

IOWA STATE UNIVERSITY

Civil, Construction, and Environmental Engineering

2007-2008

CCEE highlights



CCEE

www.ccee.iastate.edu

Mission and Vision

The Department of Civil, Construction, and Environmental Engineering (CCEE) at Iowa State University desires to be a world-class source of civil, construction, and environmental engineers, concepts, and technologies. The CCEE department:

- promotes intellectual, social, and ethical development of civil and construction engineers
- creates and communicates engineering concepts and technology

Objectives

Our departmental curriculums are designed to prepare students for successful lifelong careers which inevitably will be faced with constantly changing technical and managerial challenges. The following degree-specific objectives have, therefore, been established for graduate capabilities and perspectives within the post-graduation time frame of three to five years into their careers.

Civil and Environmental Engineering

- Comprehensive education in the fundamentals of civil engineering
- Preparation to undertake civil engineering design tasks
- Demonstrated ability with effective communication skills and teamwork in multidisciplinary projects
- Ability to play a constructive role to address the needs of society and the environment
- Motivation to continue professional development

Construction Engineering

- Broad foundation in mathematics and physical sciences
- A base of engineering and design knowledge and application appropriate to the student's chosen option of building construction, highway and heavy construction, or electrical and mechanical construction
- Basic knowledge in construction process designs, cost estimating, planning, scheduling, and risk assessment
- Basic knowledge of contracts, law, business organization, principles of management, and ethical reasoning
- Effective oral, written, and graphical communication abilities to effectively communicate with engineers and non-engineers
- Ability to use current technology to meet the above objectives



Learn more about our mission, vision, objectives, and outcomes online at www.ccee.iastate.edu/who-we-are.

CCEE

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

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For more information about Iowa State University and the Department of Civil, Construction, and Environmental Engineering, please visit us online at www.ccee.iastate.edu.

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CCEE Poised for Current, Future Success

Perhaps the biggest news from our department this year is the remarkable increase in our undergraduate enrollment. Our construction engineering program posted a 7 percent increase and civil engineering posted an 8 percent increase in enrollment. This is the largest enrollment increase the Department of Civil, Construction, and Environmental Engineering (CCEE) has seen in the last seven years, and it represents 11 percent of the enrollment increase at the university. Of course this, along with record participation by employers in our career fair, national recognition of our talented faculty, and the kick off of our distance education graduate program continues to prove that the road to CCEE's success is well-paved with many good signs.

This year, our fall engineering career fair yet again drew record numbers of employers, and nearly half of them (189 out of 389 total) were hoping to hire our outstanding CCEE graduates. This provides a sure sign to our incoming students that an education in civil, construction, and environmental engineering is a hot ticket. And this fair surely helps us maintain our nearly 97 percent job placement rate for our graduates.

The world-class education we provide to students is clearly evident in the recognition our faculty have received on the national scene. Within just the past year, faculty **Larry Cormicle** and **Kelly Strong** were recognized as best-in-the-nation educators by the Associated General Contractors of America (AGC) and Design-Build Institute of America, respectively. Additionally, the American Society of Civil Engineers honored Associate Professor **David White** with the society's top award for young geotechnical researchers, and the American Academy of Environmental Engineers awarded the group's top research prize to Professor **Hans van Leeuwen** and his research team. The vast majority of our faculty have a PE license to confirm their professional quality, and two are even LEED accredited. Our research dollars also are increasing—helping our faculty continue to excel in their work.

In addition to winning national honors, our faculty have been sought after by national media seeking their expertise for articles featuring their areas of specialization. Faculty who have been covered prominently in national media include van Leeuwen for biofuels, **Terry Wipf**, **Brent Phares**, and **Lowell Greimann** for bridge design and safety; **Max Porter** for masonry systems, **Halil Ceylan** for waste lignin reuse, and **Sri Sritharan** for seismic engineering.

Our new AGC-accredited distance education graduate program for construction engineering and management and courses from the program were featured in two well-respected national trade magazines: *Engineering News Record* and *Professional Surveyor Magazine*. Our GPS automated grade control course, which was the first-of-its-kind course when it was introduced into our on-campus program two years ago, will soon be offered to engineers living anywhere around the world via our distance education program.

Lastly, students in our program have begun to use new study and learning spaces that were renovated last year: the Kiewit Student Study Center and Highway Design Classroom. These facilities provide students with a first-rate learning environment and offer them space to collaborate with other students on projects, organize events for student organizations, and more.

Best regards,



James E. Alleman
Department Chair and Professor



James E. Alleman

CTRE Welcomes New Director

The new director of Iowa State University's Center for Transportation Research and Education (CTRE), **Shashi Nambisan**, started his position last February.

Nambisan came to Iowa State from the University of Nevada, Las Vegas where he directed the Transportation Research Center and was a professor in the department of civil and environmental engineering.

Nambisan comes to Iowa State after directing the transportation center at the University of Nevada, Las Vegas for eight years. He was also assistant director from 1993 to 1998. He has a bachelor's degree in civil engineering from the Indian Institute of Technology in Madras, a master's degree in civil engineering from Virginia Tech, and a doctorate in civil engineering from the University of California, Berkeley. His research interests include transportation safety, risk analysis, transportation planning,

infrastructure management, and air transportation.

Nambisan, who also is a professor of civil, construction, and environmental engineering, says he's excited about the "three P's" at Iowa State's transportation center—the people, programs, and partnerships.

"The Center for Transportation Research and Education has an excellent complement of all of these," he says. "The center's potential for future growth and continued impact is great."

The Center for Transportation Research and Education at Iowa State was established in 1983 as one of the Federal Highway Administration's original Rural Technical Assistance Programs. The center conducts transportation research, educates transportation students, and offers national, regional and local transportation services and programs. ■

—Courtesy ISU News Service



Shashi Nambisan

Agreement Allows Egyptian Students to Earn PhDs at Iowa State

Officials from Iowa State University and the Egyptian Cultural and Educational Bureau (ECEB) in Washington, DC, signed an agreement last May to encourage Egyptian students to pursue doctoral degrees at Iowa State. The agreement allows any Egyptian graduate student receiving a scholarship from ECEB to pursue his or her doctoral degree at Iowa State for in-state tuition rates. The agreement

covers all PhD granting disciplines at the university and will create a stream of very well-qualified doctoral students to enhance Iowa State's and the CCEE department's graduate student body.

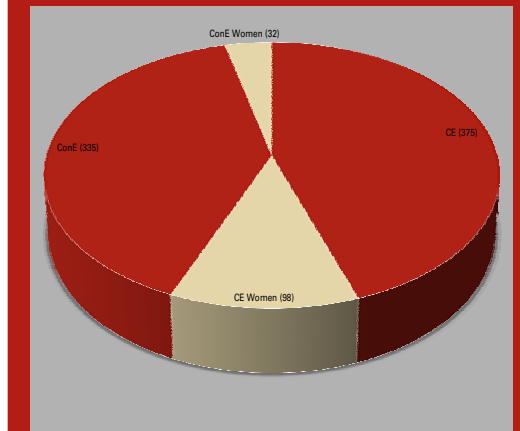
CCEE Department Chair **James E. Alleman** and Assistant Professor **Amr Kandil** led the Iowa State group that drafted the memorandum of agreement. ■

Enrollment Jumps

The CCEE department's undergraduate enrollment saw its largest increase in the past seven years. Construction engineering enrollment increased 7 percent and civil engineering enrollment rose 8 percent. This increase is in response to new recruitment efforts by the department targeting prospective undergraduate students.

Graduate enrollment increased slightly, too.

Total Enrollment 2007-08*



*These numbers are based on Fall 2007 enrollment, 10 days after classes began. Another 46 students transferred from other departments into CCEE later in the fall semester.

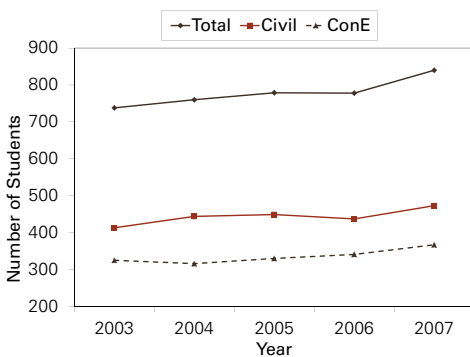


Abdallah S. Bazaraa, counselor and director of the Egyptian Cultural and Educational Bureau (left) and David K. Holger, associate provost for academic programs and dean of the Iowa State Graduate College (right) sign the Memorandum of Agreement.

CCEE Student Enrollment Trends

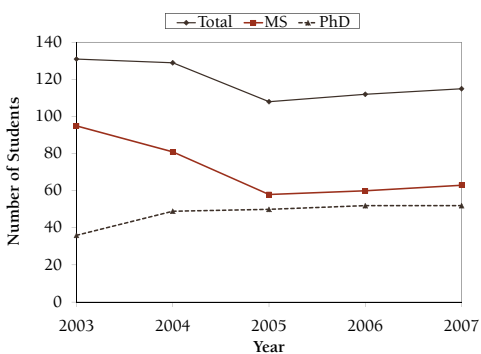
Overall, the CCEE department's undergraduate and graduate student populations have been increasing for the last few years. The following graphs break down the data.

Undergraduate Enrollment



Undergraduate enrollment jumped this year, increasing 7 percent for construction engineering and 8 percent for civil engineering students.

Graduate Enrollment



Our total graduate student enrollment increased 3 percent. The CCEE department is currently developing recruitment material targeted at prospective graduate students.

CCEE Offers New Online Grad Programs

The CCEE department now offers two of its graduate programs—Environmental Engineering and Construction Engineering and Management—completely online through Engineering Distance Education (EDE). The new online programs make it more convenient and cost-efficient than ever for professionals to attain a master's degree or certificate.

The **graduate certificate in environmental engineering** allows students to improve their technical skills through advanced study without committing to a full master's program. Students will learn more in the growing field of water supply, wastewater treatment, environmental protection, recovery of byproducts, and improved management of wastes. The certificate consists of 12 credits (4 courses).

