

Civil Matters

October 2007, Volume 7, Issue 1

Governor marks 100th anniversary of civil engineering

The department of civil engineering at Kansas State University was established by the Kansas Board of Regents in fall 1907, with the first classes in the curriculum offered in 1908.

The past 100 years have seen the art and science of civil engineering progress more rapidly than in any other period in history. The profession has gone from slide rules to calculators, from chains and transits to GPS, and from dirt roads to high-speed interstate highways.

In celebration of this centennial event, Kansas Governor Kathleen Sebelius and representatives from the K-State department of civil engineering joined in marking 2007–2008 as the 100th anniversary of the founding of the department.



Above, standing from left: Richard Hayter, assoc. dean; Brian A. Coon, UTC director; Sunanda Dissanayake, asst. prof.; Sarah Grotheer, graduate student; Richard McReynolds, KDOT; James Koelliker, interim head; Kathleen Strain, CE senior; Mbaki Onyango, graduate student; Joshua Lipscomb, CE senior

Seated: Governor Kathleen Sebelius

Left: Photo of document signed by the governor designating 2007 as the 100th anniversary of civil engineering at K-State.



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Wow, what a great time to return to CE! After 10 years in the biological and agricultural engineering department, I consider it an honor to now be serving as interim civil engineering department head.

In this issue of *Civil Matters*, we are adding some highlights of the 100th year of our department. Several graduates gave us their thoughts about the department and our profession. We will be celebrating throughout the year, and I hope you will find one or more ways to be a part of our activities.

I will show my age by a few of my recollections about the department. My first experience was in elementary surveying class in fall 1964. But, my most vivid recollection came when I was in Professor Wayne Williams' Soil Mechanics class in fall 1965—his first college class in his teaching career! I just presented Professor Williams' grandson, Ryan Williams, CE senior, with a scholarship check from the American Public Works Association.

This summer, I attended the Sesquicentennial in Hiawatha, Kan. Pictures of the main street around 1907, 1957, and today show how civil engineers have transformed our lives from dirt streets with horses and buggies, a windmill for the public water supply, privies for human wastes, and on and on. Now, even the smallest towns have so many conveniences and reliable infrastructure—all-weather roads, public water supplies, wastewater collection and treatment, and modern structures—that everyone takes so much for granted. It is very gratifying to recognize that civil engineers, many of whom our department has trained during the past 100 years, have been responsible for much of this progress.

As we look back and remember this year, I certainly am not implying that the work of civil engineers is done. We are benchmarking ourselves and recognizing a milestone along our path to the

future. The future holds much more promise for progress, and civil engineers will be at the core of society's progress. We have a huge infrastructure system to maintain and improve to support our civilization. New methods, techniques, and materials to make the future more effective, safe, and efficient will be developed.

New generations of civil engineers will need to be trained and retrained to make sure these improvements are designed, constructed, and maintained. I wish I could see 100 years ahead! I do know, however, that the parts of the next 100 years that I will be privileged to see will bring many opportunities and challenges that will make for exciting and rewarding times for all of our graduates and for all civil engineers.

My time as interim department head is short. We have begun the search process for the new head. By this time next year, I expect you will be reading news from that person. In the meantime, I hope you will continue to support our department as we continue our work and progress. Finally, I hope you will celebrate with us at one or more of our events this school year, our 100th!



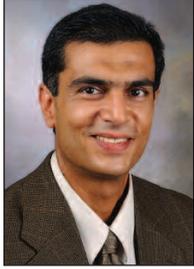
Koelliker

James K. Koelliker
Professor and interim head of civil engineering

Share your stories and photographs
(please include names when possible) connected with the Department of Civil Engineering for display at the 100th anniversary banquet: ce@ksu.edu
See <http://www.ce.ksu.edu> for details.

CE professor helps rebuild Kabul University

A mass exodus of faculty and students followed each of a series of tragic events in Afghanistan, which included the fall of the communist regime, a great civil war, and the rule of the Taliban. When K-State Professor Asad Esmaily arrived at Kabul University in 2006, much of the university had been decimated. Its infrastructure destroyed, the six-man team funded by the World Bank had one objective: reconstruct the school and return it to its position as the “flag ship” university in Afghanistan.



