The light at the end of the [economic] tunnel

The ART of Re-construction

Up Close: Students
CEM students honored with “Outstanding Student” award

Campaign Impact
Legendary alumnus honored with endowment

Up Close: Alumni
One of CEM’s first alums looks back (and ahead)
On My Mind

Welcome to the Fall 2009 issue of Construction Engineering and Management Impact. The focus of this issue is the economy, a topic that is on the minds of constituents both within and outside the university.

As you will see in the pages to follow, Purdue’s division of CEM and its constituents—alumni, industry partners, faculty, and students—are at once being affected by and responding in meaningful ways to the situation. While the economy continues to put a strain on these entities, we are hopeful that, with the help of professionals and researchers in the construction engineering field, U.S. and the global community will soon be moving toward viable and long-lasting solutions.

With an eye toward improving quality of life and enacting lasting change through construction engineering, we hope that this issue of Impact offers some fresh perspectives during these challenging economic times.

Makarand Hastak
Professor and Head of Construction Engineering and Management
COMING UP

AROUND CEM
CEM celebrates a milestone birthday, more…

IN MY VIEW
Alumnus Dean Towl shares his insights on the industry

COVER FEATURE
The art of re-constructing

UP CLOSE: STUDENTS
CEM students recognized with engineering award

UP CLOSE: FACULTY
New faculty members bring breadth of experience

CAMPAIGN IMPACT
New endowment honors CEM legend Donn Hancher

UP CLOSE: ALUMNI
Early CEM graduate reflects on the program’s success

SAFETY CHECK
Training is key to on-the-job safety

Calendar 2009-2010

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Mark Your Calendars

INDUSTRY EXPO
December 3, 2009
Purdue’s construction engineering and management division celebrated the 30th anniversary of the first graduating class in April with a reception at the Purdue Memorial Union.

Honored at the event were the seven members of that inaugural class (1979): Andrew Arbuckle, Edgar Boettcher, Allen Dall (deceased), John Frantz, Jim Mansdorfer, Jeffrey Suiter, and Anne Bigane Wilson. Among the attendees at the event was the CEM class of 2009 and guest speakers included Frantz, president of Sidney Electric Company, and Daniel Halpin, former head of CEM. For more on Frantz, see the Up Close Alumni section of this issue.

Heroes Award celebrates unsung dedication

At this year’s Heroes Award celebration, nominees from across the university community came together to learn about each other and celebrate their individual and collective dedication to the Purdue spirit. Meant to recognize the uncelebrated heroes in the Purdue family, the award shines a spotlight on those “who have acted with persistence, selflessness, and integrity to overcome adversity, achieve an ambitious goal, and positively influence those around them.”

CEM’s own Bonnie Sondgeroth, secretary for the division, was nominated this year. Anyone who has worked with Bonnie knows that she embodies the inspiration and Purdue spirit of the award. In her role within CEM, Bonnie primarily serves undergraduate students, personally investing her time and efforts to make sure that each of the students receives personal care and attention, even beyond graduation. She fosters a sense of family and camaraderie among students starting in their first semester. Her enthusiasm for the students and what is possible boosts their spirits and attitudes in a way that translates into their success, both academically and professionally.

Congratulations, Bonnie, on a well-deserved nomination!
Dean Towl, LEED AP (BSCNE ’91)
Scheduling manager and training & development manager, Mortenson Construction

Alumnus Dean Towl has made a successful career with M. A. Mortenson Construction Company. Here, he shares his personal thoughts on an industry that continues to grow despite the economic downturn.

—Q— How did you become interested in construction engineering and management, and what inspired you to pursue a career in the field?

—A— Interest in building has always been in my blood. I’m embarrassed to admit that constructing things in the sand box was my favorite activity late into adolescence. My sand box has just grown larger over the years. It was sheer luck that I decided to study engineering at Purdue. Donn Hancher and the late Lloyd Jones caught my attention in Engineering 100, and it was history from there!

—Q— How has the industry changed since you first entered the field? Do you see these as positives or negatives?

—A— The exponential increase in facility construction complexity has driven a corresponding increase in the pace of change. The saying “necessity is the mother of invention” has never been more apparent. Ingenuity is mandatory to compete in this new marketplace. Our customers have come to expect effective on-the-fly response in the face of these ever increasing challenges. New technologies mark a shift from the traditional brute force paradigm of previous decades. We’re catching more potential conflicts in computer simulations versus paying tradespersons to inefficiently force errant materials to fit into place. We are better able to keep challenges from becoming show-stoppers.

