From humble beginnings in a cramped classroom lab, MSU civil engineering faculty members have always endeavored to be at the top of their field. Now, four years after the opening of the new Civil Infrastructure Laboratory, the quality of CEE research continues to advance and the future looks bright.

A Long Road: The history of the Civil Infrastructure Lab actually started 23 years ago when Professor Parviz Soroushian came to MSU as a faculty member in civil engineering. At that time, the department had a small, classroom-sized research facility located in the Engineering Building. The lab was not only too small; the work done there generated noise that disrupted classes and dust that clogged the building’s sewer system. It was clear to Soroushian that those current accommodations would not support the growing need for infrastructure research.

It was many years, however, before the administration understood his perspective. “For a long time I seemed to be the only voice speaking in favor of the lab,” he says. “It was a major investment and that’s why it met with resistance, but it was damaging teaching and research not to have the facility.” When Ronald Harichandran was appointed department chairperson in 1995, several faculty retirements required recruitment of researchers in structural and pavement engineering. It was apparent at that time that quality faculty could not be attracted without a functional laboratory. In 1997, Dean Theodore Bickart approved $1.1 million from college and department funds to construct a new lab.

After exploring two other sites, the decision was made in 1999 to construct the lab at its current location on Jolly Road. Harichandran, Frank Hatfield, professor emeritus, and lab manager Sia Ravanbakhsh worked with architects from Hobbs and Black and the university Physical Plant to design a facility that would meet current and future needs. In early 1999 bids on the design came in at over $2 million and the project was put on hold until additional resources could be found.

To resolve the financial problem, a concerted effort was made to raise funds from alumni and industry. Soroushian utilized his reputation as a top-notch concrete researcher and secured an initial $500,000 contribution toward the facility from the Great Lakes Cement Promotion Association. With a half-million dollars in

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After serving as department chairperson for 10 years, I have been reappointed to a third term. I am honored by the trust placed in me by the CEE faculty, staff, students, and the university administration and commit to lead the department to higher pinnacles of excellence. The last year has been one of significant achievements for our faculty. One striking success is the number of large multi-year grants and centers that our faculty helped secure. Volodymyr Tarabara, assistant professor, and Thomas Voice, professor, secured a $2.3 million, five-year Partnership in International Research and Education (PIRE) grant from the National Science Foundation (NSF) in cooperation with Rice University, two French institutions, and universities in Ukraine and Russia. Professor Susan Masten, Tarabara, and Melissa Baumann, associate professor of chemical engineering, secured a $1.3 million, three-year Nanoscale Interdisciplinary Research Team (NIRT) grant from the NSF. A new Department of Homeland Security/Environmental Protection Agency Cooperative Center of Excellence for Research on Microbial Risk Assessment was recently established. The center is led by Joan Rose, MSU fisheries and wildlife professor, and Charles Haas of Drexel University. Syed Hashsham, associate professor, is a co-PI and significant contributor on this $10 million, five-year center.

The Michigan Department of Transportation renewed the Pavement Research Center of Excellence directed by Neeraj Buch, associate professor, and the Bridges and Structures Research Center of Excellence, which I direct. Our faculty also play significant roles in three other centers: (1) The Center of Excellence for Great Lakes and Human Health funded by the National Oceanographic and Atmospheric Administration, with co-directors Professor Joan Rose and Assistant Professor Phanikumar Mantha; (2) The National Center for Pavement Preservation directed by Larry Galehouse; and (3) the outreach activity of the Midwest Hazardous Substance Research Center, co-directed by Professor Thomas Voice. This brings the total number of centers with CEE faculty involvement to six. These large grants and research centers provide a focus to the research activities in the department and the potential for sustained growth.

Leveraging the PIRE grant, our acclaimed study-abroad program in Russia will expand into Ukraine in summer 2006. Students will have the opportunity to take civil engineering, general engineering, linguistics, and education courses in Volgograd, Russia, for the first half of the summer, and environmental engineering and linguistics courses in Kiev, Ukraine for the second half of the summer. With visits to St. Petersburg, Moscow, and Prague, the study-abroad program, one of the largest at MSU, provides exciting opportunities to engineering, linguistics, education, and other majors.

Following the Accreditation Board for Engineering and Technology (ABET) evaluation last fall, the accreditation of our BS program was successfully renewed once again. We are in the process of strengthening a weakness identified relative to our program objectives and assessment, and some of you will soon receive a survey related to this. We would appreciate your participation in this survey.

I am pleased to announce the recruitment of three new faculty members to the department. Venkatesh Kodur, professor, an international expert in structural fire engineering joined the department in fall 2005. More detail on his background is provided elsewhere in this newsletter. We are in the process of expanding the Civil Infrastructure Laboratory to include a structural fire testing facility. When this is completed our department will possess a unique capability within U.S. universities for such work. Alison Cupples (PhD, Stanford University) and Irene Xagoraraki (PhD, University of Wisconsin) joined the department in January 2006 and strengthen our environmental engineering program. More detail on their backgrounds will be provided in our next newsletter.

The department is energized by the excitement of growth and renewal and I ask for your support so that we can achieve our dreams and make you proud!

~ Ronald Harichandran,
Professor and Chairperson
Department of Civil and Environmental Engineering
A luxury hotel getaway sounds so relaxing—unless you have to design and build the entire complex from the ground up. That’s what students in the CEE senior design course do. Working with practicing engineers and instructors from five technical areas, class participants are responsible for developing preliminary conceptual designs for a fictitious hotel complex at the northwest corner of Jolly and Hagadorn Roads. During the process, students must take into account such diverse considerations as environmental regulations, pedestrian and vehicular traffic, pavements, and flooding. Class members are assigned to teams of five or six and each person works on specific aspects of the complex design.