Esmaily

Established in 1947, the university is located in Kabul, Afghanistan. With an enrollment of more than 10,000, 25% of which are female, students study in fields including agriculture, economics, law, literature, science, engineering, and fine arts. The

faculty of the College of Engineering hosts more than 700 students—of which 30 are female. The college has four departments: architecture, civil, mechanical, and electrical engineering.

The department of civil engineering is currently focused on developing core curricula in road mapping, layout, water supply, and industrial park designs.

Esmaily says that the 10-year project will focus on the rehabilitation of the college of engineering building (including structural items, cooling and heating, emergency power, and refurbishment of classes, laboratories, library, and offices), rebuilding the library system, providing Internet connection, finalizing the



Prof. Esmaily meets with Kabul University faculty and students.

curricula for the college (civil, electrical, mechanical, and architectural engineering), short-term instructional training for the faculty there in class and laboratory teaching methods, and teaching sample sessions of representative courses by K-State faculty. Esmaily also noted that many of Kabul University’s faculty only have bachelor’s degrees, so there will be an effort to select qualified faculty members to continue their graduate studies at K-State to enhance their teaching and research abilities.

On a technical note—

“Top-strand effect”—prestressed concrete progress

For the last two and a half years, CE Assoc. Professor Robert Peterman has been visiting precast concrete plants all over the United States in an effort to study the use and effects of self-consolidating concrete (SCC) on the precast industry. SCC refers to a standard- or high-strength cementitious concrete mixture that is highly workable and can flow through densely reinforced and geometrically complex structural elements under its own weight—filling the voids without segregation or excessive bleeding. Because of these qualities, which make SCC extremely cost-effective in precast plants, its usage has become commonplace in the industry.

However, the “top-strand effect” has not been thoroughly researched when using SCC. The top-strand effect is the increased development length needed in

strand cast toward the top of deeper members, generally attributed to the combined effects of bleed water and settlement.



Peterman

Peterman’s study, which was funded by the Precast/Prestressed Concrete Institute (PCI) and the Kansas Department of Transportation, indicated that average transfer lengths for members cast within 2 in. (50 mm) of the top surface were, on average, more than 60% longer than the amount currently assumed by design engineers (50db).

Peterman also received funding for the study from the following companies: A. L. Patterson, American Spring Wire, Axim Italcementi Group, BASF Admixtures,

Consulting Engineers Group, Coreslab Structures, Grace Construction Products, High Concrete Group, Metromont Corp., Molin Concrete Products, Shockey Precast Group, Sika Corp., Spancrete Industries, Strand-Tech Martin, Stresscon Corp., and Tindall Corp.

Peterman’s article, describing “The Effects of As-Cast Depth and Concrete Fluidity on Strand Bond,” was published in the May-June 2007 edition of the *PCI Journal*.



Steel bridge team at nationals at Northridge, Calif., from left to right: Chad Banka, John Handke, Brian Coomes, Trevor Fenton, Brady Hedstrom, Kurt Hershey, Wilson Smith, Josh Lipscomb, Cody Cates, Steven Hammerschmidt, Joey Holste, Tyler Ummel, and Doug Duncan. *Not pictured:* Tim Davidson, Brandon Decker, L.J. Dickens, Tony Dowling, Eric Dvorak, Kevin Friedrichs, Elizabeth Rawson, Pat Sheedy, Nathan Winkley, and Hani Melhem, team advisor.

ASCE/AISC student steel bridge competition

The American Institute of Steel Construction (AISC) and the American Society of Civil Engineers (ASCE) Steel Bridge Competition is the premiere intercollegiate steel bridge competition, where civil engineering students design, fabricate, and construct a model steel bridge. The bridge is then judged on a variety of qualities including stiffness, lightness, aesthetics, economy, efficiency, and time to assemble.

This year, K-State's civil engineering's steel bridge team ranked second at the regional competition with first place in aesthetics and—for the third year in a row—was one of the 43 teams nationwide to make it to nationals in Los Angeles.

The team assembled their bridge, which must be assembled from components as part of the competition, in a mere 7.18 minutes.

The team's faculty advisor is CE Professor Hani Melhem.