The **master's degree in construction engineering and management** provides a unique blend of technical and managerial education to help professionals solve prob-

lems and compete in the ever-changing construction environment. The program, endorsed by the Associated General Contractors of America, focuses on three components: management techniques, construction operations, and construction methods. Instead of a traditional master's thesis, students will develop a project paper in conjunction with their employer that explores a project or process improvement. Students may complete this 30 credit degree program in approximately two years (four semesters and two summers).

Courses are delivered via streaming media over the Web, ftp download, or on CD. Students may choose the day, time, and location to view their class lectures, allowing for maximum flexibility. All students, regardless of location, are assessed in-state tuition for the online programs. Up to nine credit hours can be taken as a non-degree student. For more information about the programs, visit www.ede.iastate.edu.

CCEE Welcomes Students from China

The CCEE department welcomed 15 students from Lanzhou Jiaotong University in the People's Republic of China's Gansu Province to campus in June by hosting a picnic for the students. Nine other students from Lanzhou have been on campus since last year.

Iowa State's CCEE department and Lanzhou Jiaotong University established a partnership in 2001 to create a dual-degree program in civil engineering. Since then, the CCEE department has enrolled students from China, engaged Iowa State faculty with education and research opportunities in China, and involved Iowa State engineering students in gaining a global perspective.

Students in the program complete the first two years of the curriculum at Lanzhou Jiaotong University. They finish their final two years at Iowa State. Once they've successfully completed the programs, they receive a bachelor's degree in civil engineering from both universities.



Students from the first (top) and second (bottom) group of exchange students from Lanzhou, China.

AGC Students Continues to Win Top Honors

The Iowa State University Associated General Contractors of America (AGC) student chapter continued its strong showing in national and regional competitions this year. Here's a recap of the year's major events:

March: Two Iowa State teams competed at the Associated Schools of Construction(ASC)/Associated General Contractors (AGC) of America National Student Competition in San Antonio, Texas. The design/build team placed third and the commercial team performed well, but didn't place in the top three.

Additionally, for the second year in a row, the AGC student chapter sent several members down to Mississippi during spring break to help with rebuilding efforts from Hurricane Katrina. This year, 36 students helped families in southern Mississippi hang sheetrock, roof homes, frame houses, and remove debris. A blog from the trip is online at www.ccee.iastate.edu/students/2007-spring-break-blog.html.

September: For the third consecutive year, the Iowa State AGC chapter was named the Outstanding Student Chapter of the Year. In the past year, Iowa State AGC members participated in numerous community service activities, such as assisting with Habitat for Humanity, Friendship Ark Homes, and Relay for Life in Ames; and collecting items for Toys for Tots. The group also engaged in professional activities by hosting industry speakers at its monthly meetings, going on several job site tours, and attending an OSHA training.

October: The student group competed at the ASC/AGC Region IV Competition in Nebraska City, Nebraska. Four teams received top honors: the commercial, design-build, and residen-



Barry E. Pacely, member of AGC's Education Committee (left) presents the Outstanding Student Chapter of the Year Award to Mike Grim, AGC student chapter president (center) and Larry Cormicle, AGC faculty adviser (right).



Iowa State AGC students stand in front of their camp in Mississippi, where they helped rebuild homes destroyed by Hurricane Katrina.

tial teams placed first and the heavy/civil team placed second. The commercial and design-build teams will compete in the Associated General Contractors (AGC) of America/ASC National Student Competition held during the AGC of America National Convention March 2008 in Las Vegas, Nevada. The first place residential team will compete at the Residential Construction Competition at the National Association of Home Builder's International Builders' Show February 2008 in Orlando, Florida.

Larry Cormicle (BS ConE '78), a senior lecturer in construction engineering, coached all four teams prior to and during the competition. ■

White Named to New Endowed Professorship

In 1991, Iowa State University basketball legend and civil engineering alumnus **Waldo Wegner** (BSCE 1935) and his wife, Katie, committed a large gift to Iowa State University to fund a professorship in civil engineering, a scholarship in the College of Family and Consumer Sciences (now the College of Human Sciences), and a men's basketball scholarship. The endowed professorship is now becoming a reality as **David White**, associate professor in geotechnical engineering, becomes the inaugural recipient of the Waldo W. Wegner Professorship in Civil Engineering.



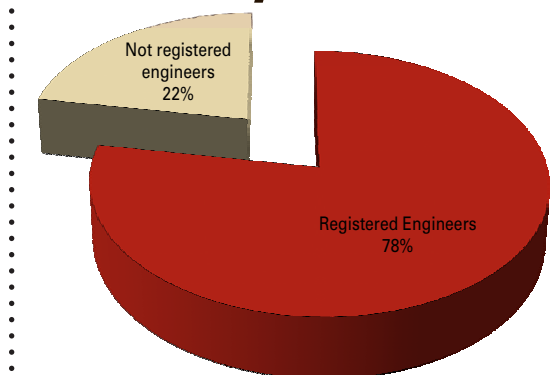
David White



Waldo W. Wegner

"I'm honored to be selected as the first recipient of this professorship," says White. "My goal is to use this professorship as a catalyst for inspiring undergraduate students to become more engaged in experimental research." White will serve in this professorship for three years. ■

Registered Engineers on Faculty

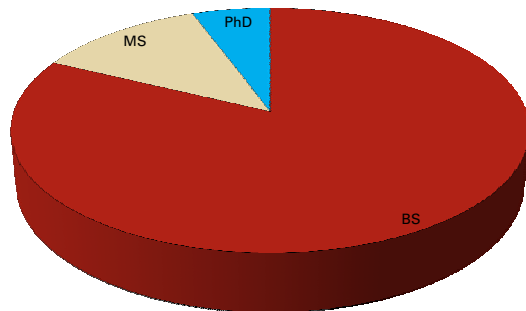


Nearly 78 percent of our faculty are registered engineers. Two faculty are LEED accredited.

Degree Trends

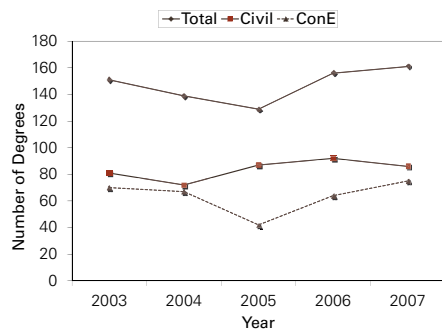
The following graphs and charts show the number of bachelor's of science degrees and graduate degrees awarded in 2007-2008.

Overall Degrees Awarded



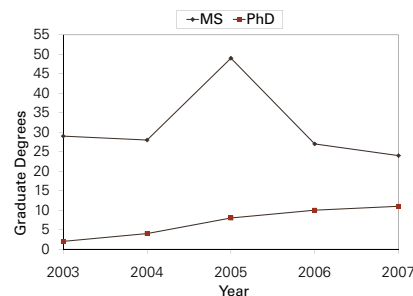
The CCEE department awarded 161 BS degrees, 24 MS degrees, and 11 PhD degrees last year.

BS Degrees Awarded



Eighty-six civil engineering and 75 construction engineering BS degrees were awarded. This is an increase of nearly 4 percent total BS degrees awarded.

Graduate Degrees Awarded



The number of PhD degrees awarded continued on an upward trend.

Transportation Students Learn From Professionals

The Transportation Student Association (TSA) joined the CCEE department's other student organizations to kick the year off at the department's first annual Club Fest in August. Members of TSA also were involved in a high school career fair in September and were able to show the youth of Iowa the great things the world of transportation engineering has to offer. In addition, the organization held biweekly meetings with presentations from an Iowa State professor in the logistics department as well as some of the top companies in the transportation engineering field, including: **Kimley-Horn & Associates**, **Snyder**

& Associates, **CH2M Hill**, **Kittelson & Associates**, and the **City of West Des Moines**.

In the spring 2008 semester, 14 members of the group attended the Transportation Research Board annual meeting in Washington D.C., an event that attracts professionals in transportation engineering from all over the world. Many presentations on recent research studies were made throughout the conference. The students got to learn about the real world in transportation and interact with professionals in the field. ■

—Cari Kinzenbaw, TSA president

Jaselskis to Lead Engineering Policy and Leadership Institute

In September, Iowa State University's College of Engineering received a \$500,000 gift from James Balloun (BS IMSE '60) and his wife Julie to establish the Engineering Policy and Leadership Institute (EPLI). Shortly after, **Ed Jaselskis**, professor-in-charge of the construction engineering division, was named the first EPLI director. The EPLI will focus on increasing the engagement of engineering in state and national policymaking as well as the number of engineers in elected positions. Jaselskis will oversee the institute, which consists of three main components: the Engineering Leadership Program, the Engineering Faculty Fellowship Program, and the EPLI Thematic Year.



Ed Jaselskis

"I'm very excited about leading this new institute at Iowa State," says Jaselskis. "Our society is just coming to grips with many challenging issues that will affect us today as well as generations in the future: global warming, water shortages, depletion of fossil fuel energy, and decaying infrastructure. Technology will play a vital role in solving many of these issues, and we will need more engineers in leadership positions in companies and government who can understand the 'technical' issues and can pass laws that use the best technologies to help our nation prosper."

Jaselskis adds that a distinctive aspect of this program is its emphasis on developing public policy leadership skills at the undergraduate level.

"Iowa State will not only produce technically strong students with a grasp of key issues facing our society, but also individuals with the right skill set to provide leadership in industry and government to shape public policy in addressing these key issues." ■

DBIA Gets Involved

The Iowa State student chapter of the Design-Build Institute of America (DBIA) began its year in August with the first ever CCEE department Club-Fest. The event, which coincided with the dedication ceremony for the newly renovated Kiewit Student Study Center and Highway Design Classroom, and the CCEE department's welcome back barbecue, allowed CCEE student organizations to reach out to incoming students and welcome back current students.