Environmental Issues: Assistant Professor Milind Khire helps students address wetland and soil issues. The groups are required to propose a strategy for removing and containing contaminated soil from the building area by designing an onsite hazardous waste landfill for the “permanent” isolation of the material. Teams do everything from delineating contamination to designing landscaping for the area to make it suitable for residential and commercial development. “The key challenge here for students is to design an on-site disposal facility that is cost-effective and meets all environmental regulations and engineering requirements. There are over 4,000 active engineered landfills and over 10,000 closed dumps in this country. Hence, seniors with the ability to design landfills are in significant demand when it comes to finding a good job,” says Khire.

Transportation Issues: To enhance the development, students evaluate traffic patterns and develop a strategy for moving Hagadorn Road out of the Herron Creek flood plain. They also plan the intersections, access roads, and parking lot for the hotel complex. Teams need to take into account complex accessibility issues as well as environmental and regulatory concerns. Thomas Maleck, associate professor and a class co-leader, guides the groups in the process, but says that the research and decision making is entirely up to the students. “They can get overwhelmed, but we don’t want to jump in and help them,” says Maleck. “We let them go down a blind alley, so it’s their design and not ours.”

Geotechnical and Pavement Issues: Professor Gilbert Baladi, oversees the students’ design of the hotel foundation, as well as the pavement cross-sections for the road and the parking lot. Teams need to address everything from road thickness and expected traffic, to regulations,
According to Baladi, students are often surprised by the minutiae in the planning. “They are all learning; we are opening their eyes,” he says. “It’s amazing to see how the students grow in the course. It’s joyful to see them get on the right track.”

**Hydrology Issues:** During the design process, teams often find that development results in an excess of water. Roger Wallace, associate professor and another class co-leader, guides students through decision-making processes having to do with water levels, surface water drainage, ground water, erosion, and flooding that result from natural features and man-made structures. As part of the course, students design drainage systems associated with the new road and the hotel site development. “Students’ primary task is to help plan for the movement of water on the ground surface following storms,” says Wallace. “They need to design systems that can accommodate both minor and major storms.”

**Structural Issues:** As part of the course, students are required to design a pedestrian bridge for foot traffic over Hagadorn Road. With the help of Assistant Professor Rigoberto Burgueño, teams are expected to propose a functional bridge that is safe, aesthetically pleasing, and cost-effective. Burgueño says that the challenge of the pedestrian bridge is to incorporate both creativity and technical knowledge. “Structural engineering is both an art and a science, and we need to promote that way of thinking in our students,” says Burgueño.

The overall feel of the course is that of a guided independent study—students have almost complete control of, and responsibility for, the end product. “They will either converge toward a solution or diverge toward failure,” says Maleck.

Wallace agreed, adding that while the course is often frustrating for students, it helps them apply their classroom knowledge in a real-world situation. “Unlike most classroom experiences, these problems are open-ended, complex, poorly structured, and allow for more than one solution,” he says. “Students need to organize teamwork, make presentations to other professionals, and transition their experience from classroom exercise to practical application.”

Students also appreciate the hands-on, real-world nature of the experience. “I think the capstone course really helped me get the feel for making decisions,” says civil engineering senior Brian Rentsch. “This course helps students build confidence in themselves—to make a decision and go with it.”

Class participants also get real-world experience working closely with a team of practicing engineers. The engineers share practical expertise accumulated from years in the field, and help students in a way the faculty cannot. “Faculty members are not practicing engineers in general,” says Wallace. “The practitioners bring in the knowledge and point of view they have from working in that environment on a daily basis.”

At the end of the semester, the team that has done the best job is awarded a plaque and cash prizes. This year, Roger Conrad (BS ’67) donated the $1,500 needed for prize money and plaques for the fall and spring winning teams. “We would like to continue to offer this incentive to the teams, and we’ve been lucky to have such dedicated volunteers to help,” says Wallace. “We hope that we can find resources to continue rewarding our hardest working students.” If you would like to make a donation to the prize fund for the civil engineering capstone course, please contact the Department of Civil and Environmental Engineering at 517-355-5107.
Steel Bridge/Concrete Canoe Teams Rally for the 2006 Competition

How do you get a broken canoe under an unfinished bridge? The answer is that you can’t. But, if you’re the MSU steel bridge and concrete canoe teams, you can take what you learned back to the drawing board and come back stronger than ever for the 2006 season.

Concrete Canoe Team: After not participating in the 2003 season, the concrete canoe team was primed for a glorious return to battle in 2004, when the canoe broke while being transported to the competition. It’s all part of the learning process according to Neeraj Buch, associate professor and team adviser. “If the canoe breaks, it hurts,” says Buch. “But next time it won’t break and we’ve learned a valuable lesson.”

The team also participated in the 2005 season, and though they didn’t place, they now have a strong and experienced group as the foundation for the 2006 competition. “We are on a positive track now,” Buch says. “This year’s team is high-spirited. They are go-getters with a higher level of involvement than I’ve seen in previous years. I think we’ll do well.”

Steel Bridge Team: The 2004 Spartan Spanners Steel Bridge Team missed glory by a matter of a few points when they took third place in the regional competition, a finish that did not qualify them for nationals. Bad came to worse in 2005 when the team failed to construct the bridge in time to make the competition.

According to Rigoberto Burgueño, assistant professor and steel bridge faculty advisor, the team has improved its project management skills and is on the road to recovery. “We have a very proactive team this year,” says Burgueño. “They’ve been working since early in the academic year to make sure everything is ready to go for competition.”

The 2006 Steel Bridge and Concrete Canoe North Central Regional Competitions will be held March 30 and April 1, 2006, at Ohio Northern University in Ada, Ohio.