I’m also happy to see our customers’ openness to alternative project delivery methods like design-build and integrated project delivery. It’s much more rewarding as a builder to get involved early in the design of a facility. These are both very positive changes that I hope to see evolve further in the coming years.

—Q— Attention to environmental impact is a hot topic in the industry today. How do you feel the construction engineering and management field is addressing those concerns?

—A— The current interest in building “Green” may prove to be this decade’s buzzword like “TQM” or “Partnering” of prior decades, but this generation has the opportunity to make it our legacy. And clearly it’s the right thing to focus on. If you don’t buy in yet, take a trip to our oceans, focusing on the ever-increasing quantity of indestructible plastic assaulting the shores. A recent visit to Southeast Asia highlighted the need for a global environmental focus for me. Thankfully, interest in sustainable development, embodied in the USGBC’s LEED standards, continues to increase. We have some maturing to do as an industry, but there will be a day when this circle closes and today’s sustainable “best” practices become tomorrow’s “standard” practice. An ancient Kenyan proverb begs us to answer the question: Are we making an adequate commitment to the environment that our children and grandchildren are loaning to us?

—Q— What have been the key motivating factors for you as a leader in the industry, in other words, what keeps you going to work every day?

—A— Hanging on to that childhood love for constructing helps me see past the daily speed bumps. Seeing the physical fruits of our labor as constructors is somehow internally satisfying and motivating beyond any external factor. Watching a facility take shape after months or even years of preplanning makes it all worth it. The old saying “the more you know, the less you know” proves to be true every day. My thirsts for variety and learning never fail to be satisfied. Implementing new technology and sharing learning really helps complete the circle of fulfillment for me.
Recognized as industry leaders, their projects range from health care facilities, baseball stadiums, and bridges, to campus buildings, corporate headquarters, and cultural/performing arts centers. And although they remain rooted in longtime family ownership, their branches have expanded nationwide, touching the commercial/industrial, health care, and infrastructure sectors.

Collectively, The Hagerman Group, M.A. Mortenson Company, and The Walsh Group serve as a microcosm of an industry rocked by a rapid and largely unanticipated economic downturn—yet one determined to revive and re-create as a result.

“My grandfather went through the Great Depression,” recalls The Hagerman Group President Jeff Hagerman (BSCEM ’93) of the 101-year-old company’s second generation, “and that was the single toughest crash the market has ever seen. Grandpa had one project—a gas station in Fort Wayne, Indiana.

“We’ve had a number of downturns and fought the rollercoaster a few times since, but today’s economy is second only to the Depression,” Hagerman adds. “It was amazing how quickly this cliff came, and how it sent a huge ripple effect throughout the entire industry.”

The Hagerman Group, Indianapolis/Fort Wayne/Lafayette, Indiana

Diversification among six vertical markets — college and university, health care, K-12 schools, institutional, industrial, and commercial/retail—has helped Hagerman Construction navigate current economic waves. Another buffer is the trio of companies under the Hagerman umbrella: Hagerman Construction, founded in 1908 by William Hagerman and brother-in-law Frederick Buesching; Hagerman Inc., created in 1992 to offer additional general contracting services with greater delivery flexibility; and Geupel DeMars Hagerman, a nationally recognized construction manager acquired by Hagerman in 1998.
"Expectations are for a drop in revenue in ’09 of 20 percent or more in a more highly price-driven marketplace,” says Towl, who joined Mortenson in 1991 and currently serves as training and development manager and scheduling manager. “Presently, cost is king in the marketplace.”

Headquartered in Minneapolis, Minnesota, the company was founded by M.A. Mortenson Sr. in 1954. In 1990, Mortenson reached Engineering News-Record’s list of top 50 contractors, and has remained in that bracket since. In ENR’s most recent list, Mortenson was ranked the country’s 22nd largest general builder, with annual revenue of approximately $2.5 billion.

According to Towl, some market sectors like residential infrastructure and site development have been severely affected. The company’s game plan is to focus efforts in more active sectors, such as federal government projects, R&D and manufacturing facilities for renewable energy products, and higher education facilities. The company continues to thrive on the challenge of architecturally complex projects and stadiums as well.

“We’re presently experiencing a downturn in the renewable energy sector, such as wind generation projects, primarily due to tight capital markets,” Towl says. “But we anticipate that the government’s actions in the banking industry and the federal stimulus package will help remove some of the barriers, allowing more alternative energy generation projects to move forward.”