During the fall semester, the group hosted and participated in several other special events, including the first annual DBIA football tailgate, and a presentation by Walker Lee Evey, president of the national DBIA, on the rapid reconstruction of the Pentagon after the September 11 terrorist attacks. In early October, the group traveled to Minneapolis for a day trip filled with jobsite visits and an office visit to Ryan

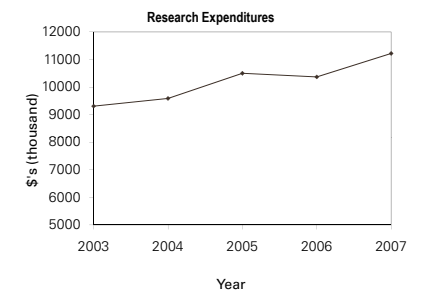
Companies. The group also traveled to Dallas, Texas, to attend the Design-Build Expo 2007, the national convention for DBIA student chapters. Last year, the Iowa State chapter took pride in sending more students to the convention than any other school.

Additionally, DBIA continues to host monthly meetings where professional design-builders travel from across the country to speak to Iowa State's DBIA members. The student chapter also is involved heavily with the DBIA's professional chapter in Iowa. The students attend the bimonthly breakfast meetings, as well as work with the chapter's steering committee in sharing special events and presentations. Other social activities and volunteer work also are planned for the student chapter. Visit www.stuorg.iastate.edu/dbia for more information. ■

Research Trends

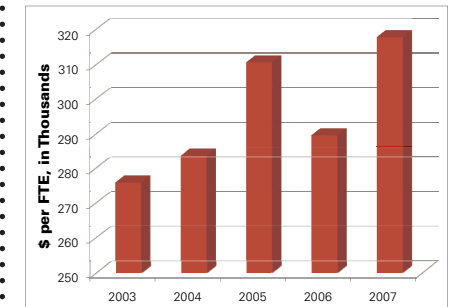
The department's research expenditures took an 8 percent jump last year. The following graphs offer more details on trends with regards to research and proposal productivity.

Research Expenditures



Research expenditures increased by 8 percent in the past year.

Research Dollars per Full-Time Faculty



The CCEE department's research expenditures per full-time faculty equivalent has reached an all-time high.

ConE students Finish in Top 5 at MCA Contest

Iowa State's student chapter of the Mechanical Contractors Association (MCA) of America had their best showing ever in this year's MCA student competition. The Iowa State team placed fifth out of 20 teams in the regional competition, missing out on fourth place and the chance to compete at the national convention by a mere two-tenths of a point.

At the competition, students submit a design and construction proposal for a designated project and three industry professionals review the proposals, which include resumes, design and construction schedules, design calculations,



The MCA student team placed fifth at this year's regional competition.

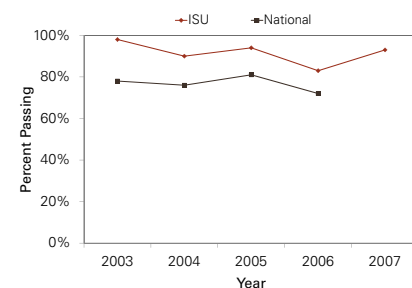
drawings, and a cost estimate.

Members of Iowa State's MCA team included construction engineering seniors **Nicole Bell**, **Bryan Schmidt**, and **Brian Steffens**; construction engineering junior **Dave Kubik**; and mechanical engineering senior **Dan Short**. **Brad Perkins**, lecturer in construction engineering, is

Student Success Trends

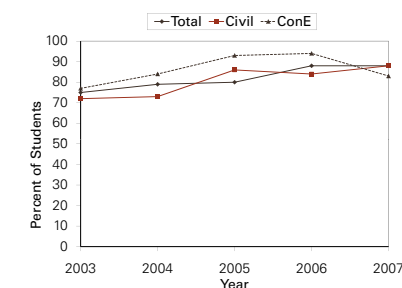
Our department has a reputation for sending students into industry with strong fundamentals and engineering backgrounds. The data below show two particular areas in which students succeed, as well as resources the CCEE department offers to them to support their success.

FE Exam Passing Rates



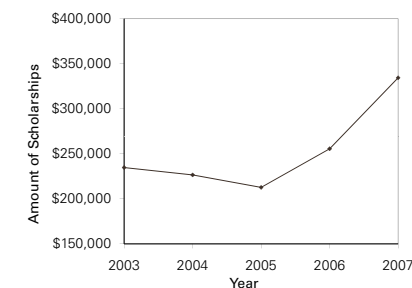
Our students consistently achieve a higher passing rate on the Fundamentals of Engineering Exam than the national average.

BS Graduates Job Placement



Placement at graduation remains high—83 percent for construction engineering and 88 percent for civil engineering students.

Scholarships Awarded



The number of scholarships has increased and amount per scholarship awarded has reached an all-time high.

SLC Inducts New Members

Iowa State's chapter of Sigma Lambda Chi (SLC), a national construction engineering honor society, inducted five new members during the fall semester. Students who join the society must have completed at least two years in a construction-based curriculum and be in the top 20 percent of all students in the program. A second initiation will be held in the spring.

The group holds several monthly meetings throughout the school year, as well as Hotel Lego presentations. Hotel Lego is presented by SLC members to prospective high school, middle school, and elementary school students

to introduce them to what construction engineering is at Iowa State and then allow them to act as construction engineers on a small scale. Each student is provided a blueprint to use to construct a miniature hotel.

Additionally, SLC helped with transfer student class registration as well as assisted peer mentors evaluate learning community presentations. The group also holds several social activities throughout the year. Its faculty adviser is Assistant Professor **Jennifer Shane** and the student president is **Andrew Petersen**. ■

ASCE Continues Busy Year

The Iowa State ASCE student chapter has made strides this year. The group has about 200 members, and practicing professionals from companies such as Caterpillar, Ayers Associates, American Public Works Association, and SRF came to talk to the group, allowing opportunities for students to network and learn about companies in a relaxed environment.

Additionally, ASCE hosted many social events ranging from tailgates before home football games to a ping-pong tournament for CCEE students, faculty, and staff. The group's undergraduate advisory night was a success in the fall semester. The advisory night allowed younger students to learn more about what classes they should take and when they should register for them.

ASCE's been busy with outreach activities, too. Members helped at the Society of Women in Engineering's Haunted Village where children learn about different types of engineering. They also did West Point Bridge with

the Road Less Traveled series, teaching middle school girls about careers in science, engineering, and technology fields.

The Steel Bridge and Concrete Canoe teams have started to prepare for their competitions, which take place during the spring semester. Steel Bridge also sells pizza every Wednesday to raise funds for future projects. The regional competition for Steel Bridge will be held in Iowa City, Iowa, and Concrete Canoe will be in Platteville, Wisconsin. At last year's regional competitions, the Steel Bridge team placed fifth overall, receiving first place for aesthetics, and the Concrete Canoe team received second place overall. ■

—Nicole Oneyear,
ASCE PR/Recruitment

2007-08 Student Achievements

The CCEE department congratulates the following students on their accomplishments in the past year:



Khalil Ahmad

Khalil Ahmad, graduate student in environmental engineering, received the second place award for best poster at Purdue University's Remote Sensing Conference Student Poster Competition for his poster about crop biosecurity in the United States. The conference was sponsored by the Great Midwestern Regional Space Grant Consortia and participants came from several diverse disciplines.

Nicole Bell, senior in construction engineering, won the university's Exemplary Returning Peer Mentor Award at the 6th Annual Peer Mentor Recognition Celebration last April. Bell was a Construction Engineering Cornerstone Learning Community peer

mentor for three consecutive semesters.

Deanna Davis, graduate student, won the James Hoover Memorial Scholarship for academic excellence for graduate students in civil engineering with a geotechnical emphasis.

Graduate students **Justin Doornik**, **Jae Ho Ho**, **Samantha Hockerman**, **Sunghwan Kim**, and **Mary Rasmussen** each have won the university Research Excellence Award for outstanding research accomplishments.

Josh Hochstein, graduate student, was named the Student of the Year by the Midwest Transportation Consortium.

Luke Johanson, senior in civil engineering, was selected for the Iowa State University Alumni Association's Homecoming Cardinal Court. Members of the Cardinal Court receive a scholarship and must have a grade point average of 3.0 or higher. Award applicants are judged on their character,

outstanding achievement in academics, dedication to the university/community, and two short essay questions.

Cole Landau, graduate student, received the Construction Engineering Fellowship in recognition of academic excellence in the Construction Engineering program.

Brett Larsen and **Nicolaus McCready**, both graduate students, each received a Terracon Engineering Fellowship. The Terracon Engineering Fellowship is awarded annually to a master's degree student majoring in civil engineering with an emphasis in the geo-technical/materials/geo-environmental engineering program.

Cory McDermott, senior in construction engineering, received the Associated General Contractors of America Iowa State student chapter's 2007 Outstanding Member of the Year Award.

Nels Overgaard, who graduated in December 2006, won the W.A. Klinger Award for Outstanding Senior for 2006-07. The award recognizes senior construction engineering students who best exemplify the qualities of scholarship and service in preparing for a career as a professional constructor.

Mary Rasmussen, PhD student in environmental engineering with a co-major in biorenewable resources and technology, was recognized for earning the top score in the course evaluations of the two-week Intensive Program on Renewable Biomaterials held in Toulouse and Tarbes, France, last May. Rasmussen competed with graduate students from the United States and 15 European countries to receive this honor. ■

Second Annual Hoover Mentoring Workshop Held in November

Nearly 125 engineering students and industry practitioners gathered at the second annual Hoover Mentoring Workshop in early November. The workshop is part of the activities of the James M. Hoover Chair in Geotechnical Engineering, an endowed professorship named for former CCEE faculty member James M. Hoover. Hoover was known for his dedication to teaching, research, and mentoring.

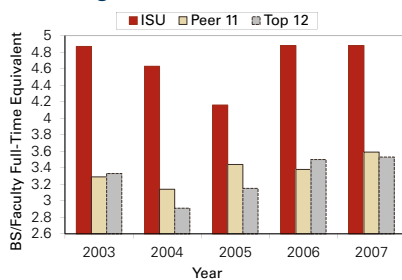
At the workshop, representatives from Burns and McDonnell, Kiewit, and the Federal Highway Administration gave a presentation and participated in a panel discussion about best practices for mentoring interns and young engineers. Additionally, the keynote speaker—Carl Monismith, professor in civil and environmental engineering from the University of California-Berkeley—spoke about road test pavement research and the development of mechanistic-empirical pavement design.

