specify a series of image filters, treatments, analyses, and saving features that can be repeated on other images. Other program features include image histogram renormalization, median filter, binary thresholds and

pore detection. This program was developed by Kyle Riding, PI, and Asad Esmaily, 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.



Scanning electron microscope (BSE) mode image in back-scattered electron (BSE) mode after histogram normalization and use of median filter



Pores detected from the same image

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 Teaching Award:

Asad Esmaily

Outstanding Colleague Award:

Steve Starrett

Outstanding Research Award:

Kyle Riding

Outstanding University and Professional Service Award:

Mustaque Hossain

Outstanding Staff Award:

Ryan Benteman

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 world-wide, they remain plagued by wash-boarding, 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 Education. It was supported by the University Transportation Center. Borregaard LignoTech, Rothschild, Wisc., and Midwest Concrete Materials, Manhattan, Kan., donated the materials.



Wilson Smith and CE Associate Professor Dunja Perić review samples testing sustainability of masonry sand-CaL-water mixes.

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 reactivity 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, Asfandiyar 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.



Hani Melhem

Biomass pretreatment process



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 construc-

tion 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.

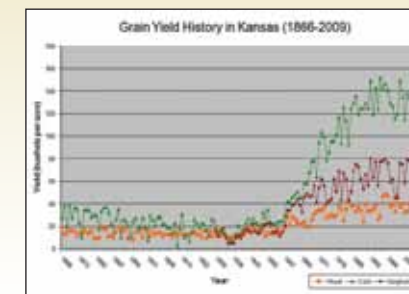
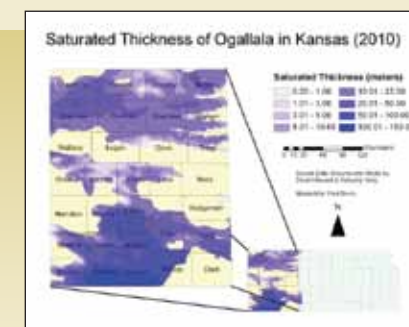
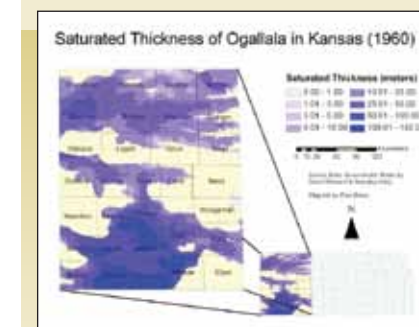
The award was also based on student and faculty attendance at ACI conventions and service on institute technical committees. Ahmed Abd El Fattah, CE doctoral graduate, served on the ACI 440 committee—fiber-reinforced polymer reinforcement—and its 441 committee—columns. CE faculty members Hayder Rasheed, Kyle Riding 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," Rasheed 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.

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 enhance 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.



Graduating seniors practice civil engineering in “real-life” project

Every semester, the graduating class works on a senior design project that is either ongoing in the city of Manhattan, or is expected to be implemented in the near future. This capstone course is required in the CE curriculum and is taken by all students in the semester in which they graduate. It is intended to provide an experience that integrates various design areas in a comprehensive, open-ended project. This typically involves designing elements from the various areas of transportation, water resources, environmental, geotechnical and structural engineering. The design involves incorporating appropriate engineering standards, economic considerations and multiple realistic constraints while considering criteria such as impact on the natural environment, sustainability, constructability, ethics, public health and safety, social impact, esthetics and political context. In the class, design problems of current interest in the Manhattan area involving actual local sites are selected to emphasize the real-world character of the work expected of the students.

The class is divided into design teams of four to six members. Teams are organized so that members complement their design experience in various civil engineering sub-areas. During the semester, each student serves as chief engineer of the design team for a particular design task. As chief engineer, he or she is responsible for preparing weekly/biweekly written and oral progress reports, as well as presenting oral and written task reports at the end of a major task. Chief engineers also assign work to the members of their teams and submit



Capstone-course team members preform a site visit in Manhattan to develop project plans.

written evaluations of each of the design team members at the end of the task. Design team members, in turn, evaluate the work of the chief engineer and the oral task reports. All members of the design team collaborate in preparation of a final written project task report.