Two CEE Students Receive McCowan Fellowship

Civil and environmental engineering PhD students Mohammad Sajjad and Waqar Syed Haider received the 2005 Jerry N. McCowan Endowed Fellowship to assist them in completing their dissertations. The fellowship is awarded yearly to CEE graduate or undergraduate students who achieve academic excellence in the field. Sajjad recently completed his PhD in environmental engineering, and Haider completed his PhD in pavements.
Faculty and Staff Connections

Harichandran Named MTRB Chair and ASCE Fellow

Ronald Harichandran, professor and department chairperson, was recently elected chairman of the Michigan Transportation Research Board (MTRB). The MTRB was an outgrowth of the state transportation summit in 2003 that developed action teams to work on transportation issues and problems in Michigan. Harichandran’s team will spearhead the effort to articulate the long- and short-term transportation research needs of the state. The end goal of the MTRB is to develop a better and more cost-effective infrastructure, thus saving taxpayer money.

“I’m very passionate about trying to move this research agenda forward,” says Harichandran. “We need to provide an invigorating environment for transportation research, and I’m working hard to make sure MTRB can provide such an environment.”

Harichandran was also advanced to the status of fellow by the American Society of Civil Engineers (ASCE) in October. According to the ASCE, his fellow status was awarded in recognition of significant contributions to research and service to the profession. Harichandran, who says he was honored to be chosen, joins the fewer than 4% of ASCE’s total membership who have attained fellow status.

Hashsham Plays Integral Role in Homeland Security, Is Named 2005-2006 Edwin Willits Chair

Associate Professor Syed Hashsham, will play an integral research role in MSU’s new Center for Advancing Microbial Risk Assessment (CAMRA). The center, jointly funded by the Environmental Protection Agency (EPA) and Department of Homeland Security (DHS), will focus on two primary goals. The first goal is to find ways to reduce or eliminate health impacts from the deliberate or natural release of indoor and outdoor biological agents of concern. Potential agents of concern include smallpox, anthrax, Legionella, and hemorrhagic fevers.

The second aim of CAMRA is to build a national network of information transfer about microbial risk assessment among universities, professionals, communities, and governments. To achieve these goals, the center will work on five complimentary projects in conjunction with Carnegie Mellon University, Drexel University, Northern Arizona University, University of Arizona, University of California at Berkley, and University of Michigan. The team is co-directed by Joan Rose, MSU professor of fisheries and wildlife, and Chuck Haas of Drexel University.

Michigan State University will participate in the effort to improve our ability to measure exposure to biological agents of concern in drinking water. According to Hashsham, his goal for the first year is to evaluate the sensitivity and effectiveness of existing biological hazard detection methods as well as to develop new, more efficient and accurate tools.

“The risk of biological exposure cannot be accurately quantified until you can detect the hazards with a high sensitivity,” says Hashsham. “For most organisms, ten to 100 cells can infect a person. We need to have very sensitive, very fast screening tools. Processing a large number of samples in a short period of time is one of the critical needs.”

In the event of intentional, unintentional, or natural human exposure to infectious agents, the information the center develops will be crucial to assisting first responders and policy makers in protecting lives and setting decontamination goals. The CAMRA team was awarded a total of $10 million from the EPA and DHS for five years of study, and Hashsham is one of the four co-PIs from MSU.

According to Andrew Avel, acting director of the National Homeland Security Research Center in the EPA, the CAMRA team presented an extraordinarily strong proposal. “We at the EPA are extremely excited to be able to award this grant,” said Avel at an October 24 press conference to announce the new center. “We consider this one of our toughest technological problems, and we look forward to great results.”

Mike Rogers, Michigan 8th District congressman and member of the Congressional Intelligence Committee, says that the United States needs to do better in the area of food and water safety, and that CAMRA will take a leading role in that effort. “MSU is going to save lives—not only here in America, but around the globe,” says Rogers. “The kind of research coming from MSU is exciting and will impact the world.”

Complementing the work he does with CAMRA, Hashsham is currently developing a series of microfluidic chips that can screen for the DNA of between 20 and 90 known pathogens—many of which are water-borne—with a single test. “If there’s one thing you can do in terms of safety, it’s to make sure the water is safe,” says Hashsham. “If you just make sure people have safe water for drinking and swimming, you’ve saved lives.”

Hashsham was also named the 2005-2006 Edwin Willits Associate Professor of Civil and Environmental Engineering during spring commencement ceremonies on May 8, 2005. The title of named chair is presented to a highly-accomplished, tenure-track faculty member based on research accomplishments and the individual’s graduate student advising and mentoring record.
He will receive a five-year annual stipend of $5,000. He also received the title Edwin Willits Associate Professor of Civil and Environmental Engineering. The award title was chosen to honor the former College of Engineering dean who is now deceased.

“Because the award is named after the “Father of Engineering at MSU,” I treat it as a sign of recognition and appreciation for the changing nature of engineering today,” says Hashsham. “Today’s engineering is more focused on micro and nanoscale structures and really does wonders when it crosses traditional boundaries.”

Hashsham received his PhD in environmental engineering and science from the University of Illinois in 1996. He was a visiting research associate at MSU from 1996 to 1998 and at Stanford University from 1998 to 1999. He joined the College of Engineering as an assistant professor in 1999. His current research interests include the development of in situ synthesized and glass slide-based microchips for water safety, microbial ecology, biotechnology, and mathematical modeling of molecular data. He is also interested in developing and using genomic and molecular tools to solve environmental engineering problems. During his career he has been awarded 17 research grants totaling more than three million dollars.