The Hoover Chair in Geotechnical Engineering and Hoover Mentoring Workshop were made possible by a gift from CCEE alumnus **Craig Denny** (BSCE '71; MSCE '73) and his wife Terry (BS Elementary Education '72). Denny is a senior principal engineer at Terracon Consultants in Lenexa, Kansas. **Vern Schaefer** is the Hoover Chair in Geotechnical Engineering. ■

Peer Institution Comparisons

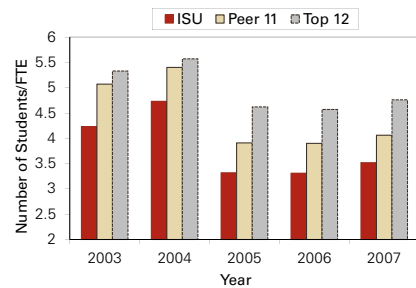
When you look at the numbers, Iowa State's CCEE department ranks right up there with our Peer 11 land grant universities, as well as with many programs named in the top 25 in *U.S. World & News Report* and other rankings. The following charts offer data showing how CCEE compares with similar departments at peer institu-

BS Degrees Awarded



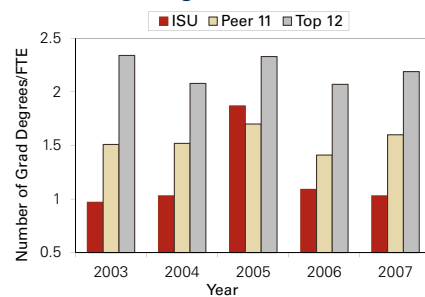
Our BS degree productivity is high compared to our peer institutions.

Graduate Enrollment



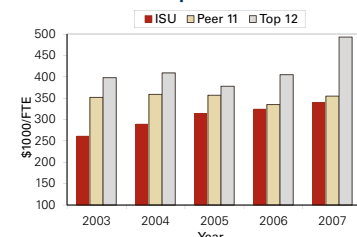
Our graduate enrollment/FTE is increasing, as it is for our peers.

Graduate Degrees



Our graduate degree production is low compared to that of our peers.

Research Expenditures



While our research expenditures per faculty FTE are on the rise, they still fall below that of our peer institutions.

Alumni Awards and Achievements

The CCEE department recognizes the following alumni for their outstanding achievements:

■ **W. Scott Cameron** (BS CE '70, MS CE '75) was awarded Procter & Gamble's (P&G) Professional Recognition for Individual Sustained Mastery (PRISM) Award, one of P&G's highest honors. The highly selective award honors P&G engineers who have made a real difference in P&G through their sustained and exceptional technical contributions. It is awarded to just a few individuals worldwide every two years. The award recognizes Cameron's 36 years of excellence at P&G. He is a technical expert in project management and capital systems technologies.

■ **Jeffrey Garrett** (BS Eng '73; MSCE '77; PhD CE '03) was named president and CEO of CTLGroup, a consulting firm providing engineering

and scientific services to construction and related industries.

■ **Travis Konda** (PhD CE '04) won the Eldon J. Yoder Award for Outstanding Paper for "Precast Modified Beam in Slab Bridge System: An Alternative Replacement for Low-Volume Roads" at the 2007 Transportation Research Board Low Volume Road Conference. The paper was based on research sponsored by the Iowa Department of Transportation and conducted by the Bridge Engineering Center at Iowa State. It was coauthored by Professors **Terry Wipf** and **F. Wayne Klaiber**, as well as Howard County Engineer **Tom Schoellen** (AA ConE '64).

■ **Larry Mattusch** (BS CE '66) received the NACE Service Award from the Iowa County Engineers Association.

He is a retired county engineer for Scott County, Iowa.

■ **Thomas Murray** (BS CE '62) received the Professional Achievement Citation in Engineering Award (PACE) from the ISU Alumni Association. The award recognizes superior technical or professional accomplishments in the areas of research, development, administration, education and other engineering activity. The citation was established to recognize alumnae/alumni eminently known for their competence and creativity. Murray is a professor of civil and environmental engineering at Virginia Tech.

■ **Mark Nahra** (BS CE 1984) was awarded the Special Service Award from the Iowa County Engineers Association. He is a county engineer for Delaware County, Iowa. ■

Faculty & Staff Honors

The CCEE department acknowledges the following faculty for their achievements in the past year:

■ **Larry Cormicle**, senior lecturer, was chosen as this year's Associated General Contractors of America Outstanding Educator. Cormicle also received the 2007 Joseph C. and Elizabeth A. Anderlik Teaching Award. The award, given by the CCEE department, honors a faculty member each year for his or her contributions to undergraduate teaching. The award includes a cash prize. Additionally, the Associated General Contractors of America ISU Student Chapter named Cormicle the CCEE department's Outstanding Faculty of the Year. (See page 14 for more details.)

■ **Chuck Jahren**, associate professor, previously the professor-in-charge of construction engineering, is now serving as the Warren Scholar of Distance Education in Civil Engineering. Jahren will oversee and manage civil, construction, and environmental engineering distance education course offerings, market the new CCEE online graduate programs, and chair the CCEE Distance Education Committee. This is a three-year appointment.

■ **Ed Jaselskis**, professor, has been appointed professor-in-charge of the construction engineering program and to the W.A. Klinger Professorship. The professorship, held by the professor-in-charge of the construction engineering division, provides support for course development, graduate assistants, laboratory equipment, scholarly travel, and research projects.

■ **LaDon Jones** was promoted from lecturer to senior lecturer in civil, construction, and environmental engineering.

■ **Amr Kandil**, assistant professor, received the American Society of

Civil Engineers' Thomas Fitch Rowland Prize. The society has given the award annually to qualified individuals since 1882. It recognizes accomplishments and contributions in the areas of construction management and engineering.

■ **Jon (Matt) Rouse**, previously a lecturer in the CCEE department, has been hired as assistant professor of structural engineering.

■ **Shashi Nambisan**, professor and director of the Center for Transportation Research and Education (see more about him on page 15), received numerous awards before leaving his position at the University of Nevada to start at Iowa State in February. Nambisan was named Engineer of the Year by Nevada's chapter of the Institute of Transportation Engineers and he received the Leadership in Community Involvement Award from the Southern Nevada branch of the American Society of Civil Engineers. Nevada Governor Jim Gibbons also issued a proclamation declaring January 31, 2007, Professor Shashi Nambisan Day in Nevada to "thank and commend him for his devotion, honorable service, and dedication" to serving the citizens of Nevada.

■ **Brad Perkins, Todd Sirotiak, and Larry Cormicle** each received the Memorable Teacher Award from the Center for Excellence in Learning and Teaching. The three were nominated by their students.

■ **Chris Rehmann**, assistant professor, was awarded the Charles W. Schafer Award for Excellence in Teaching, Research, and Service. The award includes a cash prize.

■ **Tom Stout**, lecturer, was named a fellow of the Institute for Transportation Engineers.

■ **Kelly Strong**, associate professor, won the 2007 Design-Build

Institute of America's (DBIA) Educator of the Year Award. He serves as faculty adviser of the Iowa State DBIA student chapter. (See page 14 for more details.)

■ **David White** was promoted from assistant professor to associate professor with tenure. He also received the 2007 American Society of Civil Engineers' Arthur Casagrande Award. This national award was established by family, friends, and colleagues of Arthur Casagrande, a pioneer in soil mechanics, to recognize outstanding achievements in teaching, research, and the practice of geotechnical engineering. It provides professional development opportunities for outstanding practitioners, researchers, and teachers of geotechnical engineering under age 35.

■ **Hans van Leeuwen**, professor of environmental engineering; Shinnosuke Onuki, graduate student in agricultural and biosystems engineering; and Jacek Koziel, assistant professor of agricultural and biosystems engineering, have been awarded the Grand Prize for University Research by the American Academy of Environmental Engineers. The honor rewards the researchers for their work in developing a more effective way to purify alcohol, and even turn fuel ethanol into beverage alcohol. ■

Construction Engineering Faculty Win National Awards, Improve Cost-Estimating

Throughout the past year, faculty from the CCEE department's construction engineering (ConE) division have received national and regional attention for their teaching and research efforts. The following are some of the highlights from the past year.

Cormicle, Strong Win National Teaching Awards

Larry Cormicle, senior lecturer in construction engineering, and **Kelly Strong**, both won national awards for their dedication to teaching and leading students. Cormicle received the Associated General Contractors of America's (AGC) Outstanding Educator Award. He came to Iowa State University in 2002, and since then has served as the faculty adviser for the AGC student chapter. The student group has gained national recognition for their active participation in construction outreach and community services projects, among other activities. The chapter has been named the AGC Chapter of the Year for three consecutive years—2005, 2006,

and 2007—under Cormicle's direction. The student group also has participated in the AGC/Associated Schools of Construction Region IV Competition. Three out of the four group's teams that competed in fall 2007 received first place honors. Those top teams will compete in national competitions this spring.

Strong was awarded the Distinguished Design-Build Leadership Award from the Design-Build Institute of America (DBIA) in 2007. He advises the Iowa State DBIA student chapter, a group that under Strong's leadership has remained active within the CCEE department. The group started the department's ClubFest, an annual fair for students to learn about student organizations in civil, construction, and environmental engineering. The group also traveled to job sites, organized social events, attended the DBIA national convention, and hosted industry professionals who presented seminars on campus. Strong also has worked, along with **Rhonda Wiley-Jones**, ConE academic adviser, throughout the past few years to coordinate the Construc-

tion Engineering Cornerstone Learning Community. A learning community is a way for students to interact with other students who have similar academic interests so they can learn together and enhance their experience at Iowa State.

In addition to teaching, advising the DBIA student group, and coordinating the learning community, Strong is involved in cutting-edge research on innovative bridge designs for rapid renewal. See page 20 for more information on this project.

Shane Improves Cost-Estimating

Jennifer Shane, assistant professor of construction engineering, is using her knowledge and expertise gained from her PhD work at the University of Colorado to work with state Departments of Transportation (DOT) to improve their methods and practices for cost-estimating.