Students work building their concrete canoe, clockwise from lower left: Bridget Walsh, Matt Schultze, Sarah Burford, Damian Rottinghaus, Bryan Donze, Kyle Larson, Patrick Sheedy, Stephen Harris, Trevor Ahring, Paul Bruss, Sarah Grotheer, Kishore Gorle, Josh Gamage, and Ken Kuehne with William Byer by the cabinet. *Not pictured:* Lauren Brown, Brian Geiger, Kait Howard, Scott Johnson, Matthew Schultz, Amanda Sixbury, and Jeremiah Thomas.

Concrete canoe competition

Each year, members of K-State's ASCE student chapter trade their pencils and calculators for oars and life jackets in order to participate in ASCE's National Concrete Canoe



Competition. For the event, each school must build a canoe made out of actual concrete, which must adhere to certain criteria in regards to quantities and quality of certain aggregates, admixtures, and concrete in the team's mix design. The concrete canoe must also meet certain physical dimensions in regards to length, width, and height.

In addition to the technical side of the competition, each school must have a theme and name for their canoe, and students give presentations that describe the methods of how their canoe was made and how the concrete mix was designed.

The day after the presentations, schools race their canoes against each other. The school with the most points combined from the presentation, paper, and races wins. The first-place team advances onto the national competition.

This year, the competition was held at the University of Kansas in Lawrence. Co-chairs, Paul Bruss and Bryan Donze, were both excited about the team's performance, coming in fifth, and hope the team makes it to the national competition next year.

UTC to coordinate transportation research

K-State has been designated to host a Tier II University Transportation Center (UTC) by the U.S. Department of Transportation (DOT). The center, funded by a partnership between Kansas and U.S. DOTs, will coordinate transportation research and educational efforts at K-State.

The center's theme, "The Sustainability and Safety of Rural Transportation Systems and Infrastructure," focuses on transportation needs of rural states, such as Kansas.

"Rural transportation is a critical issue. While only about 40 percent of all vehicle miles are traveled on rural roads, about 60 percent of traffic accident fatalities occur on these roads," said Brian A. Coon, UTC director at K-State. "When adjusted for miles traveled, the fatality rate from traffic accidents on rural roads is nearly two and a half times greater than the fatality rate from accidents on urban roads."

The center's associate director, Dr. Renee Slick, a psychologist, supplies the human factor aspects to transportation engineering. "We need to focus not only on the technical aspects of transportation, but also on the human element," said Slick.

One project of the center is to develop a mobile transportation laboratory, which can provide a facility for researchers to analyze structures in the field as well as providing a method of getting high school students interested in choosing transportation engineering as a career path.

The center's strategic plan, recently approved by USDOT, is available on line at the center's Web site, <http://transport.ksu.edu>.



Professor Robert Peterman with the mobile laboratory

The site also describes activities of the center. The center's email address is utc@ksu.edu.

Center director Brian A. Coon holds a B.S. in mechanical engineering, an M.S. in civil engineering, a Ph.D. in engineering, and a law degree. A Fulbright Scholar in 2000, he studied European standards for roadside safety testing at the Swedish Road and Transport Research Institute in Linköping, Sweden. He is licensed in both civil and mechanical engineering in Nebraska, and is licensed in Kansas. He is licensed to practice law in Colorado, Kansas, and Nebraska and the Federal District Court for the District of Kansas.

UTC Advisory Committee members

The following individuals have volunteered their time and expertise to help guide the University Transportation Center in its efforts to further transportation research. The center, its director, and the entire CE department wish to offer their thanks to the following individuals:

- J. Michael Bowen, *Federal Highway Administration*
- Keith Browning, *Douglas County Public Works*
- E. Dean Carlson, *Carlson Associates*
- Lt. Gregory Harkrader, *Kansas Highway Patrol*
- Leon Hobson, *Riley County Public Works*
- James Jones, *Kansas Asphalt Pavers Association*
- W. Michael Lackey, *Kansas Dept. of Transportation (Ret.)*

- Paul Malir, *TranSystems Corporation*
- Richard McReynolds, *Kansas Dept. of Transportation*
- Edward J. Mulcahy, *TranSystems Corporation*
- Robert Thorn, *Finney & Turnipseed, L.L.P.*
- Joanie Roeseler, *Federal Transit Administration*
- Matt Ross, *American Concrete Pavement Association*

2007–2008 UTC RESEARCH PROJECTS

The following projects were selected for funding by the UTC Advisory Committee. Individuals with interest in these projects are welcome to contact the investigators or the center director to help contribute their experience, expertise, or knowledge to the projects.