Assistant Professor Milind Khire, won the 2005 Editorial Board Member Exemplary Service Award from the ASCE Journal of Geotechnical and Geoenvironmental Engineering (JGGE). The award was presented at the ASCE GeoCongress Heroes Luncheon in Atlanta on March 1. Khire, who is one of approximately 50 JGGE editorial board members, was presented the award in recognition of his tireless work managing article submissions and overseeing conference planning. He has managed the publication process for approximately 40 research articles during his tenure with the JGGE. Professor Khire is also a member of the Geo Institute’s Committees on Environmental Engineering and Geosynthetics.

Two New Grants Spur Research on Membranes for Drinking Water Quality Control

Research teams in the Department of Civil and Environmental Engineering recently received two NSF grants to investigate water purification using membrane technology. The first grant, worth $2.3 million, was awarded to Tom Voice, professor; Volodymyr Tarabara, assistant professor; Merlin Bruening, chemistry associate professor; a research team from Duke University, and a group of international researchers at five universities in Ukraine, France, and Russia. The proposal, entitled “USA-Ukraine-France-Russia Partnership: New Generation Synthetic Membranes – Nanotechnology for Drinking Water Safety,” is funded by the NSF Office of International Science and Engineering via the Partnership for International Research and Education (PIRE) program.

The second grant was awarded to four MSU engineering faculty members through the NSF Nanoscale Interdisciplinary Research Team (NIRT) program. Susan Masten, professor, Tarabara, Melissa Baumann, chemical engineering and materials science associate professor, and Simon Davies, biosystems and agricultural engineering specialist, were awarded $1.44 million to investigate “Self-Cleaning Ceramic Membranes for the Removal of Natural and Synthetic Nanomaterials from Drinking Water Using Hybrid Ozonation-Nanofiltration.” Joining the team is Tom Diets, Lansing Community College (LCC) Science Department chair. Diets will help the team enhance the science curriculum in the area of nanotechnology for K-12 students and develop a specialized nanotechnology program within LCC.

The new hybrid technology will enable the deployment of a highly efficient self-cleaning membrane filtration system capable of removing nanoscale contaminants. Ozonation could not only prevent membrane fouling, but could also disinfect the normally toxic concentrate water that is a by-product of membrane purification. Water pollutants targeted in this project are newly synthesized nanomaterials with demonstrated cytotoxicity and naturally occurring nanoparticles, which are known disinfection by-product precursors. This is the first project that will address the issue of the removal and treatment of waters laden with synthetic nanomaterials.

Membrane processing of water is a dynamic and critical area of research and one that has historically been international in scope. The partnership will address the issue of drinking water safety by focusing on two primary research thrusts: nanomaterial-enabling membrane technology; and membrane fouling. The researchers will focus their investigations on porous nanofiltration membranes used to remove contaminants from water, and on reverse osmosis membranes that can be used to desalinate water. The results of this project in environmental engineering should represent a substantial advance in the understanding of water treatment membranes.

Michigan State University undergraduate students working on the project will also participate in an environmental engineering, science, and public policy study abroad program in Kiev, Ukraine. According to Tarabara, students will have the opportunity to learn how scientists operate in other countries. “We are preparing our students for the increasingly global job market,” says Tarabara. “When they graduate they will be better prepared to compete with their European Union counterparts.”

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Civil Infrastructure Lab Provides Unique Experience for Students

Civil and environmental engineering students have the unique opportunity to utilize the Civil Infrastructure Lab for everything from undergraduate research projects to doctoral dissertations. Below is a list of students who have worked in the lab since its opening as part of a degree-completion program.

Hassan Salama, Post-Doctoral Researcher
Monther Dwaikat, PhD Student
Mahmoondul Haq, PhD Student
Sherwin Jahangirnejad, PhD Student
Golrokh Nossoni, PhD Student
Milind Prabhu, PhD Student
Victor Hong, Master’s Degree Recipient
Christina Isaac, Master’s Degree Recipient
Keith Kowalkowski, Master’s Degree Recipient
Mario Quagliata, Master’s Degree Recipient
Aradhana Sharma, Master’s Degree Recipient
Deepa Thandaveswara, Master’s Degree Recipient
David Bendert, Master’s Student
Andrew Pauly, Master’s Student
Steven Franckowiak, Undergraduate Researcher
Allan Hahn, Undergraduate Researcher
Benjamin Pavlich, Undergraduate Researcher

Naming Opportunities Help Your Name and Your Gift Live On

Naming opportunities at the Civil Infrastructure Lab are still available. Opportunities include: one faculty office, the Civil Materials Lab, the Environmental Testing Lab, the new Structural Fire Testing Facility, and the building itself. For more information, contact Richard McGowan, associate director of development, at (517) 355-8339 or egrdevel@msu.edu.

Parviz Soroushian, professor, secured the initial $500,000 cornerstone gift from Great Lakes Cement Promotion Association for the Civil Infrastructure Lab.

Cover Story Continued from Page 1

hand, the department and college were able to generate in-kind donations and monetary support from alumni and other industry sources, including a second cornerstone gift of $500,000 from Alton (BS ’54) and Janice Granger. Once funding was secured, plans for the new facility were initiated.

In the spring of 2000, Rigoberto Burgueño, assistant professor and Civil Infrastructure Lab director, was hired as a new faculty member to develop a program in innovative materials and structural engineering and to assist in the development of the laboratory. He developed and designed a new concept for the large-scale structural testing area during the spring and summer of 2000. Construction of the facility began in fall 2001 and the building was dedicated in May 2002. Materials testing equipment was moved from the old laboratory space to the new facility immediately thereafter. Burgueño led the custom design, acquisition, and installation of large-scale structural testing equipment, and the first research projects began in December 2002.

“Now we have a well-equipped lab with a good reputation for research,” says Soroushian. “With a strong base to operate from, we can attract new funds and new faculty.”