Shane's PhD work involved participating on a team that developed a guidebook for cost-estimating and cost-management as part of a National Cooperative Highway Research Program study. Shane and her colleagues identified 18 global reasons why construction projects fail to accurately predict the cost of completing a project and developed eight strategies for addressing those issues and achieving accurate cost estimates. They also interviewed representatives from more than half the DOTs in the United States to create 30 methods and 90 tools for implementing the strategies.

The researchers took the best practices from the DOTs to create recommended methods and tools. Two states, Minnesota and Georgia, are now

working to implement these guidelines for cost-estimating and management. And that's where Shane's research at Iowa State begins.

Starting in 2006 when Shane came to Iowa State, the Minnesota DOT asked her and other research partners at the University of Colorado, Texas A&M University, Arizona State University, Parsons Brinckerhoff, and SRF Consulting, to help them with a multi-phase project to overhaul their cost-estimating and management process. The first phase involved assessing the Minnesota DOT's current processes.

"Each estimator in Minnesota had his or her own way of estimating—even estimators in the same office did things differently," Shane says. "There also was no established manual of practice."

In the research project's second phase, Shane helped the Minnesota DOT develop a process model outlining procedures for conducting cost-estimating and policies to support the implementation of the model.

In the project's third phase, which Shane is currently working on, she's developing a technical reference manual that the Minnesota DOT can use to implement the model. The final stage, which will occur later this summer, involves training estimators, project managers, and outside consultants who work with the DOT about the new process.

New Honors for ConE Lecturers Established

In 2007, two honors for ConE lecturers were formed: The Glenn H. DeStigter Award in Construction Engineering and the Glenn H. DeStigter Scholar in



Jennifer Shane (top middle) meets with collaborators to discuss cost-estimating and cost-estimating management.

Construction Engineering. The scholar recognition and award provide additional funding to a ConE lecturer for a five-year period. This year, Senior Lecturer **Larry Cormicle** received both the award and scholar recognition to honor his contributions to the ConE undergraduate program and related responsibilities for oversight of the ConE undergraduate course management efforts and coordination of all ConE student scholarships.

Construction Engineering Gains National Exposure for New Graduate Courses

New courses in the construction engineering division have been featured in several national publications, including *Engineering News Record* and *Professional Surveyor Magazine*. The magazines are largely featuring two new, first-of-their-kind graduate courses created by ConE faculty.

The courses, *CE 594E: Project Controls* and *CE 594F: Computer Applications for Project Controls*, cover 3D GPS automated grade control systems and were first introduced two years ago. This spring, the ConE division will offer these courses as part of its new online master's degree program in

construction engineering and management. The online courses will be presented in four-week sessions via state-of-the-art video streaming on a secure Web site so students can view the classes in "real time" or on demand. During the courses, students will hear from contractors, consulting engineers, designers, surveyors, and equipment dealers from leading companies such as McAninch, CAT/Ziegler, Snyder & Associates, and others about how each of those individuals and businesses use the equipment. Students also will get an overview of GPS systems, stakeless grading, intelligent construction, and GPS theory, as well as address the challenge of converting CADD drawings to machine control files. For more information on distance education courses, visit www.ede.iastate.edu. ■



Kelly Strong (left) receives the Distinguished Design-Build Leadership Award from DBIA's President, Walker Lee Evey.



Larry Cormicle (left) receives his Outstanding Educator of the Year Award from AGC.

Environmental Engineering Faculty Earn NSF Grant, Improve Soy Processing

Throughout the past year, environmental engineering faculty in the CCEE department have made great strides in their research. They've earned new National Science Foundation (NSF) grants for research that could potentially help improve climate modeling used to study global warming, as well as developed a method to improve soy processing. The following highlights two of those research projects underway in CCEE.

Rehmann Earns NSF Grant to Boundary Mixing in Lakes

CCEE researchers **Chris Rehmann**, assistant professor of environmental engineering, **Danielle Wain**, PhD student in environmental engineering, and three undergraduate research assistants are spending their summers on Iowa's lakes studying the lakes' internal movements. They want to better understand how nutrients and pollutants are transported from the lakes' boundaries to their interior.

The researchers received a new, highly competitive \$482,115 National Science Foundation (NSF) grant to conduct tests on Ada Hayden Lake in Ames, Iowa, in the summer of 2007, and will study West Okoboji Lake in Dickinson County, Iowa, in the summer of 2008.

"Although much recent work has focused on boundary mixing processes, less of it has studied the ultimate fate of the mixed fluid," says Rehmann. "We're trying to answer the question: How do fluid mixed boundaries move into the interior?"

In lakes and other bodies of water, waves occur not only on the surface, but also under the surface. Those waves break along the sides of the lake, causing turbulence in the water and mixing of sediments and other nutrients or pollutants as well as the transport of heat. This process is called boundary mixing. When the waves break on the shoreline or side of the lake, the materials they transport are dispersed back into the

lake in intrusions.

Tracking these intrusions, as well as measuring the water temperature, wind speed, lake depth, velocity of particles in the water, and solar radiation, helps researchers understand what happens to the mixed materials when they're dispersed into the lake.

Rehmann and Wain's research is only a small piece of the puzzle for oceanographers and environmental engineers. If researchers can determine where the intrusions go in the interior of lakes, they'll be able to determine where contaminants will end up if the water is polluted, as well as apply this research to oceans and other bodies of water.

"This is the first time researchers have put together the pieces," says Wain. "Other researchers have done studies in other contexts, and we're trying to connect the dots other researchers haven't been able to connect yet."

Understanding how fluid from the boundaries moves into a body of wa-



Chris Rehmann prepares to conduct a dye test in Ames, Iowa's Ada Hayden Lake.



Researchers placed the above testing device in Ada Hayden Lake. It measures water temperature, wind speed, lake depth, and more.



Chris Rehmann (left) and graduate student Danielle Wain (right) are the lead researchers on an NSF project to boundary mixing in lakes.

ter's interior, and thus how the heat is balanced, also can help researchers by improving climate modeling techniques used to study global warming.

Closer to home, Iowa middle school and high school students will benefit from the knowledge gained in this study. Rehmann and his research team plan to provide outreach activities for young students to teach them about water quality issues. The researchers also will hold a class at the Iowa Lakeside Laboratory, an organization run cooperatively by Iowa State University, the University of Iowa, the University of Northern Iowa, and the Board of Regents, State of Iowa.

Researchers Improve Soy Processing by Boosting Protein and Sugar Yields

Graduate student Bishnu Karki turned on an ultrasonic machine in an Iowa State University laboratory. With a loud screech, the machine's high-frequency sound waves churned a mixture of soy flakes and cold water. And that churning could be a major boost to soy processors and the food industry.

Adding ultrasonic pretreatment to soy processing boosts and improves the yield of protein that can be added to foods, says **Samir Khanal**, environmental engineering clinician. In Iowa State laboratory tests, exposing ground and defatted soy flakes to ultrasonics has increased the release of soy proteins by 46 percent.

Khanal says the ultrasonic treatment also breaks some of the bonds that tie sugars to the soy proteins. Separating the sugars from the proteins improves the quality of the proteins. It also boosts the sugar content of the soy whey that's left after processing. Ultrasonic treatment boosted sugar yields by 50 percent.



Samir Khanal and collaborating researchers improved soy processing by boosting protein and sugar yields. The researchers applied ultrasonic pretreatment technology to soy processing to improve the yields.

The low-cost, sugar-enriched whey can replace an expensive compound used to grow lactic acid bacteria, Khanal says. The bacteria produce nisin, a valuable natural food preservative that's also used in cosmetic and health care products such as mouthwash and toothpaste.

"Our preliminary economic analysis showed that the proposed technology could generate revenue up to \$230 million per year from a typical plant producing 400 million pounds of soy protein isolate," says a summary of the research project. "This is a major breakthrough in the soy processing industry."

Khanal leads a research team that includes **Hans van Leeuwen**, professor of environmental engineering; **David Grewell**, assistant professor of agricultural and biosystems engineering and courtesy assistant professor in environmental engineering; Stephanie Jung, assistant professor of food science and human nutrition; and Buddhi Lamsal, a senior scientist at Kansas State University in Manhattan. Larry Johnson, the director of Iowa State's Center for Crops Utilization Research, and **Tony Pometto**, professor of food science and human nutrition and

courtesy professor in environmental engineering, are assisting with the project. Iowa State graduate students Bishnu Karki, who's studying environmental science, and Debjani Mitra, who's studying biorenewable resources and technology, are also working on the research project.

The research is supported by a grant of \$81,977 from the Grow Iowa Values Fund, a state economic development program. Cargill and other major food processors are supporting the research project with materials and supplies. And the Iowa Biotechnology Byproducts Consortium is supporting the nisin portion of the project with a grant of \$155,711.

Khanal says the technology has boosted protein and sugar release in batch-by-batch lab tests. The researchers will now try lab tests to see how it works in the same kind of continuously flowing stream that would be used in a soy processing plant.

The researchers are optimistic the technology can be effective and efficient in a full-size soy processing plant. van Leeuwen says the ultrasonic treatments only require a few seconds and can be done in a pipeline connecting a plant's soy processing units. He

Geotechnical Faculty Seek to Build Better Roads, Study Catastrophic Landslides

Faculty in the CCEE department's geotechnical division are involved in numerous international research projects and in renovating the division's research facilities on Iowa State's campus. The following are highlights from those faculty members' work in the past year:

White Builds, Tests Unsurfaced Airfield

In June 2007, **David White**, associate professor and Waldo W. Wegner Professor in Civil Engineering, trekked to Timber Creek, Australia, in the country's Northern Territory to participate in a joint exercise between United States and Australian defense forces to construct an unsurfaced airfield. The trip took White to the Bradshaw Field Training Area in Australia, and was the culmination of the Joint Rapid Airfield Construction Program.

"The exercise showcased several technologies such as digital designs in-

tegrated with Global Position Systems (GPS) machine control, roller-integrated compaction monitoring, and rapid soil stabilization," says White. "The exercise was completed in 22 total days of construction, demonstrating a spectrum of technologies designed to speed contingency engineering operations."

During the exercise, White worked with the joint military construction teams and performed in-situ testing to evaluate the performance of intelligent compaction machines and rapid soil stabilization using cement and fibers.