Primary investigator	Research topic
Peterman	Establishing a mobile laboratory for transportation research and education
Rys and Russell	Promoting center-line rumble strips to increase rural, two-lane highway safety
Dissanayake	Factors affecting fatal crash involvement of older drivers
Hossain and Testa	Kansas pavement preservation initiative
Russell	Increased pedestrian safety and decreased motorist delay with a HAWK pedestrian signal
Rys and Russell	Effectiveness
Dissanayake and Stokes	Improving usage of demand response transit services in rural Kansas
Najjar, Dissanayake, and Romanoschi	Knowledge discovery in transportation databases (KDiTD)

A CENTURY OF PERSPECTIVE AND EXPERIENCE

Three prominent K-State civil engineering alumni were asked to share their perspectives on a century of change.



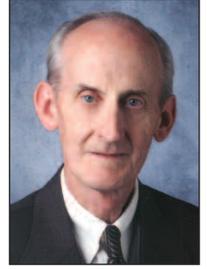
Lackey

Transportation engineering

W. M. (Mike) Lackey, P.E. ('63, M. S. '75)

So the big question is, have we improved and advanced in transportation engineering in the last one hundred years? I have to say—absolutely! If an engineer is a person who puts the knowledge and rules of science to practical use for the good of mankind while recognizing economic constraints, then our product has improved immensely. Our “customer,” the owner and/or the public, is

receiving a product that is more efficient, less intrusive on society and the environment, and serves a longer life. I expect that the engineer of 2107 will look back and consider our means and methods as rudimentary as we consider the 1907 environment.



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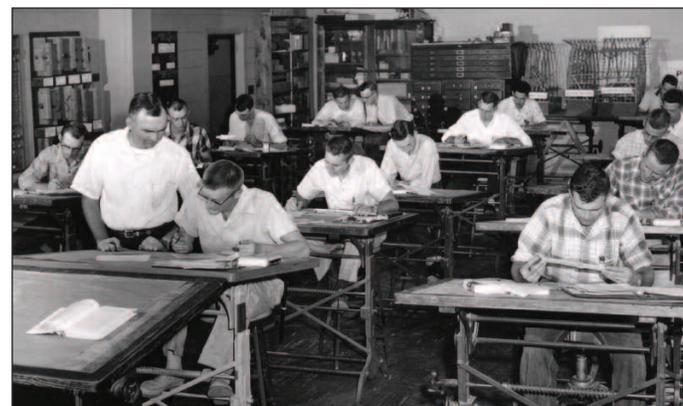
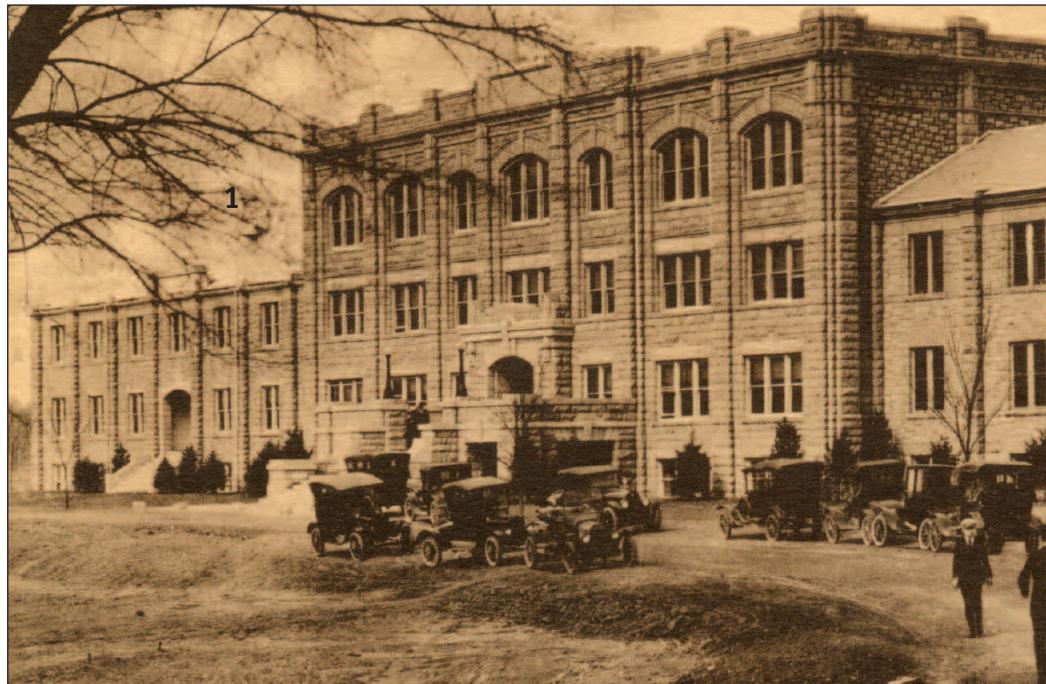
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100 years of diverse personalities and