Building on the Past: Because the new facilities allow faculty to perform full-scale testing, they have been able to draw more funding for research projects. Research done at full-scale is more representative of the physical phenomena that control the behavior and failure of materials and structures, and therefore conclusions drawn from such research can be more accurate. There are several faculty members in the CEE department taking advantage of the facilities to further the knowledge base in the fields of materials, pavements, and structures.

Department Chairperson Ron Harichandran has been working on two projects funded by the Michigan Department of Transportation (MDOT) involving fiber reinforced polymer (FRP) materials. The first project, which was recently completed, involved the development of a sensor to monitor the quality of the bond between FRP and concrete. Harichandran’s new method of testing this bond is less expensive and less complicated than alternate methods.

The second ongoing project is attempting to identify new materials and techniques for repairing damaged concrete bridge beams and decks using a combination of polymer patching materials and FRPs. The first phase of this study, which was recently completed, involved numerical assessment. Currently the research is in the materials-testing phase. “The development of innovative and durable structural systems and materials is very important to the future of civil engineering,” says Harichandran. “This research has the potential to save a great deal of money that comes from public funding.”

Burgueño is involved in a large number of research projects at the new facility. In addition to working with Harichandran on an FRP study, he is investigating high-performance concrete and rapid construction concepts for bridge applications. In a project from the Precast/Prestressed Concrete Institute (PCI) he is examining the bond performance of pre-stressing strands on self-compacting concrete (SCC) precast girders. In a project funded by MDOT and the Federal Highway Administration (FHWA) he is evaluating bridge box girders made from SCC and deploying them in a demonstration bridge that will be continuously sensor-monitored. Nelson Engineering funds Burgueño’s evaluation of the performance of low-profile steel-box/concrete composite bridge girders for rapid bridge construction.

Rigoberto Burgueño, assistant professor, at work in the Civil Infrastructure Lab.

This research has the potential to save a great deal of money that comes from public funding.”
He also leads two investigations funded by the National Science Foundation (NSF). In one project he is working on the development and computer modeling of nano-reinforced bio-composites, also known as plant-fiber reinforced bio-polymer composites enhanced with nano-silicates. The goal is to develop and demonstrate material systems and structural configurations in which this new material can be used in load-bearing panels and beams in residential construction. This new hybrid composite material is inexpensive and recyclable, in addition to being based on rapidly renewable resources. This research is being done in conjunction with MSU’s School of Packaging and the Department of Chemical Engineering and Materials Science.

Burgueño is also attempting to evaluate the seismic performance of thin, high-strength concrete walls under extreme shear demands. The project was awarded under NSF’s George E. Brown Network for Earthquake Engineering Simulation (NEES) program, and is aimed at mitigating seismic risk in the United States. Burgueño will use MSU’s new laboratory to perform full-scale component testing under simulated seismic loads and will subsequently utilize the shared-use NEES facility at the University of Minnesota, Twin Cities. He is attempting to evaluate the seismic performance of wall assemblies that are typical in high-rise buildings and the hollow columns of large bridges, under multi-directional seismic demands.

Associate Professor Neeraj Buch is working with MDOT on concrete materials and pavement research. He is analyzing whether misaligned dowel assembly systems in jointed concrete pavement slabs will hasten deterioration under accelerated axle loading and thermal expansion conditions. The objective of the studies is to determine if improperly installed joint fittings will cause accelerated wear under the stress of heavy traffic or extreme environmental conditions. “We couldn’t have done these experiments prior to the opening of the lab,” says Buch. “I feel comfortable in saying that if we win a project, we can do what we’re proposing.”

Karim Chatti, associate professor, is studying the impact of large trucks with different axle configurations on pavement wear rates. His MDOT-funded research will look at what bearing Michigan’s heavy truck policy has on road conditions. Currently, Michigan is the only state that allows heavy trucks with universal axle configurations on the road. In addition to investigating asphalt cracking and rutting using the asphalt laboratory in the Engineering Building, Chatti’s team is conducting concrete beam fatigue testing and full-scale slab testing to look at joint and existing crack deterioration. Much of the concrete research is done at full scale, requiring the Civil Infrastructure Lab’s large hydraulic pressure pumps to simulate the stress of multiple axle configurations. “I don’t know how people survived without the lab,” says Chatti. “Clearly they weren’t able to perform the kind of research they would have liked to.”

Bridges to the Future: With so much research and teaching success in a short period of time, there’s only one way to go—up. With its modern design and equipment, the Civil Infrastructure Laboratory has joined the ranks of a select group of research facilities in the country. In fall 2006, the lab will begin an expansion by adding a truly unique feature—a propane-fueled test furnace. The furnace, capable of producing temperatures in excess of 2,000 degrees Fahrenheit, will be used to study the effects of fire on materials and structural systems such as beams, columns, and slabs. The specially built furnace can simulate the temperatures, heat transfer, and loads endured by structures in an actual fire. Once operational, the new piece of equipment will be the only one of its kind in a U.S. university setting.

To carve out a niche in the crowded structural engineering field, CEE hired Professor Venkatesh Kodur, in August. An internationally renowned structural fire engineering researcher, he will utilize the new furnace to lead structural fire safety research in the department. Kodur came from the...
National Research Council in Ottawa, Canada, and has been studying fire structural safety issues for most of his career. He was a member of the Building Performance and Assessment Team (BPAT) set up by the Federal Emergency Management Agency (FEMA) and the American Society of Civil Engineers (ASCE) following the terrorist attacks on 9/11.