This trip was supported with funding from Caterpillar. White is currently analyzing the results for future use.

Schaefer Studies Catastrophic Landslide

In May 2007, **Vern Schaefer**, professor and the Hoover Chair in Geotechnical Engineering, and his University of Florida colleague Luis Campos,

travelled to the Philippine town of St. Bernard as part of a National Science Foundation-funded reconnaissance team investigating the area's February 17, 2006, landslide. The landslide occurred suddenly following several weeks of heavy rain and a relatively mild earthquake. It killed more than 2,000 people.

"The earthquake hitting the saturated rock materials was sufficient to cause a massive rockslide that moved 15 million cubic yards of material," says Schaefer. "The top of the rock scarp is 2,500 feet above the valley floor. The rock and soil debris field moved 1.6 miles out from the slope."

During this visit, Schaefer and Campos conducted terrestrial-based laser scanning of the landslide in order to develop detailed topographic maps of the site. They worked with officials from a division of the Philippine Department of Environment and Natural Resources and the dean of the Mapúa Institute of



Vern Schaefer stands on the landslide site he investigated in the Philippines



Researchers in the Philippines use terrestrial laser scanning equipment to gather data about the catastrophic landslide that occurred in St. Bernard in 2006.

Technology's School of Earth and Materials Science Engineering in Manila to conduct their investigation.

Schaefer previously traveled to the site in June 2006 to meet with government officials and begin investigating the landslide's cause. And since Schaefer returned home in May, he's been writing a report assessing the current stability of the landslide site. When completed, he will submit the report to the National Science Foundation and government agencies in the Philippines.

Williams Completes Asphalt Lab Renovation

Since 2005 when Associate Professor **Chris Williams** came to Iowa State, he's been working to renovate the Advanced Asphalt Materials Laboratory and make it a state-of-the-art research facility.

"We need to offer an education and research program consistent with industry, as well as be forward thinking to what the lab of the future will be," he says. "The renovated lab will be a great resource for the state of Iowa and for our partnerships with industry, state

DOTs, counties and cities."

The renovation of the Advanced Asphalt Materials Laboratory, located in room 168 of Town Engineering Building, was recently completed. After painting the room in cardinal and gold, workbenches, an epoxy resin countertop, eyewash station, a drop ceiling, and new lighting were installed in the room. A servopneumatic test system, compactor, ovens, shear mill, balances, and heating mantles also were added. More equipment will continue to be added to keep the lab up-to-date and on the cutting edge.

Williams says the renovated lab is one of the finest in the Midwest for asphalt research, provides state-of-the-art testing capabilities, and allows for testing to be conducted more efficiently.

He also says the department will seek accreditation for the lab from the National Institute of Standards and Technology. If accreditation is achieved, it would make the lab one of only 20 asphalt labs accredited nationally—allowing asphalt researchers in the department to be competitive nationally for research funding and for

attracting top-quality graduate students.

Additionally, the lab updates will provide students with more hands-on learning opportunities so they can gain a better understanding of materials to successfully enter the workforce. ■



Researchers used GPS machine control, roller-integrated compaction monitoring, and rapid soil stabilization technologies to create an unsurfaced runway.



A military soldier uses a GPS device to help mark the runway.



David White stands next to the completed unsurfaced airway in Australia.



Chris Williams has worked to renovate the CCEE department's Advanced Asphalt Materials Laboratory. He's brought in new state-of-the-art equipment to make it one of the top asphalt labs in the Midwest.

Structures Researchers Study Seismic Issues and Rapid Bridge Renewal

Throughout the past year, researchers in the CCEE department's structures division have secured new research funding and conducted projects to study seismic issues and rapid bridge renewal. The following are just a few of those projects:

Behavior of Non-rectangular Concrete Walls Under Multidirectional Loads

Sri Sritharan, associate professor of structural engineering, participated in a collaborative research project with the University of Minnesota (UMN), University of Puerto Rico at Mayagüez, and the Nakaki Bashaw Group, a structural engineering firm based in California. The research focuses on analytical, experimental, and educational efforts to investigate the behavior of non-rectangular walls subjected to multidirectional loading. Most of the experimental tests involving T-shaped and rectangular walls were completed using the Network for Earthquake Engineering

Simulation (NEES) Multi-Axial Subassembly Testing system at UMN. All of the researchers participated locally or remotely during testing. Researchers at Iowa State also have remotely controlled portions of the testing.

The Iowa State researchers are studying the analytical simulation of walls under multidirectional loading. The Iowa State team has developed and released two material models for the OpenSees software package, a software framework for developing applications to simulate the performance of structural and geotechnical systems subjected to earthquakes. The two new material models are now used by other earthquake engineering researchers worldwide. With these improved elements, the researchers have shown that the complex behavior of non-rectangular walls satisfactorily can be captured using analytical models.

The research was supported by the National Science Foundation's (NSF) PreNEESR program, as well as with

supplementary funding from the NSF's International Research and Education in Engineering (IREE) program. The IREE funding allowed Iowa State researchers to partner with the National Center for Research on Earthquake Engineering (NCREE) in Taiwan to integrate international collaboration into the project's research, education, and outreach activities. Iowa State and NCREE are now building a new precast concrete wall system that will be subjected to stimulated seismic testing in March 2008.

Innovative Bridge Designs for Rapid Renewal

In 2007, **Terry Wipf**, professor of structural engineering; **F. Wayne Klaiber**, distinguished professor emeritus of structural engineering, and **Kelly Strong**, associate professor of construction engineering, received funding from the Transportation Research Board's Strategic High-

way Research Program to conduct a research project aiming to develop standardized approaches for designing, constructing, and reusing complete bridge systems that address rapid renewal needs and efficiently integrate modern construction equipment. The Iowa State researchers are collaborating with HNTB Corporation, a nationwide transportation engineering and planning firm; Structural Engineering Associates, a structural engineering services firm in San Antonio, Texas; Jensen Construction, a Des Moines, Iowa-based bridge and marine construction firm; Nyleve Bridge Corporation, a bridge contracting firm based in Emmaus, Pennsylvania; and the Walsh Group, a bridge contractor headquartered in Chicago, Illinois.

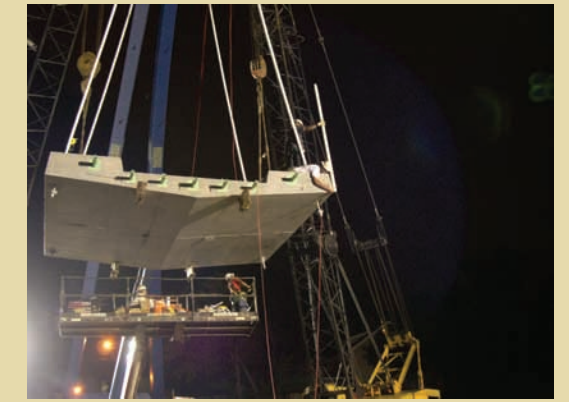
The project will focus on developing new bridge designs that take advantage of existing or even future concept construction techniques. Additionally, the research will develop new construction techniques and technologies. The new bridge concepts and construction concepts will be evaluated through analysis and laboratory testing. The researchers also will create guidelines

that contractors in the United States can use to implement new concepts, techniques, and methods into their rapid bridge construction projects.

Masonry Shear Wall Research

Max Porter, professor in structural engineering, has been conducting full-scale testing of masonry shear walls in the CCEE department's structural engineering laboratory. The concept of the research is based upon utilization of joint reinforcement placed in the bed joints to replace the conventional bond beams. Bond beams usually are placed at 4-foot intervals and are more expensive to construct than ordinary bed joint reinforcement. In the model, joint reinforcement, serving as shear reinforcement, is being tested in full-scale walls and compared to companion walls containing bond beams, which are subjected to in-plane forces as expected for shear walls in buildings. The shear walls are being subjected to reversed sequentially phased displacement loading to simulate earthquake-induced in-plane forces on walls of masonry buildings. Porter hopes the project will show that it's more cost

efficient to use joint reinforcement in lieu of conventional bond beams to construct masonry walls. The project is sponsored by support from major suppliers of joint reinforcement, including Dayton-Superior (Dur-O-Wal), Hohmann and Barnard, and Wire-Bond. ■



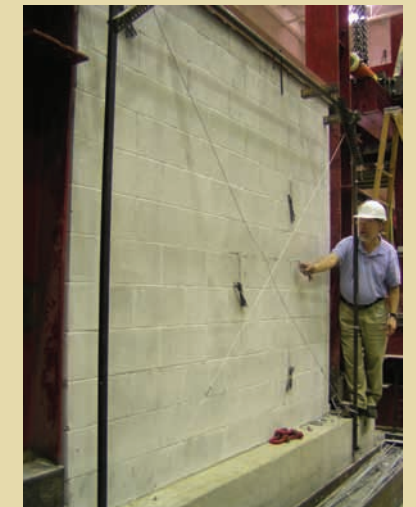
The above pictures show precast elements being placed on a bridge on I-235 in Des Moines, Iowa. The elements are used in accelerated bridge construction and are part of what's being studied by CCEE structural and construction engineers researching rapid bridge renewal.



From New Zealand, Sri Sritharan (right) and a colleague participate remotely and in real time at a test conducted at the University of Minnesota.



Sritharan is studying the analytical simulation of walls under multidirectional loading.



Masonry shear wall utilizing joint reinforcement in an investigation to determine benefits of this type of shear reinforcing. Greg Baenziger, PhD CCEE student, is looking at wires to the embedded strain gages.

Transportation Faculty Revitalize Surveying Program and Improve Traffic Safety Abroad

Faculty in the CCEE department's transportation division work closely with ISU's Center for Transportation Research and Education (CTRE), one of the nation's premier transportation research institutes. Transportation faculty members have also been involved with refurbishing teaching facilities and introducing new equipment in the Town Engineering building. The following activities highlight some of the transportation faculty's efforts this past year.

Hallmark Appointed to NSF Faculty Fellowship, Recognized for National Studies

Shauna Hallmark was recently named a National Science Foundation (NSF) Advance Professor to represent the CCEE department. Her appointment is part of an NSF grant that ISU received to increase the participation and advancement of women in academic science and engineering careers.