At Mortenson, technology also will power the company’s future. Specifically, Mortenson Construction is an industry leader in the use of Building Information Modeling (BIM), which employs three-dimensional, real-time, dynamic building software that increases productivity and reduces costs throughout the building and design process. “This is the future of the industry,” says Towl, adding that BIM is likely the most significant construction technology to gain industry-wide acceptance since Computer-Aided Design (CAD). “Effective use of BIM is now the price of admission on many complex projects.”

One example of the software’s capabilities is the Walt Disney Concert Hall in Los Angeles, completed by Mortenson in April 2003. The company adopted the use of the virtual building process to translate unique design elements and shapes to a computerized model from which...

>continued on next page
building components could be fabricated and installed. Mortenson also integrated its construction schedule with the 3D database to create one of the first uses of four-dimensional simulation in the building industry. Mortenson has been implementing BIM for over 10 years.

"As a company, we’re rolling up our sleeves and working harder than ever before," Towl admits. "And we’re asking our team members to be flexible, patient and open to change in response to the present market conditions."

“But we’ve weathered these kinds of cycles in the past, and we’re positioning ourselves to come out smarter, and thus stronger, on the other side.”

The Walsh Group, Chicago, Illinois

When it comes to tough economic times, there’s power in partnerships; specifically, alliances that apportion the risk and build for the future.

“We’re joint venturing more now than we have in the past,” says Jeff Lemna (BSCNE ’88), director of corporate training for The Walsh Group. “It’s part of the company’s culture—to develop relationships and create opportunities for the future.”

A 110-year-old family business in its third generation of leadership, The Walsh Group provides services through its two subsidiaries—Walsh Construction and Archer Western Contractors—and maintains twelve regional offices. The company employs approximately 6,100 managerial and hourly workers.

Diversity has been key for Walsh throughout the decades. While the private condominium/apartment and health care markets have virtually “dried up,” Lemna says the company’s airport and bridge sectors are showing strength. One joint venture example is a recent $400 million contract with Sacramento County to build Landside Terminal B at the Sacramento International Airport, a project that includes the terminal, administrative building, central utilities plant, and an automatic people mover station.

In May 2009, Walsh Construction also was awarded a $59 million contract to replace the Amelia Earhart Bridge, which spans the Missouri River between Atchison, Kansas and Buchanan County, Missouri. The existing two-lane structure will be replaced with a ¾-mile, four-lane bridge.

“The recession has definitely affected the work we’re pursuing,” Lemna admits, “and although it’ll be a challenge going forward, we have a pretty solid backlog that will allow us to keep our employees busy through 2009.”

According to Lemna, Walsh’s financial strength enables the company to focus on large, multi-million dollar projects instead of relying on smaller projects that may attract influxes of unqualified or inexperienced bidders.

“We’re seeing far more bidders on smaller projects, and are finding that some pricing can be irresponsible.”

The company also has prioritized its workforce. “Throughout this downturn, we’ve needed to relocate our management people much more frequently,” Lemna says. “We’ve traditionally prided ourselves in keeping managers within the same regional office for years, but are now needing to move people based on where we have work.

“Building Back Up?"

Although they acknowledge their looking glasses may be no clearer than anyone else’s, construction and management industry leaders offer their personal prognostications regarding an economic rebound:

“This recovery will be unique. In most recessions, you see a downturn, a trough, an upturn, and then things are rolling again. In respect to our industry, I think we’ll soon see the bottom, followed by a quick, significant ramp up in opportunities related to the federal stimulus package and TARP funding, all within the next 2-3 years. But then I believe we will have another downturn correction prior to full recovery. Instead of a typical U-shaped pattern, this recession will resemble a W.”

Jeff Hagerman, president, The Hagerman Group

“I certainly think the rest of this year will be challenging, and next year will be much the same. By 2011, things might get better. The Federal Stimulus Program might help with smaller projects, but I don’t think it will make a big difference for companies like ours. Based on President Obama’s desire for high speed rail, though, transportation jobs will be released sooner rather than later. Hospitals will be among the first private market projects to move once the money comes around.”

Jeff Lemna, director of corporate training, The Walsh Group
Constructing Future Leaders

Two CEM students recognized for excellence

Each year, the College of Engineering recognizes students across the engineering disciplines for excellence in their fields with the Outstanding Student Award. Each engineering discipline in Purdue University’s College of Engineering presents this award to one senior and one graduate student. Elected by the faculty, the criteria for winning the award is not just grades or project work but overall achievement and contribution to an engineering major. For the seniors, the award is one more way to mark their success as they prepare for graduation. For graduate students it is a sign of Purdue’s faith and investment in them. The Division of Construction Engineering and Management has chosen two of its finest student-leaders to receive the award this year. These students are senior Alex Hahn and graduate student Nader Naderpajouh.