Kodur and other members of the BPAT team were at ground zero within three weeks of the attack to investigate the cause of building collapses at the World Trade Center and surrounding structures. The team’s report was placed before congressional investigation committees in March and May of 2002. “Had there been no fires, the towers would be standing today. People basically lost faith in buildings on 9/11,” says Kodur. “There is a serious lack of knowledge in the area of structural fire safety. The proposed research activity is aimed at improving the safety of the built infrastructure where we are supposed to work, live, and function effectively.”

Even with so much success in the lab, there are challenges to the operation of such extensive activity. According to Burgueño, one of the major issues will be maintaining the lab for current and future use. “We are certainly excited about the success of our research activities, but this same effort will wear down equipment and facilities,” he says. “One of our biggest challenges for the near future is to find new sources of funding for operations and management, which is not typically covered through research grants.”

Even with the prospect of funding challenges, Burgueño emphasizes the tremendous opportunities that the new lab affords. “We are certainly more competitive for state and federal grants now, but we need to expand and integrate our research with the broader vision of the college and the university,” says Burgueño. “The message I would like to send is: Thank you, the Civil Infrastructure Laboratory is a reality, a great asset that we can be proud of, and its launching is a success—but this shouldn’t be the end.”

If you would like to make a donation to research and teaching at the Michigan State University Civil Infrastructure Lab, please contact Richard McGowan, Engineering Development Office, 517-355-8339 or rmcgowan@egr.msu.edu.

Niell Elvin

Niell Elvin, assistant professor, joined the Department of Civil and Environmental Engineering in January 2006. Elvin received his PhD in structural health monitoring from the Massachusetts Institute of Technology and comes to MSU from Midé Technology Corporation where he worked on the design of adaptive structures. He also worked as a research fellow at the Harvard Medical School, where he developed self-powered, implantable sensors.

Elvin says he decided to come to MSU for several reasons. “My father-in-law is at MSU, so I had a close tie and had heard a lot about it,” he says. “When I visited, I also enjoyed the friendly atmosphere. The open nature of the university in both research and teaching makes it a perfect environment.”

Elvin is currently working on cross-disciplinary sensor technology research with the Departments of Veterinary Science and Intercollegiate Athletics. He has also joined established research teams within the CEE department.

Venkatesh Kodur

Venkatesh Kodur, professor, came to the Department of Civil and Environmental Engineering in August 2005. He received his PhD from Queen’s University in Kingston. Before coming to MSU, he worked as a senior research officer at the National Research Council of Canada (NRCC) in the structural fire safety field. His research interests involve evaluation of the fire resistance of structural systems through numerical modeling and large-scale fire experiments, characterization of materials under high temperatures, and non-linear design and analysis of structural systems. Kodur was part of the FEMA/ASCE Building Performance Assessment Team that investigated the collapse of the World Trade Center buildings as a result of the September 11, 2001 terrorist attacks.

“I would like to set up the structural fire safety research at MSU that is very much needed in the United States,” says Kodur. “This should help to graduate highly qualified students to undertake innovative and cost-effective designs while keeping fire safety in mind.”

Kodur was also recently advanced to the status of fellow by the American Society of Civil Engineers (ASCE). Fellow status is awarded in recognition of significant contributions to research. Kodur joins the fewer than four percent of ASCE’s total membership who have attained fellow status.
Recent Donors to the MSU Department of Civil Engineering

Individuals

Joseph & Diane Alberts
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Reginald & Lois Batzer
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Mu-Tsang Chen
Roy Jr. & Julia Colby
David & Nancy Lakin
Matthew & Amy Lantinga
Paul & Marie Larsen
Wanda Lau
Eric Lentz
Frederick Levantrosser
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James & Marianne Lubkin
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Jon & Victoria Mills
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James Nordberg
Jolene Northrop
John & Beverly O’Malia
Laurence & Joan Pate
Lynnette Payne
James Potter
Christopher & Deborah Potvin
Jeffrey Rathbun
Frank & Ethel Reynolds
Keith & Karen Risdon
Donald & Helen Ryan
John & Laura Safran
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Ben Maibach III was presented the Department of Civil and Environmental Engineering Distinguished Alumni Award in May and the Michigan State University Alumni Association Distinguished Alumni Award in October. The CEE award is presented to graduates of the department who are national leaders in their field and have made significant contributions to the department, the college, the university, and the community. The MSUAA Distinguished Alumni Award is the highest honor bestowed by the alumni association and is presented to graduates who have demonstrated outstanding volunteer service and have achieved the highest level of professional accomplishment.

Maibach earned a bachelor’s degree in civil engineering at Michigan State University in 1968. He began as a laborer at Barton Malow in 1964 and advanced through positions of increasing responsibility, ultimately becoming chairman in 2002. Under his guidance, the company grew from a single office in Southfield, Michigan, to a $1-billion-a-year enterprise, with five regional offices, and specialties in health, education, industrial construction, and sports facilities. Projects have included: Shriners Hospitals for Children, Detroit Metropolitan Airport, Soldier Field Stadium (home of the Chicago Bears), and the historic renovation of the Cathedral of the Most Blessed Sacrament in Detroit. Recently, Barton Malow completed the Spartan Stadium addition on the MSU campus.

The company has won awards for encouraging diversity, for excellence and innovation in construction, for construction safety, and for employee empowerment. Barton Malow, the first construction company in the nation to have a profit-sharing plan for its employees, has been repeatedly ranked as one of the best places to work.

Maibach, a lifelong resident of Detroit, devotes about 500 hours per year to charitable and civic causes in the Detroit area. Community service has become a key value within his company’s corporate culture. He has served as director and chairman of the Detroit Regional Chamber of Commerce and of the YMCA of Metropolitan Detroit, and on the boards of New Detroit Inc., the Community Foundation for Southeastern Michigan, the Detroit Economic Club, and the United Way.