Recently, Hallmark and her team have won several national and state

competitive awards for their research projects. One of these projects is evaluating the effectiveness of red-light-running cameras in reducing crashes. Due to intense public interest in the topic, the project has been featured in over 20 news articles to date. Hallmark's work has been cited as one of the few statistically credible studies on the controversial topic.

Hallmark's research team is also part of a national demonstration project that will evaluate fuel economy and emissions from hybrid electric school buses. With many school districts feeling the pinch of unprecedented fuel prices, and with diesel prices in some areas approaching \$5.00 per gallon, this study is receiving national attention.

On yet another project, Hallmark is teaming with the Texas Transportation Institute at Texas A&M University to evaluate the effectiveness of dynamic speed feedback signs in reducing curve crashes on rural highways. This na-



Tom Stout with CCEE Highway Design Student Cale Bergstrom

tional study is sponsored by the Federal Highway Administration. Recently, she also teamed with the University of Iowa on the Strategic Highway Research Program 2 (SHRP-2) project, using naturalistic driving studies to evaluate driver behavior and roadway factors that lead to run-off-road incidents.

In each case, Hallmark and her team are working on timely topics of strategic national interest.

Stout Leads Students in New Highway Design Classroom, Teaches Capstone Design

In 2001, after some 30 years of professional practice, **Tom Stout** decided to pursue a long-held goal of earning his Ph.D. He achieved this in December of 2005; in the fall of 2006, he began lecturing in highway design. After his first year of teaching, and in response to favorable student comments, he took on the critical responsibility of teaching the second semester civil capstone course. Students have stated that they appreciate his professional experience in highway design and in consulting, as

well as the fact that he learns the names of all his students.

Stout brought his professional experience to bear on the design of the highway design lab, replicating a corporate work environment. Funding for this classroom came from HDR, Inc., Howard R. Green, Snyder & Associates, and Gerald and Audrey Olson, as well as differential tuition. "The students and I appreciate how this room has improved the highway design experience," says Stout.

Surveying Program Revitalized with New Curriculum, Equipment

After graduating from ISU, **Marlee Walton** worked in various engineering and management positions at the Iowa Department of Transportation. During this time, Walton obtained her M.S. degree in civil engineering and license as a professional engineer. In 2001, Walton started working at ISU, teaching and providing oversight to the new integrated curriculum. This new curriculum, held as a national model, incorporated professional practice skills (leadership, management, etc.) into the existing civil engineering program.

During this time, Walton consulted as a surveyor, obtaining her license as a professional land surveyor. Following a rich tradition of surveying and following in the footsteps of Kandiah Jeyapalan and Ed Kannel, she now leads the instructional efforts in the surveying courses.

In the Spring of 2008, ISU was fortunate to obtain new state-of-the-art surveying equipment. Through a significant donation from retired faculty member R. L. (Sam) Carstens (Civil Engr. '43; MS '64; PhD '66) and differential tuition funding, the CCEE Department obtained ten total stations, GPS receivers, and data collectors. As noted by civil engineering students Anthony Borgerding, Zachary Brummer, and Nathan Johnson, "The [surveying] class was a lot better learning experience due to the purchase of new surveying equipment."

Souleyrette Facilitates Collaboration with University of Pisa, Leads ISU iRAP Effort

Gerald and Audrey Olson Professor and Transportation Division Leader Reg Souleyrette was appointed

Associate Chair during the last year. In addition to his duties as Associate Director of CTRE, Souleyrette now assists CCEE Chair James Alleman with financial and personnel aspects of department administration. During the last year, Souleyrette also facilitated the signing of a memorandum of understanding between ISU and the University of Pisa. As part of the agreement, ISU and UP are exchanging short courses during the last half of 2008. Souleyrette is also leading ISU's efforts on the International Road Assessment Program (iRAP) with partners at Midwest Research Institute (MRI), the AAA foundation for Traffic Safety, World Bank, FIA Foundation, Transport Road Laboratory in London, and the Australian Road Research Board. In addition to work in several states, ISU and MRI are working with Latin American countries such as Chile, Costa Rica, Peru, and Argentina. "The goal of the project is to make data driven decisions to improve traffic safety in developing countries where over 800,000 people lose their lives each year in transportation accidents," explains Souleyrette. See www.iRAP.net and www.usRAP.us for more infor-



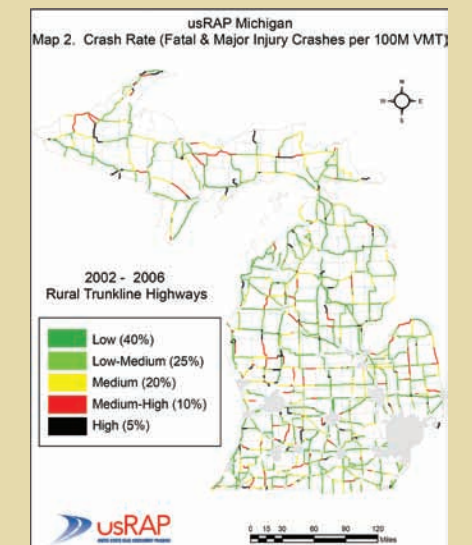
Red Light Running Data Collection (by CCEE Graduate Student Eric Fitzsimmons)



Left: The iRAP Global Team

Bottom: Heterogeneous Travel Modes of the Developing World

Right: An Example iRAP (usRAP) Risk Map



Meet our Faculty & Staff

Our faculty and staff have a strong commitment to student achievement. More than 80 percent of our faculty have industrial experience totaling over 230 years. Plus, nearly half also have international experience. Meet our educators and researchers on the following pages.

Robert E. Abendroth
Associate Professor, P.E., PhD (Wisconsin), Structures
11 years industrial experience

James E. Alleman
Professor and Chair, P.E., PhD (Notre Dame), Environmental,
8 years industrial experience
5 years international experience

Jenny Baker
Lecturer, PE, Construction
6 years industrial experience

James E. Bolluyt
Assistant Professor, P.E. Structures
2 years industrial experience

Halil Ceylan
Assistant Professor, R.E., PhD (Illinois), Civil Engineering
Geotechnical
1 year industrial experience,
1 year international experience

Larry W. Cormicle
Senior Lecturer, P.E., Construction
24 years industrial experience

Timothy G. Ellis
Associate Professor, P.E., PhD (Clemson), Environmental Systems
6 years industrial experience,
1 year international experience

Fouad S. Fanous
Professor, P.E., PhD (Iowa State), Structures
4 years industrial experience,
6 years international experience

Konstantina (Nadia) Gkritza
Assistant Professor, PhD (Purdue), Transportation

Rangan Gopalakrishnan
Clinician, PhD (Illinois), Geotechnical/
Materials

Ruochuan Gu
Associate Professor, P.E., PhD (Minnesota), Environmental
2 years industrial experience,
3 years international experience

Shauna Hallmark
Associate Professor, PhD (Georgia Tech), Transportation
2 years industrial experience

Charles T. Jahren
Warren Scholar in Distance Education,
Associate Professor, P.E., PhD (Purdue), Construction
6 years industrial experience

Edward Jaselskis
W. A. Klinger Teaching Professor,
Professor, P.E., PhD (Texas), Construction Engr & Management
4 years industrial experience,
1 year international experience

LaDon C. Jones
Senior Lecturer, PhD (UCLA), Water Resources
2 years industrial experience

Amr A. Kandil
Assistant Professor, R.E., PhD (Illinois), Construction

Edward J. Kannel
Professor, P.E., PhD (Purdue), Transportation

Thomas H. Maze
Professor, P.E., PhD (Michigan State), Transportation
2 years industrial experience

Shashi Nambisan
Director, CTRE, Professor, PhD (UC Berkeley), Transportation

Say-Keo Ong
Professor, P.E., PhD (Cornell), Environmental
7 years industrial experience,
4 years international experience

Brad Perkins
Lecturer, Construction

Max L. Porter
Professor, P.E., PhD (Iowa State), Structures
1 year industrial experience

Chris R. Rehmann
Assistant Professor, PhD (Stanford), Water Resources

Jon (Matt) Rouse
Assistant Professor, P.E., PhD (Cornell), Structures
6 years industrial experience

Vern R. Schaefer
James M. Hoover Chair in Geotechnical Engineering,
Professor, P.E., PhD (Virginia Tech), Geotechnical
3 years industrial experience

Jennifer Shane
Assistant Professor, PhD (Colorado), Construction

Todd L. Sirotiak
Senior Lecturer, P.E., Construction
20 years industrial experience

Reg Souleyrette
Gerald and Audrey Olson Professor in Civil Engineering, Professor, P.E., PhD (UC Berkeley), Transportation
1 year industrial experience

Sivalingam Sritharan
Associate Professor, PhD (UC San Diego), Structures
4 years industrial experience

Tom Stout
Lecturer, PhD (Iowa State), Transportation
24 years industrial experience

Kelly C. Strong
Associate Professor, PhD (Colorado), Construction
7 years industrial experience

Shihwu Sung
Associate Professor, P.E., PhD (Iowa State), Environmental
6 years industrial experience,
1 year international experience

Hans van Leeuwen
Professor, P.E., DEng (South Africa), Environmental
10 years industrial experience,
25 years international experience

Marlee A. Walton
Senior Lecturer, P.E., LSI, Integrated curriculum
15 years industrial experience

Endowed Professorships

Endowed professorships help Iowa State University and the CCEE department be more competitive in recruiting excellent faculty candidates and retaining its most valuable faculty. Endowed professorships and chairs are highly regarded positions that formally recognize outstanding faculty. Below is a list of the department's current endowed positions and the faculty members who hold them. For information on establishing an endowed professorship or chair, contact the ISU Foundation online at www.foundation.iastate.edu or (866) 419-6768.