In the fall of 1907, the Kansas Board of Regents voted to establish a curriculum in civil engineering. The department of civil engineering at K-State began its work in 1908, when the first curriculum was offered in the field. The first class—seven men—graduated with B.S. degrees in civil engineering in 1910. The first M.S. degree in civil engineering was granted in 1926.

The first department head was Lowell E. Conrad, who served the department nearly 40 years, retiring in 1946. He saw CE through two World Wars, the Depression, and development of the department from its infancy.

Taking over from 1947 until 1963, Reed F. Morris continued to expand the department, adding courses in hydraulic engineering and soil mechanics. Morris also was chair during the construction of the Seaton Hall West Wing addition,



EXPERIENCE—K-STATE CIVIL ENGINEERING

Structural engineering

Bert Thorn, P.E. ('50)

The first recognized specifications for highway bridges were published in 1931, but did not include loads for a tractor-trailer—because they were non-existent! When I graduated from K-State in January 1950, the latest book in use was the *Fifth Edition, The 1949 Standard Specifications for Highway Bridges*, adopted by the American Association of State Highway Officials (AASHO). This edition contained 89 pages of specifications covering design for steel, concrete, and timber. Steel was limited to ASTM A6, which was later declared non-weldable because of the high carbon content. Steel rated for 18,000 psi in tension. Concrete with compressive strength had been developed, but no one local was capable of delivering concrete with design strength for concrete was 3,000 psi. Of course, pre-stressed concrete was not invented yet.



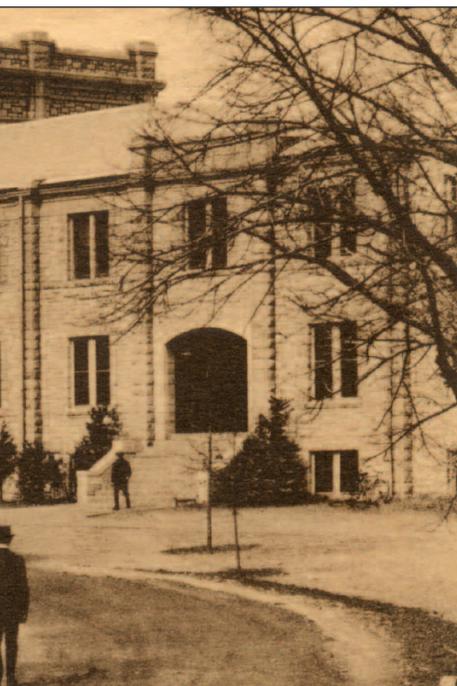
Scherer

Environmental and water resources

Matt A. Scherer III ('79, M.S. '83)

Despite the changes the past century of practice has undergone, the same fundamental challenges exist: reducing the impact of flooding on human beings, providing clean water for human use, and getting water from where it is to where it is needed. What has changed the most are the tools that are available to engineers and the complexity of future challenges. These future challenges include serving a significantly larger population—a population that has much greater expectations, the ongoing and accelerating changes to our watersheds, and the increased value that society places on environmental preservation and protection.