He has worked with the Committee to Rebuild Detroit, Paint the Town, Hospice of Southeastern Michigan, and Wellspring. Maibach and his wife, Barbara, also an MSU graduate, have generously supported MSU over the years, as evidenced by their membership in the John A. Hannah Society.

The Engineering Society of Detroit gave Maibach an Outstanding Civic Involvement Award and membership in their College of Fellows. He received an honorary doctorate of engineering in 1996 from Lawrence Technological University and was named WJR radio station’s Humanitarian of the Year in 2002.

Maibach serves as a powerful role model and a mentor to young people interested in architecture and engineering.

Beth Chappell, president and CEO of the Detroit Economic Club, says Maibach is “living proof that one person can make a huge difference in the lives of many.” She adds, “Ben always finds a way to invest his time, talent, and treasures to help others. He is known throughout the Detroit region and beyond as a tireless community leader who has worked hard and smart on various community initiatives through the years—with many successes to show for his efforts.”

The Department of Civil and Environmental Engineering wishes to thank Leroy (BS ’66) and Cheryl Dell for establishing an endowed fellowship to support the efforts of promising graduate students pursuing advanced degrees in civil or environmental engineering. The $35,000 Dell Graduate Endowment will give precedence to students in environmental engineering, and award recipients will be selected during the spring semester.

Endowment sponsors Leroy and Cheryl Dell have long been committed to MSU and the College of Engineering through service and philanthropy. Leroy has tirelessly served his alma mater on the Professional Advisory Board of the Department of Civil and Environmental Engineering, as a member of the College of Engineering’s Alumni Board of Directors, as a member of the MSU Development Program’s Board of Directors, and as a member of the MSU Alumni Association’s Board of Directors.

In recognition of his professional achievements, Leroy has been the deserving recipient of numerous awards, including: The 1992 Michigan Water Environmental Federation Shepard Award; the 1998 MSU Alumni Association Service Award; the 1999 MSU College of Engineering Claud R. Erickson Distinguished Alumnus Award; and the 2004 MSU Department of Civil and Environmental Engineering Distinguished Alumni Award.
Shaw Family Establishes the Rory M. Shaw Memorial Endowment

Shirley Shaw, the mother of MSU Alumnus Rory M. Shaw (BA ’79 Mathematics, BS ’84 Civil Engineering) tragically killed in a sinkhole accident, recent February in Los Angeles, has established the Rory M. Shaw Memorial Endowed Scholarship/Fellowship Fund for full-time civil and environmental engineering students. Contributors to the fund include Shaw’s family, friends, and colleagues. According to the personal statement in the endowment agreement, the $30,000 fund will honor the memory of someone who was on a continuous quest for knowledge.

“He would be happy to know that at least his name continues in the relentless pursuit of knowledge,” wrote Shaw’s sister, Leslie Botti. “Providing the financial means to advance the education of another truly questioning mind would be most satisfactory to him.”

Mackenzie Davis, professor emeritus and former concrete canoe team coach, also fondly remembers Shaw’s enthusiasm, recounting a time that the team had purchased new paddles and Shaw tried to row the canoe so fast he actually broke the paddle. “He was gung-ho about everything—the canoe team, his work, MSU,” says Davis. “He did things with lots of life. Bust that paddle … just give it everything you’ve got.”

After graduation, Shaw was recruited by the Los Angeles Public Works Department and was working as an emergency engineer at the massive Sun Valley sinkhole when the ground gave way and he fell 30 feet to his death. Shaw received many awards during his tenure with the Department of Public Works, including a Meritorious Achievement Award and a Going Beyond Expectations Citation. His technical expertise and commitment to service led him to the position of Chief Emergency Construction Engineer for the city’s 6,500-mile-long sewer system.

Rory Shaw died February 20, 2005 at the age of 47. He is survived by his mother, Shirley; his sister, Leslie (James) Botti; and a niece and nephew. Thank you to the Shaw Family, and to the friends and coworkers of Rory Shaw for honoring the memory of such an exceptional man.

Thomas Benson, Jr. (BS ’81) was recently named president and CEO of Leighton Consulting, Inc., a geotechnical consulting firm in southern California with six offices and 198 employees.

Heather Cheslek (BS ’01) graduated from MIT with a master’s degree in environmental engineering in 2003. She lived and worked in England from May to November 2003, and gave birth to a daughter, Alyssa Gabrielle, on December 15, 2003.

Chris Dronen (BS ’01) and partner Nathan Butler recently started a wool and fleece outerwear company called Urdu Imports. The team would eventually like to sell to select retailers, but currently conduct sales through their website at urduimports.com.

Gregory Gertsen (BS ’92, MS ’93) was recently elected to the status of senior associate/stockholder of Albert Kahn in Detroit, Michigan. Gertsen has been with Albert Kahn since 1993.

Zhihui Huang (PhD ’05) is working with Skidmore, Owings, and Merrill in San Francisco, California on the Nanjing Gulou Square project in China. The project will include an 88-story building, a 22-story building, and a 30-story building.

Fritz Klingler (BS ’87, MS ’88) was elevated to a Chi Epsilon Chapter Honor Member in November 2005. Klingler is a vice president of NTH Consultants, Ltd. He works in the Detroit office, and presently serves on our Civil and Environmental Engineering Professional Advisory Board.

Kerri A. Miller (BS ’97) earned her Professional Engineer registration in March, 2004. She is employed with Fishbeck, Thompson, Carr & Huber, Inc.

Timothy J. Mitchell (BS ’80, MS ’81), the regional manager for the Kalamazoo office of Soil and Materials Engineers, Inc., was recently named a principal in the firm.