James M. Hoover Chair in Geotechnical Engineering
Vernon Schaefer, professor

W. A. Klinger Teaching Professor in Civil Engineering
Ed Jaselskis, professor

Gerald and Audrey Olson Professor in Civil Engineering
Reginald Souleyrette, professor

Pitt-Des Moines, Inc. Professor in Civil Engineering
Terry Wipf, professor

Waldo W. Wegner Professor in Civil Engineering
David White, associate professor

Kejin Wang
Associate Professor, P.E., PhD (UC Berkeley), Structural Materials, Concrete
7 years industrial experience,
6 years international experience

David White
Associate Professor, PhD (Iowa State), Geotechnical/Materials
1 year industrial experience

Continued on page 28

New Faculty



Jenny Baker

Jenny Baker, lecturer in construction engineering, is a licensed professional engineer, a LEED accredited professional, and a certified lighting designer. She also has six years of industry experience as an electrical engineer/designer and lighting designer for engineering consulting firms. She holds both a bachelor's and master's degree in architectural engineering from Kansas State University.

is a member of the American Society of Civil Engineers, Institute of Transportation Engineers, Society of Women in Engineering, Women's Transportation Seminar, and the Transportation Research Board's Committee on Transportation and Economic Development. She holds a bachelor's degree in civil engineering from the National Technical University of Athens, Greece, a master's degree from Virginia Tech, and a PhD from Purdue University.



Konstantina (Nadia) Gkritza

Konstantina (Nadia) Gkritza, assistant professor of transportation engineering, has a broad background in infrastructure, traffic and transportation systems, and transportation economics and econometrics. Her research interests include transportation planning and systems evaluation, economics and policy analysis, and highway safety. She



Jon (Matt) Rouse

Jon (Matt) Rouse, previously a lecturer in the CCEE department, has been hired as assistant professor of structural engineering. He has five years of industry experience, is a licensed professional engineer, and has published several refereed journal articles and conference papers. Rouse earned his bachelor's degree from Iowa State University, and master's degree and PhD from Cornell University. ■

Jon (Matt) Rouse, previously a lecturer in the CCEE department, has been hired as assistant professor of structural engineering. He has five years of industry experience, is a licensed professional engineer, and has published several refereed journal articles and conference papers. Rouse earned his bachelor's degree from Iowa State University, and master's degree and PhD from Cornell University. ■

Continued from page 27

R. Christopher Williams

Associate Professor, PhD (Purdue), Geotechnical/Materials, Asphalt Pavements
3 years industrial experience

Terry J. Wipf

Pitt-Des Moines, Inc. Professor in Civil Engineering, Professor, P.E., PhD (Nebraska), Structures
3 years industrial experience ■

Support Staff

Academic Advisers

- Kristin Mauro
- Ted Millen
- Rhonda Wiley-Jones

Administrative Specialists

- Christine K. Knight
- Nancy Qvale

Communications Specialist

- Dana Schmidt

Secretaries

- Marva Banks
- April Franksain
- Linda Claussen
- Kathy Petersen
- Kathy Sturtevant
- Denise Wood

Account Clerk

- Judy Johnson

Lab Technician

Donald T. Davidson

Scientists

Brent Francois
Donna Lutz
David G. Schoeller

Lab Managers

James Gaunt
Douglas Wood

Extension Civil Engineer

Stephen E. Jones

PCC Lab

Heath Gieselman
Jeremy McIntyre
Bob Steffes
Bryan Zimmerman ■

Three CCEE Professors Retire



F. Wayne Klaiber, distinguished professor of structural engineering, came to the CCEE department nearly 40 years ago. During his tenure at Iowa State, Klaiber held various offices in local and national chapters of civil engineering organizations, such as the Transportation Research Board, American Concrete Institute, American Society of Civil Engineers (ASCE), and American Railway Engineering and Maintenance of Way Association. He's also won numerous teaching awards from the College of Engineering and the CCEE department, and a research prize from ASCE. Additionally, the Structural Faults and Repair Conference Committee in Edinburgh, Scotland, recently presented him with the Lifetime Achievement



Jim Cable

his career, Cable won many outstanding educator and researcher awards from several well-respected university, state, and national organizations. He is a member of ASCE and was named the ASCE Iowa chapter's Outstanding Civil Engineer. Additionally, Cable is a member of the National Society of Professional Engineers and is a licensed civil engineer in Iowa and Indiana. Cable also worked with Iowa State's

Award. He is also a fellow in the American Concrete Institute and ASCE.

Jim Cable, associate professor of transportation engineering, began teaching at Iowa State in 1984, after working as a transportation engineering and construction engineer early in his career. Throughout

CCEE Extension program to assist practicing engineers and their staffs in Iowa with licensing and certification requirements, as well as conducted research for the National Concrete Pavement Technology Center, the Federal Highway Association, Portland Cement Association, Iowa Highway Research Board, Iowa Department of Natural Resources, local governments, and the highway industry.



K. Jeyapalan

museum in the basement of Town Engineering Building, where he acquired and displayed various surveying equipment. ■

Professor **K. Jeyapalan** ("Dr. Jey") began his retirement last semester. He received numerous honors throughout his 27 years at Iowa State. He also created a surveying

Construction Engineering External Advisory Council

John Adam

Director, Statewide Operations Bureau
Iowa Department of Transportation
Ames, Iowa

Dan Biere

President
Construction Service Inc.-Omaha
Omaha, Nebraska

Ken Bonus

President, Weitz National
The Weitz Company
Des Moines, Iowa

Steve Daxon

Russell Construction
Devenport, Iowa

Beth Duyvejonck

Opus Northwest
Minnetonka, Minnesota

Paul Francois

Pepper Construction Company
Barrington, Illinois

Michael Gawley (or Ken Rech)

President
Oakview Construction Company
Omaha, Nebraska

Mark Guetzko

President
Seedorff Masonry, Inc.
Strawberry Point, Iowa

Brad Heemstra

Owner
Integrity Construction Services
Ames, Iowa

Paul Higgins

Managing Director
The Beck Group
Dallas, Texas

Larry Hopp

Vice President/Area Manager
Kiewit Construction Company
Omaha, Nebraska

Stephen Jackson

President
Cedar Valley Corporation
Waterloo, Iowa

Chris Lindhart

Director of Integrated Services
The Beck Group
Dallas, Texas

Mark McDermott

Project Manager
Black & Veatch
Overland Park, Kansas

T.J. Meiners

Electrical Engineer/Project Manager
Nelson Electric Company
Cedar Rapids, Iowa

Kent Meyn

Director of Project Management
ACI Mechanical, Inc.
Ames, Iowa

Dave Miller

Senior Vice President
The Waldinger Corporation
Des Moines, Iowa

Skip Perley

CEO
TEC-CORP
Sioux City, Iowa

Cork Peterson

Vice President
Peterson Contractors, Inc.
Reinbeck, Iowa

Gene Postma

President and CEO
Western States Fire Protection Co.
Las Vegas, Nevada

Fred Rahbar

Project management
Saudi Arabian Oil Company
Dhahran, Saudi Arabia

Dirk Schafer

Senior Vice President
J.E. Dunn Construction Company
Kansas City, Missouri

Ken Sorensen

Vice President, General Manager,
Minneapolis Office
M. A. Mortenson Company
Minneapolis, Minnesota

Emeritus and Retired Faculty

(Listed by division)

Construction

Gerald Chase
Thomas Jellinger
Ira Ward

Environmental

Robert Baumann
John "Jack" Cleasby
David Kao
Larry Northup
Paul Morgan
Charles Oulman

Geotechnical

Kenneth Bergeson
Richard Handy
Rolland Hardy
Dah-Yinn Lee
Robert Lohnes
Jack Mickle
John Pitt
John Sheeler

Structures

M. Baenziger (medical leave)
Kenneth Dunker
Lowell Greimann
F. Wayne Klaiber
Wallace Sanders

Transportation

Kenneth Brewer
James Cable
R.L. Carstens
Kandiah Jeyapalan
Clete Mercier
Richard Montag
Don Wall

CCEE Points of Pride

- Iowa State University has the 7th largest civil, construction, and environmental engineering program in the country.
- Eighty-eight percent of our graduates accept permanent jobs before graduation, and often times they select from multiple job offers. Their starting salaries on average range between \$48,800 and \$50,000.
- Our CCEE department's professors bring a global perspective to their courses. More than one-third of the faculty have international experience.
- Nearly 80 percent of our professors have professional engineering experience and are registered engineers.
- Our CCEE department's two learning communities are thriving and make the adjustment to collegiate life easier for civil and construction engineering students. ■

Civil Engineering External Advisory Council

Jim Alleman (Ex-officio)
Professor and Chair
Civil, Construction, and
Environmental Engineering
Iowa State University
Ames, Iowa

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Executive Director
CESB
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Jolee Belzung, P.E.
Director of Municipal Utilities
City of Ankeny
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Keri Hornbuckle
University of Iowa
Iowa City, Iowa

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Vice President-Marketing & Sales
Rocky Mountain Prestress
Kapolei, Hawaii

Sandra Q. Larson, P.E.
Research and Technology
Bureau Director
Iowa Department of Transportation
Ames, Iowa

Jack F. McGuire
Director, Structures Engineering &
Technology Development (retired)
Boeing Commercial Airplanes
Issaquah, Washington

Kim I. McKeown
President
HGM Associates Inc
Council Bluffs, Iowa

Tamara Nicholson, P.E.
Planning, Programming & Modal Div.
Iowa Department of Transportation
Ames, Iowa

Matt Streeter, P.E.
President
MD Streeter & Associates
State Center, Iowa

Rick Tollakson
President
Hubbell Realty
West Des Moines, Iowa

Scott Werner, P.E.
EFCO Corporation
Park Ridge, Illinois

The Year Ahead ...

As the current academic year nears closer to its completion, the CCEE department looks forward to the coming year with optimism. Students, faculty, and staff already are excelling in 2008. Look for more on the following items in next year's annual report:

Department News

- ASCE and AGC student organizations compete at national competitions
- MCA student group has best-ever showing at regional competition
- Enrollment is expected to increase for the third consecutive year

CCEE Division Highlights

- Construction engineering grad student studies emergency rebuilding
- Geotechnical engineering faculty members hope to build better roads using ethanol co-products
- Transportation engineering faculty evaluate the effectiveness of red-light cameras
- New faculty in the geotechnical, construction divisions ■



Stay up-to-date on the latest happenings and achievements of the CCEE department online at www.ccee.iastate.edu.

**Dept. of Civil, Construction,
and Environmental Engineering**

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