Talent at the helm of civil engineering



Above: During the 1920s, the street in front of the engineering building was a dirt road. **Far left:** The aircraft pictured on the front lawn of Seaton in 1921 is a French-built Spad XIII, World War I pursuit plane, also flown by American airmen, including ace Eddie Rickenbacker. **Left:** Note the lack of computers, and use of trusty sliderules in 1950s engineering class.

which was the first reinforced concrete building on the K-State campus.

From 1963 to 1972, the department was headed by Jack B. Blackburn, who saw CE through the tumultuous era of the Vietnam War, working to develop a civil engineering doctoral program.

Robert R. Snell became head of the department in 1972. Under Snell's lead, many of the courses offered in the applied mechanics department—as well as its professors—were absorbed by civil engineering. Statics and Mechanics of Materials, from that point on, have been taught in the department. Snell was also the Big Eight National College Athletic Association (NCAA) faculty representative, focusing a great deal on service to the college.

In 1992, Stuart Swartz became head of the department, focusing on distance education and beginning the cooperative master's program offered between K-State and KU in Topeka. He also developed the CE advisory council, which still helps guide the department long after Swartz's retirement as head in 1999.

Lakshmi N. Reddi became department head in 1999, developing the geo-environmental certificate program and helping begin the University Transportation Center.

Currently, James Koelliker is serving as interim head, as the department seeks out an individual with the same dedication to and tenacity for the department. Last year, civil engineering graduated 34 students—30 men and four women.

SAVE THE DATE

Friday, April 18, 2008

Engineering Open House

2:30–9:30 p.m.

CE Centennial Banquet

6:00 p.m. *Clarion Hotel*

Saturday, April 19, 2008

All-University Open House

9:00 a.m.–3:00 p.m.

Reminisce and Remember

9:30 a.m. *Fiedler Hall*

Informal CE luncheon

noon

For more information, or if you are interested in helping support the CE Centennial Celebration, visit the CE Web site at <http://www.ce.ksu.edu> or contact Jim Koelliker at koellik@ksu.edu or at 785-532-1586.

FACULTY AND STAFF NEWS



Melhem

Hani Melhem, professor of civil engineering, has become the chair of the Executive Committee (EXCOM) of the Technical Council on Computing and Information Technology of the American Society of

Civil Engineers for 2007–08. He is also vice-president of the ASCE Global Center of Excellence on Computing. Melhem served as vice-chair of EXCOM in 06–07 and was also the ASCE representative on the organizing committee and one of three co-editors for the proceedings of Joint International Conference on Computing and Decision Making in Civil and Building Engineering, held in Montreal, Canada.



Najjar

Yacoub Najjar, professor of civil engineering, was selected for the 2007 Who's Who Among American Teachers and Educators.

Brian A. Coon, associate professor of civil engineering and director of the newly established University Transportation Center, was awarded the Transportation Research Board's Practice-Ready Paper Award for the paper, "Guardrail Length," at the 2007 Annual Meeting of the Transportation. Coon, a licensed attorney



Coon

in Colorado and Nebraska, also passed the Kansas bar exam in February and was sworn in as a Kansas attorney in April.

Robert W. Stokes, professor of civil engineering, has been elected to the position

of ASCE Region 7 Society Director. Region 7 consists of ASCE entities (sections, branches, and student chapters) in Colorado, Wyoming, South Dakota, Nebraska, Iowa, Missouri, and Kansas.



Stokes

The society director serves as chair of the ASCE Region 7 Board of Governors and is a voting member of the national board of direction. The society director position is a four-year term.

Stokes will officially assume his responsibilities at the ASCE Annual Conference in Orlando, Fla., in October 2007.

Civil engineering professors continually seek opportunities to learn new techniques to improve the teaching-learning process and make classes more interactive. Last summer, **Sunanda Dissanayake**, civil engineering assistant professor, participated in the highly regarded ExCEED Teaching Workshop organized by the American Society of Civil Engineers, held at the University of Arkansas, Fayetteville.



Dissanayake

Named for Excellence in Civil Engineering Education, ExCEED is a one-week program that covers such topics as principles of effective teaching and learning, different learning styles, communication skills, learning objectives,

class organization and course organization, development of good interpersonal rapport with students, teaching with technology, and classroom assessment techniques within the context of civil engineering. Dissanayake has found the ExCEED model concepts extremely useful and has started applying some of the ideas to her classes. This year, she was invited as an assistant mentor of the 2007 ExCEED Workshop, which was held at the University of Northern Arizona.