Hahn has been eagerly pursuing his future in CEM since his freshman year. After getting his start in the Freshman Engineering program, Hahn quickly discovered his passion and enjoyment for the major. “Purdue does a very good job of telling you about every type of engineering,” said Hahn. While he was interested in many different disciplines, CEM caught his eye because of the hands-on aspect. “I heard that in Construction Engineering you got to go out into the field a lot and there’s a lot more focus on management and coordination; as opposed to just straight design. That’s the reason I joined and since then I’ve really enjoyed it.”

Hahn’s reasons for attending Purdue are three-fold: his parents are alumni, he has held a long-term interest in math and science, and the university’s relative closeness to his Indianapolis home. “It’s a great engineering school and combined with all those other factors, it was an easy choice,” said Hahn.

Hahn has been busy. His junior year he was the banquet chair for the CEM Spring Banquet and this year was part of the student crew that constructed a wheelchair ramp for the Lafayette Habitat for Humanity store. Hahn is vice president of Beta Tau, the fraternity for CEM, and is active in Tau Delta Pi, the engineering honors fraternity. After graduation Hahn will be taking a month off for travel and in June he starts as a project coordinator at Shiel Sexton, an Indianapolis based contractor.

Nader Naderpajouh, originally from Tehran, Iran, is both a student and teacher in CEM. He is pursuing his PhD after getting his bachelor’s in civil engineering and his master’s in construction management. Before returning to work on his

PhD, Naderpajouh worked in the private sector. At Purdue his research is focused on global construction, projects that involve multiple stakeholders from different institutional backgrounds. He is a teacher for such courses as CE 220, 221, 497, 524. “It’s very exciting to receive the COE award,” said Naderpajouh.

Inspired by his father—also a civil engineer—Naderpajouh is very happy to be at Purdue. “I enjoy the international environment and meeting new friends from different countries.” He is planning to continue his research at Purdue and hopes to graduate in a year or so. His advice for incoming CEM students was to embrace mathematics and logic, “In an interdisciplinary major, you have to be diverse to cope with problems in your work.”

Joseph Fowler
New Faces

Incoming faculty bring diverse interests to CEM

This fall, CEM welcomes new faculty members Amr Kandil, Hubo Cai, and Panagiota Karava. The division is excited by the diversity of knowledge and interest areas each bring, and looks forward to watching their expertise and teaching acumen take root in our classrooms and labs.

Kandil comes to Purdue from Iowa State, where he served as assistant professor of construction engineering. Born in Alexandria, Egypt, and having grown up in Dubai, UAE, Kandil studied at the American University in Cairo, receiving his bachelor’s and master’s degrees, before coming to the U.S. to complete his PhD at the University of Illinois at Champaign-Urbana. His particular area of interest is in the applications of artificial intelligence and machine learning in construction contract administration.

Owing his interest in CEM to his mentor, master’s thesis advisor, and first employer—Dr. Sherif Farghal—Kandil soon became particularly interested in contract administration and law. “I always enjoyed coursework in this area, which is a true intersection between engineering and legal knowledge.” This interest in legal knowledge “is partly related to my upbringing since both my parents were lawyers, and my father was a judge for his entire career,” Kandil says.

For Kandil, joining the Purdue CEM faculty is recognition of his potential for growth as an educator and innovator in the field. That recognition, for Kandil, “is one of making a mark in your field, and having an impact on education and research in your discipline.” For Kandil, the challenge of joining a university of Purdue’s caliber presents itself in the tradition of excellence that it represents.

When asked what he loves most about teaching and performing research at the college level, Kandil immediately points to his students. “My favorite part of teaching is when I feel I have positively impacted my students’ lives, not just by delivering to them the subject of my course, but by getting them interested in setting their sights on a path of learning in the discipline I belong to.”

A love of the research endeavor is not far behind. “My favorite part of research is that there is hope that the work you are doing will impact your field of research and industry,” Kandil states. “This hope is what makes research a way of life rather than a daily job to me.”

An interest in the research and teaching possibilities available at Purdue also excites Cai, who joins CEM this fall from Western Michigan University. He grew up in Ningbo, China, and studied at Tongji University before completing master’s and doctoral degrees at North Carolina State University. His area of study is spatial information technologies in civil infrastructure construction and management.

