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THE CIVIL SCOOP

The Department of Civil Engineering
The University of Minnesota Duluth

VOLUME 4, ISSUE 1 OCTOBER 2013

INSIDE THIS ISSUE:

UMD's First Concrete Canoe

After four months of preparation, the concrete canoe named Ice-breaker broke water tension on icy Madison Lake near Mankato, MN last Spring. Pictured from left to right: Mario Gillard, Miranda Anderson, Alex Dickhaus, Peter Demshar.

OUR MISSION

The mission of the Department of Civil Engineering at the University of Minnesota Duluth is to prepare graduates for professional practice and graduate study through a program firmly based in strong technical skills, fundamentals, hands-on learning, sustainability, and professionalism.

A Message from the Department Head

This summer has been a time of change here at University of Minnesota Duluth Civil Engineering. We have a new Department Head, a number of new faculty, and a newly ABET accredited program. Even with all of the change, some things still remain the same. Jill Bergman is still the heart of the office. Mark Roberts is still the go to person in the laboratories. Dr. Carlos Carranza-Torres (Geotech), Dr. Eshan Dave (Transportation Materials), Dr. Nathan Johnson (Environmental), Dr. David Saftner (Geotech), and Dr. Rebecca Teasley (Water Resources) are all still seen in the halls of the building. Sarah Ojard and Brian Kohn both continue with us doing great work in the classroom. Paul Voge, Chris Morris, and Casey Goldberg are also assisting in teaching duties once again.

Let's take a look at the changes. First, the Department Head, Adrian Hanson. I am a native Minnesotan from the southern part of the State (Guckeen, MN). My education is all from upper Midwestern schools; Mankato (Math), UMN Twin Cities (BE Civil), UW Madison (MS), Iowa State (PhD). I am registered Civil, but tend toward environmental, with an interest in small community water and waste water systems.

We have a new structures faculty. Dr. Mary Christiansen comes to us from Michigan Technological University. Her interests are in structural materials, alternative low-CO2 cementitious binders, and concrete made from waste materials. Say hi to Mary. She will be working with Eshan in advising the Student Chapter of ACI. We have another structures faculty coming in January, but that can wait.

Ronny Purba is also with us as an instructor in the area of structures. He recently defended his PhD at University Buffalo, a state university of New York, where his research interest was structural and earthquake engineering. He will be in the classroom teaching structures classes. He will be with us until the end of May.
Dr. Eil Kwon is on sabbatical in Australia until next summer. He will be missed, but he left us in good hands with Dr. Arthur Huang, a visiting assistant professor in transportation. Dr. Huang has come to us from a postdoctoral experience and a PhD at the school in the Twin Cities. Make Dr. Huang feel welcome, he will be with us until the end of next May.

Although Dr. Nathan Johnson is with us this semester, he has a semester off from teaching. He has been so productive in research that it is necessary to give him some time to write. This need was met by bringing Dr. Eleazer Resurreccion to the Department, as a McKnight Postdoctoral Fellow, to work with Dr. Johnson. He will be teaching the Environmental Engineering class, while Dr. Johnson is crunching away doing research and writing journal articles. Dr. Resurreccion earned his PhD at University of Virginia, where his research interest was in algae biofuel, estrogenic endocrine disrupting compounds, wastewater treatment, and energy systems level analysis. Greet him warmly, he will also be with us until the end of May.

The students are really busy both inside and outside the classroom. American Concrete Institute (ACI), American Society of Civil Engineers (ASCE), and Society of Women Engineers (SWE) are all gearing up for another active productive year. I enjoyed being introduced to the cardboard canoe competition at UMD Homecoming as a warm up for the ASCE concrete canoe competition in the Spring. The students are also considering strengthening their involvement in the local student chapter of the Society of Mining Engineering as well as starting an American Railway Engineering and Maintenance-of-Way Association (AREMA) student chapter.

If you have any questions, or need any help, please feel free to come to the CE Office. We will do whatever we can to assist. If you are in Duluth, come visit campus, the CE door and my door is open. If you are so inclined, stick your head in and say hi.

Adrian T. Hanson, Ph.D., PE, BCEE
Department Head and Professor
Department of Civil Engineering

New Faculty

Dr. Adrian Hanson
Department Head and Professor

Dr. Mary Christiansen
Assistant Professor in Structural Engineering

Dr. Arthur Huang
Instructor in Transportation Engineering

Dr. Eleazar (Shane) Resurreccion
Visiting McKnight Post-Doctoral Fellow

Ronny Purba
Instructor in Structural Engineering

ABET Accreditation

Following graduation of our first student with the Bachelor of Science in Civil Engineering (B.S.C.E.) in May 2012, the Department of Civil Engineering applied for ABET accreditation. ABET evaluators visited our department the following September. During their three day visit, the evaluators toured the campus, visited classes and labs, and met with leaders from student groups. They interviewed each of the department's faculty and instructors, University and College leaders, members of the Industrial Advisory Board, and representatives from several departments around campus. After responding to initial comments from the evaluation team, Dean James Riehl, Swenson College of Science and Engineering, received notification in August 2013 that the Civil Engineering Department was accredited retroactively to October 2011. The accreditation became public knowledge in October 2013 when ABET published an updated list of accredited civil engineering programs on its website. The department plans to apply for accreditation again in 2016 when the rest of UMD's engineering programs go through their next accreditation cycle.