Wahl

Debi Wahl has joined civil engineering as the department's accountant. Prior to coming from the summer school office of the provost at K-State where she was a senior administrative specialist, Wahl had spent nearly two

decades as the bookkeeper and assistant manager of the Riley Elevator in Riley, Kan.

STUDENT AWARDS

Monica Palomo, graduate student of Professor Alok Bhandari, received a 2007 Environmental Chemistry Graduate Student Award. Nominated by her adviser, Palomo was one of 19 national recipients of the award, given by the American Chemical Society's Division of Environmental Chemistry. She is currently working toward a doctorate in civil engineering with an emphasis on environmental engineering.

Brock Baxter received the Kansas County Highway Association Award, a \$1,000 scholarship.

Peter Foltz was awarded both the \$1,425 Wildcat

Construction Scholarship and the \$1,000 Kansas County Highway Association Award.

Shaun Quigley studied abroad at the Czech Technical University in Prague, Czech Republic in the spring of 2007.

Damian Rottinghaus received the \$1,425 Wildcat Construction Scholarship.

Ryan Williams received the \$1,000 American Public Works Association (APWA) Award.

ASCE student chapter news

Josh Lipscomb, president, ASCE Student Chapter



Lipscomb

The Kansas State University student chapter of the American Society of Civil Engineers (ASCE) kicked off the fall 2006 semester by hosting a mixer for students, faculty, and staff. Fall and spring 2007 picnics at Tuttle Creek were also well attended.

K-State hosted the KU/K-State ASCE Joint Dinner in the K-State Union in the fall semester, allowing students from both universities to share tips about developing successful ASCE chapters and to get to know each other.

The concrete canoe and steel bridge teams spent

much of the year preparing for regional competition in Lawrence. Both were highly successful, winning a large majority of the events.



K-State's ASCE chapter also participated in intramural softball, and service projects such as highway cleanup on Highway 24 and food donations to the Flint Hills Breadbasket.

ASCE plans to build on this successful year by adding activities to increase interaction between the students and the community. The organization also will be joining the CE department this fall to celebrate 100 years of civil engineering at K-State.

ITE chapter introduced at K-State

Kyle Warta, president, ITE Student Chapter



Warta

This fall, we are excited to introduce the Institute of Transportation Engineers (ITE) Student Chapter to Kansas State University. K-State will be among the 130 student chapters around the world. With the help of Brian Coon, associate professor in the department of civil engineering, this organization will provide student members with a strong connection to professional engineers throughout the Midwest.

A wide variety of speakers will provide students with a greater knowledge of transportation engineering, as well as present transportation product demonstrations. This relaxed hands-on atmosphere will allow students to develop knowledge about upcoming products used in everyday design. One of ITE's main goals



is to provide members with the correct knowledge and tools required for life after college. Students will be provided with mock interviews as well as resume-building sessions to ensure the success of all members.

This close-knit organization will allow licensed professional engineers in the Midwest, as well as student members at K-State, to create relationships within the civil engineering community. In addition to speakers, ITE will provide members with several service projects within the Manhattan area, field visits to local transportation engineering sites, and the opportunity to attend national transportation conferences. ITE is looking forward to a strong first year at K-State as well as in the community

Chi Epsilon—Civil Engineering Honor Society

Steven Hammerschmidt, president, Chi Epsilon Chapter



Hammerschmidt

The K-State Chi Epsilon Chapter has been quite busy with the recent induction of 12 new members. Along with the new initiates, the K-State chapter selected two members, Douglas G. Smith, chief planning officer for MWH Global, Inc., and Stephen Berland, president of BG Consultants, Inc., to chapter honor member status.

To help the new initiates and other Chi Epsilon members understand what Chi Epsilon is and to bring new ideas to campus, three members, Bryan Donze, Brian Coomes, and Damian Rottinghaus, attended the Regional Conclave at the University of Arkansas, Fayetteville. They came back with many ideas including successful fundraiser in

which letters were sent out to alumni asking them to donate a dollar for every year out of school.