When asked what drew him to CEM as a career, Cai points to a childhood interest sparked by witnessing the entire construction phase of a school building. It was this experience that led him to undergraduate studies in construction, followed by advanced degrees in the U.S. “My first research project was related to GIS applications in transportation infrastructure modeling, which triggered my interest in spatial information technologies and their applications in infrastructure construction and management,” says Cai.

For Cai, joining the faculty at Purdue is significant. “It means a great platform to work with experts in the field of construction engineering and management, many great collaborative opportunities, and a chance to conduct interdisciplinary research to address infrastructure issues.” What is he most looking forward to? “Great people, interesting research, talented students, and a friendly working environment.”

Also joining Purdue’s CEM faculty this fall is Panagiota Karava, who has been serving as assistant professor in civil and environmental engineering at the University of Western Ontario. Watch these pages to learn more about her research and teaching interests in a future issue.

Barbara Leonard
As a renowned and distinguished member of the construction engineering and management field, alumnus Donn Hancher knows the value of bringing top-quality knowledge and research ability into the classroom.

This distinguished alumnus is being honored by colleagues in the construction industry and academic community through the creation of the Endowed Donn E. Hancher Distinguished Fellow within the Division of Construction Engineering and Management. Lead donors to the endowment include Purdue alumni Bob Bowen, PE (BSCE ’62, HDR ’07), chairman and CEO of Bowen Engineering; Anne Bigane Wilson, PE (BSCEM ’79, MSCE ’81), president of Bigane Paving Company; Cliff Schexnayder, PE (PhD CE ’80), professor emeritus at Arizona State University; and Jeffrey Russell, PE (MSC ‘86, PhD CE ’88), professor and chair in the Department of Civil and Environmental Engineering at the University of Wisconsin-Madison.

“Purdue’s construction program is the finest in the world,” says Bowen, chairman of the endowment committee, “and no one has had more of an impact on that program than Donn Hancher.”

The creation of the endowment was celebrated at a luncheon in Hancher’s honor on May 12.

The position of fellow will be held by an experienced construction industry leader and is designed to bring construction industry knowledge into the classroom. The designee will mentor students; support construction industry efforts to encourage members of underrepresented groups to consider construction as a profession; enhance student, faculty, and academic interaction with the construction industry; and mentor construction faculty for leadership at Purdue.

Recently retired, Hancher (BSCE ’66, MSCE ’68, PhD ’72) had served as the Terrell-McDowell Chair of Construction Engineering and Management at the University of Kentucky since 1989. Prior to joining the Kentucky faculty, Hancher served as professor of civil engineering at Purdue from 1972 to 1988.

An active member of the American Road and Transportation Builder’s Association (ARTBA), he has been a leading researcher and teacher of construction engineering for more than 35 years.

With the creation of this endowed fellow position, its supporters will help to bring a world-renowned leader to Purdue, one who will be expected to assist in the teaching of construction courses, to counsel students, and to participate in and lead professional activities. The position will serve a five-year, renewable term, and will be selected by the dean of engineering based on recommendations of a committee composed of the head of the Division of Construction Engineering and Management or designee; a representative from the School of Civil Engineering appointed by the head of the school; a faculty representative in a related engineering area appointed by the dean; the president of the Indiana Construction Association; and the president of the Illinois Road and Transportation Builders Association.

Campaign Impact – Donn Hancher

Endowment creates distinguished fellow position in CEM

The Donn E. Hancher Distinguished Fellow will be chosen from leaders in the construction industry, those who are active and have held demonstrated leadership roles within the industry and within professional organizations. “The practitioner who is brought to campus through this fellow program will take Purdue’s construction engineering program to the next level of excellence and distinction,” says Bowen.

Hancher’s research areas of interest have ranged from construction management and administration, estimating and value engineering, planning and scheduling, construction equipment and methods, and total quality management. Over his career, he has been recognized with numerous awards from the American Society of Civil Engineers, the Chi Epsilon Honorary Society, and from ARTBA.

Upon his recent retirement, Hancher has returned to West Lafayette.

■ B.L.
Forging a Destiny

One of CEM’s first alums offers some insight

For John Frantz, (CEM ’79) construction and engineering were in his blood. So it was only a matter of time before he fulfilled a lifelong goal of owning his own company.

“I never thought I would not own my own company,” Frantz says matter-of-factly. “My father owned a bridge-building business, so in a way ownership had always been my goal. I didn’t just envision working in the field, but working toward operating my own company.”