Madzlan Napiah (BS ’85) received his MSc and PhD at Leeds University in The United Kingdom. He is currently head of the Department of Civil Engineering at the Universiti Teknologi Petronas. Napiah married during his junior year at MSU and currently has six children, ranging in age from three months to 19 years old.

Richard Pian (Professor, College of Engineering 1948-1959) passed away from ALS (Lou Gehrig’s Disease) March 15, 2005 at a hospice center in Mesa, Arizona. Pian was born in Tianjin, China in 1917. He began teaching at MSU in 1948 and moved on to Arizona State University in 1959. He traveled and lectured extensively in Asia during his career. Pian retired from Arizona State University in 1984 but continued to work actively as a consulting structural engineer in Phoenix. He is survived by his wife, Mabel, and their four children Lanna, Thomas, Robert, and Donald.

Mario Quagliata (BS ’01, MS ’03) started work as a structural engineer for Bergmann Associates in June 2004. He works with six other MSU alumni.

Abdeslam Reklaoui (MS ’89) is working as a self-employed civil engineering consultant on multiple projects in Tangier, Morocco. His daughter, Shirin, who was born at MSU, is now enrolled in the school of architecture at the University of Virginia.

Steven M. Roberts (BS ’91) joined Wade Trim’s Governmental Services Group in February 2005. He will be responsible for assisting clients with project development, maintaining ongoing relationships, and managing projects for local government clients.

Jongsung Sim (MS ’84, PhD ’87) is a professor of civil and environmental engineering at Hanyang University in South Korea and is a member of the National Academy of Engineering of Korea. He has published more than 100 papers.

Michael J. Thelen (BS ’91, MS ’92), the senior project engineer for the Lansing office of Soil and Materials Engineers, Inc., was recently named a senior associate in the firm.

Anthony Thomas (BS ’92, MS ’94) was elevated to a Chi Epsilon Chapter Honor Member in April 2005. Anthony is a senior project engineer at the Detroit office of NTH Consultants, Ltd.

continued on page 15
The Michigan State University Department of Civil and Environmental Engineering Welcomed the Following Members to the Professional Advisory Board in 2004 and 2005:

Barbara Arens, P.E., PTOE
Parsons Brinckerhoff
Michigan, Inc.
Detroit, Michigan

Larry Fleis, P.E.
President,
Fleis & Vandenbrink
Engineering, Inc.
Grand Rapids, Michigan

John Holmstrom
Vice President,
The Christman Company
Lansing, Michigan

Fritz J. Klingler, P.E.
Vice President,
Geotechnical Engineering,
NTH Consultants, Ltd.
Detroit, Michigan

Philip Sanzica, P.E.
Chief Engineer, Oakland
County Drain
Commissioner’s Office
Waterford, Michigan

James Susan, P.E.
Fishbeck, Thompson,
Carr & Huber
Grand Rapids, Michigan

Linda Sturgess
Manager, Environmental
Services,
EPW C. Levy Co.
Detroit, Michigan

Larry Tibbits, P.E.
Chief Operations Officer,
Michigan Department of
Transportation
Lansing, Michigan
Faculty Connections “Two New Grants...” Continued from Page 7

According to Tarabara, the global market for membrane technology is expanding rapidly as people begin to understand the benefits of this process. “The most important advantage is that membranes provide an absolute barrier to contaminants—including pathogens,” says Tarabara. “Conventional treatment methods don’t. This can result in contaminated drinking water.”

Tarabara also says that as people learn to make inexpensive membranes, low-cost, high-quality drinking water will be within everyone’s reach. “As environmental engineers we see our end-goal as ensuring that pure and inexpensive water is available for everyone. With these two new grants, we are looking to move closer to achieving this goal.”

Burgueño Receives 2005 Withrow Teaching Excellence Award

Rigoberto Burgueño, assistant professor, received the 2005 Withrow Teaching Excellence Award at the 15th Annual Engineering Awards Luncheon March 31, 2005 at the University Club in Lansing. A Withrow Award winner must demonstrate command of course content, create an effective learning environment, deliver course material well, be available to students, be able to elicit enthusiastic learning, participate in student organizations and projects, and be an effective advisor and mentor. The student body has primary responsibility for nominating and selecting the winner.

Alumni Connections Continued from page 13

Guy S. Vissing (BS ’48) retired in 2004 after 45 years working for various departments in the U.S. Government. Vissing’s last 32 years were spent working with the U.S. Nuclear Regulatory Commission as a senior project manager for several nuclear power plants and nuclear test reactors.

James K. Wright (BS ’69, MS ’70), professor, was appointed the Frank E. Richart, Jr. Collegiate Professor of Civil Engineering at the University of Michigan. Wright is a fellow of the American Concrete Institute (ACI) and currently serves as the chairperson of the ACI Building Code Committee. He has won many awards for teaching and service excellence, and is the author of a textbook on the design of concrete structures. Wright recently served a six-year term on the CEE department’s Professional Advisory Board.

Faculty Travel to South Korea to Find Familiar Faces

On a recent visit to South Korea, CEE faculty members enjoyed a meal with alums. Left to right: Myung K. Chang (PhD ’94); Jongsung Sim (PhD ’87); Hyung Bae Kim (PhD ’99); Doseung Lee (PhD ’01); Neeraj Buch, associate professor; Karim Chatti, associate professor; Michelle Baladi; Gilbert Baladi, professor.

A Legacy of Service


Transportation Research Board Annual Meeting attendees enjoy the MSU, CEE Hospitality Suite at the 2006 meeting January 25 in Washington D.C. Left to right: Ronald Harichandran, professor and chairperson; Kyong-ku Yun, professor; Kangwon National University; François Dion, assistant professor.
I wish to support the students, faculty, and facilities of the MSU Department of Civil and Environmental Engineering.

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