The course also includes a seminar series that leads to a general understanding and appreciation of the professional, social and ethical responsibilities of the practice of civil engineering. Reading assignments are selected every week and discussed during a portion of the weekly class meetings. Individual students are assigned on a rotational basis to lead the discussion. Outside engineering professionals are also invited once or twice a semester to present topics related to professional development and the various aspects of engineering practice.

The professor-in-charge organizes and conducts the course. Other faculty members serve as primary consultants for each of the various design tasks. Quite often and almost every semester, practitioners from industry and consulting firms get involved in the course, providing input and advice to the students. All departmental faculty, practitioner advisors and graduate students are invited to the oral presentations, and evaluate and critique the presentations. The students seek input from other consultants, both on and off campus, as needed during the semester, and outside speakers with knowledge and experience relating to the assigned project are occasionally invited to facilitate interactions with the project teams.

The spring 2013 semester has 35 graduating seniors. The project is

about modifying the city lot at 3131 Anderson Avenue in Manhattan from a fire and rescue station to a utilities operation facility. It will need to house the service and maintenance vehicles, and serve as the base for the maintenance crews and their equipment. The class activity starts with a site visit to explore the site conditions and existing topography and land use.

The subject lot must be redeveloped in conformance with local ordinances and engineering standards. A site layout is to be developed to use the available space efficiently. The transportation engineering aspects include site access and internal circulation, service vehicle parking, public/visitor and employee parking, and public/employee access to buildings. Pavement will need to be designed as well as adequate drainage of storm water.

This also includes developing a utility plan to provide additional water and sewer service to a wash rack for the utilities vehicles.

Structural and foundations aspects include constructing an additional structure needed as a garage/shop for the utilities vehicles. The required area will be a partially enclosed floor space, directly accessible from the driveway or parking lot. Structural aspects include determination of the

design loads and the material(s) of choice for construction, and the design of different structural components that will be used in the structural system. Foundation aspects include identification of soil properties, selection of type of foundations and design of those foundations, as well as any earth-retaining walls that might be necessary. Detailed cost estimates are required.

Distance education master's degree courses

The civil engineering department offers graduate-level courses leading to a master of science degree in civil engineering to off-campus students—no matter where they live. All courses needed for the degree will be offered online or by other multimedia delivery methods. Students only need to travel to K-State once,

at the end of their program, for an oral examination conducted by their graduate committee. A master's degree can also be counted as a year of credit toward earning a professional engineering license. For information on earning this license, go to the Kansas Board of Technical Professions online at <http://www.kansas.gov/ksbtp/>.

Summer 2013

- CE 703 Responsibility in Engineering: Codes and Professionalism
- CE 704 Responsibility in Engineering: Leadership and Diversity
- CE 790 Prb/Engineering Ethics Case Studies

Fall 2013

- CE 654 Design of Groundwater Flow Systems
- CE 690 Top/Basics of Engineering Ethics
- CE 704 Responsibility in Engineering: Leadership and Diversity
- CE 732 Advanced Structural Analysis I
- CE 742 Advanced Steel Design
- CE 745 Structural Dynamics
- CE 752 Advanced Hydrology
- CE 766 Wastewater Engineering/Biological Processes
- CE 775 Traffic Engineering
- CE 777 Portland Cement Concrete Pavements
- CE 786 Land Development for Civil Engineers and Planners
- CE 790 Prb/Sustainability and Green Engineering
- CE 816 Topics/Modern Roundabout Analysis and Design
- CE 816 Topics/ABAQUS Applications in Geosystems

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Manhattan, KS 66506-6001
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Undergraduate scholarship recipients

- Cale Armstrong** (Shawnee, Kan.) Francis D. Wagner Memorial Scholarship, S. H. Brockway Memorial Scholarship, William R. and Mila Kimel Engineering Scholarship

Andrew Bernica (Topeka, Kan.) Bartlett & West Inc. Civil Engineering Scholarship, Francis D. Wagner Memorial Scholarship, Kenneth and Maria Rector Scholarship, Shelby K. Willis Civil Engineering Scholarship

Antoine Borden (Colorado Springs, Colo.) NACME Scholarship

Andrew Brunner (Silver Lake, Kan.) Engineering Scholarship, Karl J. Svaty Memorial Engineering Scholarship

Joseph Burgett (Carbondale, Kan.) Alan and Sharon Sylvester Civil Engineering Scholar, Carl R. Ice Dean's Excellence Fund, Engineering Scholarship, 'Red' Web Sproul Memorial Scholarship