Frantz achieved that very goal in 1996 when he took over ownership of Sidney Electric Company, based in his hometown of Sidney, Ohio. Frantz also assumed presidency of the company in 2003, though since he started his career at Sidney directly after graduating from Purdue (and actually interned with the company during his undergraduate years), his role has always been in-the-field and directly involved in on-the-ground operations.

He attributes his hands-on management style to his preparation in Purdue’s Construction Engineering and Management program. “Purdue’s CEM program requires you to take a very broad base of engineering courses that relate to multiple disciplines,” Frantz says. “So while I specialized in electrical engineering, I also studied mechanical and civil engineering, as well as taking business management courses. That kind of knowledge in a variety of fields means you don’t back away from areas you don’t perceive to be your specialty; rather, you’re able to get involved across the full spectrum of a project.”

Frantz makes sure that he—and his entire Sidney team—have capabilities that go far beyond their electrical specialty. “When we enter a construction site, we can’t approach a project in a bubble, as if the electrical installation doesn’t require knowledge of the soil, the concrete structure or the mechanical systems,” he explains. “We have to understand the other systems we interface with, where we can and can’t drill, how the mechanical systems work and how the building is being built. All those factors have implications for our own work, so we need to be well versed across-the-board.”

Frantz has also presided over significant growth at Sidney Electric. Since his ownership, the company has opened two additional offices, one in Lima, Ohio, and the other in Muncie, Indiana. “These locations have increased our regional coverage and helped our sales,” says Frantz. “It’s been important given the recent contraction of the economy.”

The economy, Frantz notes, has played a noticeable effect on his industry. “Our client base, being heavily industrial, has certainly deferred some projects over the past couple years and modified their plans. But that’s also given us the chance to pursue some other opportunities.”

And where do those opportunities lie? “What drives our industry is energy efficiency. When I was a student at Purdue in the mid-70s, we went through a significant energy crisis, and we engineered innovations to be more efficient,” Frantz relates. “We’re going through the same cycle now—looking to solar power, wind power. Pursuing LEED certification in our projects. In engineering, efficiency is a never-ending quest.”

Addressing current and future engineering students, Frantz emphasizes the importance of the Humanities. “Those classes you take in English, composition, and psychology have profound effects on your success in this industry,” he advises. “Ultimately, you’re working with people, communicating with them, trying to understand their personalities and points of view. At the end of the day if you can’t relate to people, it doesn’t matter how good of an engineer you are.”

John Frantz (CEM ’79)
Training = Safety
Training \(\text{træ-
{n}iə}\) v. 1: Cause to grow as desired
2: Make or become prepared or skilled.

On its own, a construction site is a dangerous place, and one of the biggest potential dangers is having an untrained person at the controls of construction equipment. That’s why one of the most important safety checks is to make sure that all persons involved with the operating, moving and positioning of equipment have the necessary training to avoid accidents and damage.

One Source is a company that rents out construction equipment and often works with Purdue University. Operators are required to undergo a training course held by the company. The courses are machine-specific and available for no extra fee (a fact that varies among different rental companies).

The training is a universal OSHA requirement. Some companies are large enough that they have their own safety official and handle training themselves.

Typically, the training course is four hours long and is comprised of several activities. Hands-on training, instruction videos, walk around inspections and tests; common courses are ones for scissor lifts, boom-supported platforms, and industrial forklifts. Another type of class is the safety course for carry-deck cranes, which teaches hand-signals, rigging and how to be safely in the vicinity of a crane. The training course to operate a crane is a good example of a more involved class, which takes over 40 hours to complete and must be done off-site.

Josh Dellinger is a territory manager and Purdue rep for One Source who conducts training courses for his customers. He said that safety training is vitally important, “It’s for safe operation and basically to protect you; to keep people from doing something that hurts themselves or others.” Safety training is the first step in any successful construction operation and it could save your life and the lives of others. ■ Joseph Fowler
Researchers have uncovered evidence suggesting that factors other than genes could cause obesity. A team led by researcher Ji-Xin Cheng, assistant professor in the Weldon School of Biomedical Engineering and Department of Chemistry, found that genetically identical cells store widely differing amounts of fat depending on subtle variations in how cells process insulin. In this image, insulin (green) is present in cells with no fat storage and absent in cells with fat storage at two days after insulin addition. This observation indicates faster insulin processing rates in cells with fat storage. Fluorophore-labeled insulin (green) is visualized with fluorescence imaging, and fat is visualized with coherent anti-Stokes Raman scattering—or CARS—imaging (red/white).