Each semester Chi Epsilon members set out to maintain a stretch of trail at Tuttle Creek State Park. Chi Epsilon has been helping to maintain the trail for the past two years. Much of the work done is clearing overgrown trees and spreading mulch along the path. In addition, each semester an initiation ceremony is held with the fall ceremony held in conjunction with the CE banquet. The chapter ended the 06-07 school year with a barbeque in Manhattan City Park, where new officers were elected and ideas exchange for the 07-08 year.

Civil Engineering Professional Academy: '06-'07 members

The Civil Engineering Professional Academy recognizes individuals and businesses that partner with the department of civil engineering in order to impact civil engineering education and to personally interact with the department leadership, faculty, and students. Membership is extended through invitation from the CE department head and the dean of engineering. Individual members in the academy make annual contributions of

\$250; those making annual contributions of \$500 or more are recognized as executive members by the academy and as colleagues by the College of Engineering Seaton Society. Corporate members contribute \$2,500 or more annually, and those who make one-time contributions of \$25k or more are continually recognized as permanent founders of the academy.

CORPORATE MEMBERS

Bartlett & West Engineers, Inc.
BHC Rhodes
CAS Construction, Inc.
Citgo Petroleum Corporation
ExxonMobil Foundation
Portland Cement Association
Sprint Foundation
Wildcat Construction Co., Inc.

Ruth Coonrod
Max & Linda DaMetz
Leslie Doty
Larry Emig
Philip Frazier
Michael Gard
Matthew & Tara Gazaway
Darwin & Beverly Guinn
Nolan Hake
Kevin & Dianne Honomichl
Ray Kennedy
Jill Kueker
Mike & Vera Lackey
Jeffrey & Joy Lessman
Thomas Lindley
Ed & Jeanne Mulcahy, Jr.

Tom & Connie Paulson
Robert Ritter
Bret Rose
Randall Sedlacek
Douglas & Cynthia Smith
Bob & Lila Snell
Bill & Susan Stannard
Richard Steele
Alan & Sharon Sylvester
James & Marty Tadtman
Bob & Bernita Thorn
Leland Tice
Mary Ventura
Lloyd & Rene Weller
Don & Treva Wiruth
Craig Young

INDIVIDUAL MEMBERS

Walter Bellairs
Bill & Genevieve Brungardt
Carl & Donna Coonrod
Randall & Jacqueline Coonrod

DISTANCE LEARNING

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 on line 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 towards earning your professional engineering license. For information on earning your license, go to the Kansas Board of Technical Professions on line at <http://www.kansas.gov/ksbtp/>.

Fall 2007

CE 654 Design of Groundwater Flow Systems
CE 751 Hydraulics of Open Channels
CE 766 Wastewater Engineering: Biological Processes
CE 775 Traffic Engineering
CE 776 Pavement Performance and Management Systems
CE 786 Land Development for Civil Engineers and Planners
CE 790 Prb/Responsibility in Engineering II: Leadership and Diversity
CE 802 Advanced Mechanics of Materials
CE 861 Environmental Engineering Chemistry

Spring 2008

CE 680 Economics of Design and Construction
CE 703 Responsibility in Engineering
CE 743 Advanced Reinforced Concrete Theory
CE 752 Advanced Hydrology
CE 762 Water Treatment Processes
CE 774 Pavement Design
CE 822 Shear Strength and Slope Stability of Soils
CE 828 Advanced Soil Mechanics
CE 866 Advanced Wastewater Treatment
CE 872 Transportation Safety

Contact: Division of Continuing Education
131 College Court Building
Manhattan, KS 66506-6001

Email: info@dce.ksu.edu
Web: <http://www.dce.ksu.edu/engineering/degrees/civil/>
Phone: 1-877-528-6105

CEdoku

Civil engineering sudoku

Each sudoku puzzle has a unique solution that can be reached logically and without guessing. Enter digits from 1 to 9 into the blank spaces. Every row, column, and 3x3 square must contain one of each digit. The solution is on line at the CE department Web site at <http://www.ce.ksu.edu>.

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	8		3			2		
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	1			5			8	
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		8			6		5	
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7			1		5		2	

				3					
	4	9	2						
		3		8	7			9	
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	5		3	4		6			
					2	3	5		
				9					

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