Gregory Canales (Emporia, Kan.) Bruce E. Roberts Scholarship, Charles A. Stryker Memorial Engineering Scholarship

Caleb Childs (Wichita, Kan.) Warren and Mary Lynn Staley Engineering Excellence Scholarship

Dillon Cowing (Clay Center, Kan.) Brungardt Honomichl & Company, PA Civil Engineering Scholarship, Walter A. Buchheim Memorial Scholarship

Brady Crites (Overland Park, Kan.) Bartlett & West Inc. Civil Engineering Scholarship, Coonrod Memorial Civil Engineering Scholarship, Jeanne M. and Edward J. Mulcahy Scholarship, Walter M. and Alice K. Bellairs Scholarship

Joshua Dlabal (Wilson, Kan.) Walter M. and Alice K. Bellairs Scholarship

David Ecklund (Overland Park, Kan.) Chas Turnipseed Memorial Fund Engineering Scholarship, The Wildcat Construction Company, Inc. Scholarship

Adam Emerson (Tomball, Texas) Walter M. and Alice K. Bellairs Scholarship

Eric Fletcher (Topeka, Kan.) Jim and Pat Guthrie Civil Engineering Scholarship, Roger W. Coulter Scholarship in the College of Engineering, The Claude and Lucellustine Wilson Minority Engineering Scholarship, The Edward L. Wilson Civil Engineering Scholarship, Walter M. and Alice K. Bellairs Scholarship
- Allison Franken** (Kansas City, Mo.) Glenn L. and Doris A. Ellithorpe Scholarship, Herb and Mary Sue Whitney Scholarship

Claudia Gonzalez (Wichita, Kan.) Successful Engineers Scholarship, The Claude and Lucellustine Wilson Minority Engineering Scholarship, Warren and Mary Lynn Staley Engineering Excellence Scholarship

Ashley Green (Rose Hill, Kan.) Walter M. and Alice K. Bellairs Scholarship

Brandon Heavener (Emporia, Kan.) Ralph and Dora Rogers Memorial Scholarship

Trevor Kaufman (Newton, Kan.) Chas Turnipseed Memorial Fund, Mick and Nancy McAuliffe Civil Engineering Scholarship, R. D. and Mary C. Andersen Scholarship

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Ethan Peck (Russell, Kan.) Bruce E. Roberts Scholarship

Carl Peterson (Overland Park, Kan.) Beavers Heavy Construction Scholarship, E. C. Lindly Scholarship for Engineering Students, Engineering Scholarship

Dustin Phommanivong (Olathe, Kan.) Edmond E. Young Scholarship, Engineering Scholarship, Joseph C. and Elsie May Fickel Endowment
- Yadira Porras** (Newton, Kan.) Successful Engineers Scholarship

Donald Powers (Manhattan, Kan.) Engineering Scholarship, Kevin and Dianne Honomichl Civil Engineering Scholarship, Robert Callen King Award in Engineering

Robert Reilly (Overland Park, Kan.) Civil Engineering Excellence Scholarship, Engineering Scholarship, Walter M. and Alice K. Bellairs Scholarship

James Scott (Manhattan, Kan.) Ralph and Dora Rogers Memorial Scholarship

Garrett Sharpe (Lindsborg, Kan.) Albert Niu Lin Scholarship in Civil Engineering, Engineering Scholarship

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Vincent Studer (Frankfort, Kan.) Engineering Scholarship, Greg A. Tucker Leadership Scholarship, Paul Bartak Family Scholarship

Jenny Swabb (Basehor, Kan.) Engineering Scholarship, Loyal and Jill Huddleston Civil Engineering Scholarship

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Thomas Barret Wellemeyer (Derby, Kan.) Engineering Scholarship, Max E. Foote Scholarship

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Kurt Yoder (Welda, Kan.) Ralph and Dora Rogers Memorial Scholarship

Xinchi Zhang (Wuhan, China) Alfred Walton Johnson Memorial Scholarship, Engineering Scholarship



Competitors line up for the coed sprint concrete canoe heat. Mohammed Ali, Saudi Arabia; Brianna Krysztof, Baldwin, Kan.; Nathan Pohl, Hutchinson, Kan.; and Jenny Swabb, Basehor, Kan., second hull from top, race for K-State.

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