Swenson Civil Engineering Building Awards

The Minnesota Construction Association (MCA) presented St. Louis Park, Minn.-based Stahl Construction with a 2013 Award of Excellence for its work as the general contractor on the University of Minnesota Duluth's James I. Swenson Civil Engineering Building. The project won MCA's 2013 Award of Excellence in the green/sustainable construction category. The honor was conferred Jan. 23 at the 2013 MCA Awards of Excellence Gala at the Minneapolis Golf Club. Conferred annually, the MCA Awards of Excellence recognize construction projects and association members that make substantial contributions to the construction community.

The James I. Swenson Civil Engineering Building was a 2012 Evergreen Awards New Construction Winner, and was listed in the AIA COTE Top Ten Green Project Awards. The Evergreen Awards, presented by ECOSTRUCTURE magazine, recognized outstanding design and environmental performance in the commercial building realm. The AIA COTE Top Ten Green Project Awards are awarded annually by the AIA's Committee on the Environment (COTE) and recognize ecological design thinking.

Students Attend the 61st Annual Minnesota Geotechnical Engineering Conference in St. Paul

Students and faculty at the Geotechnical conference at University of Minnesota Twin Cities. From left to right: Andy Aarons; John Allen (a practicing geotechnical engineer and spouse of Professor Rebecca Teasley); Peter Demshar; Brian Field; Professor David Saftner; Carlos Carranza-Torres; Neil Ramdhan; Dan Kraft; Andrew Lund; Emily Erdahl; Justin Staker; Brett Carlson; David Polson; and Tyler Reich.

On February 22, Civil Engineering students attended the (one-day) 61st Annual Geotechnical Engineering Conference at the University of Minnesota, Saint Paul Campus. These series of annual geotechnical conferences were started in 1953 and are among the oldest on-going annual conferences organized by the University of Minnesota. The Annual Geotechnical Engineering Conference attracts professionals working in the geotechnical engineering field in Minnesota and bordering states.

This year's speakers included (in the order listed in the program): Prof. C. Dowding from Northwestern University, Illinois; Prof. C. Carranza-Torres from University of Minnesota Duluth; Prof. T. Wu from Ohio State University, Columbus; Prof. P. Mayne from Georgia Institute of Technology, Atlanta; Dr. R. Bonaparte from Geosyntec Consultants, Atlanta; Dr. J. Nicks from Federal Highway Administration, Virginia; Mr. B. Theroux from Short Elliott Hendrickson Inc., St. Paul; Mr. N. Lichty from Gale-Tec Engineering Inc., Wayzata, Minnesota; Mr. D. Mattison from Minnesota Department of Transportation, Maplewood; Mr. B.C. Vargas from SolData Inc., Seattle, Washington; Mr. A. Shinnefield from Braun Intertec, Minneapolis; and Mr. B. Odgers from TenCate Geosynthetics, Olathe, Kansas.

After the conference, students and faculty enjoyed a happy hour together at 'Granite City' in the Rosedale Mall, near the conference place. If you are interested in attending the next Minnesota Geotechnical Engineering Conference (which will take place in late Februrary of 2014) keep an eye open for advertisements to be made in early February, or contact Professors David Saftner or Carlos Carranza-Torres. We look forward to your participation in future attendances to the annual conference!

Scholarships/Awards

The generosity of alumni, friends and industry partners make it possible for the Swenson College of Science and Engineering to present scholarships to engineering students at UMD. This year's engineering scholarship recipients will be recognized at a banquet on October 21st at the Duluth Entertainment Convention Center. Congratulations to the following Civil Engineering students on their scholarships!

44th Engineer Battalion Memorial Scholarship	Richard Thomas
Barr Engineering Co.	Curtis Cammack and Peter Demshar
BendTec, Inc.	Mitchell Nelson
Oscar J. Boldt Company Builders Scholarship	Nathan Nohner
	Edward Welch, Aaron Anderson, Robert Learmont, Alison Berreth
Cliffs Foundation	Randy Paul
Krech Ojard and Associates	Neal Smith
LHB	Darren Preiner
Roy LaBounty Scholarship	Kyle Moberg
Lake Superior Consulting	Evan Zik
Minnesota Power Foundation	April Boehne
Noramco Engineering Corp.	Nevala Plaseman
Mary Ann and Jerry Ostroski Engineering Scholarship	
Jill and Terry Swor Scholarship	Miranda Anderson
TKDA & Associates Inc	Edward Taylor
Ulland Brothers Inc.	Gage Morgan
	Jake Lee

The Department of Civil Engineering extends sincere thanks to the following alumni, faculty, friends and organizations who supported our students and programs with a charitable gift. Listed below are the names of those who donated to Civil Engineering Department funds between January 1, 2012 and May 31, 2013. Thank you for your generous contributions!

Barr Engineering Co.	Lake Superior Consulting
BendTec Inc.	LHB Inc.
Oscar J. Boldt Company	Minnesota Assn. of Asphalt Paving Tech.
John H. Carlson	Minnesota Power Foundation
Carlos M. Carranza-Torres	Noramco Engineering Corp.
Cliffs Natural Resources	SRK Consulting
Kathleen S. Croke	Terry Swor
Raymond L. Erickson	TKDA & Associates Inc.
Gary Finley	Ulland Brothers, Inc.
Krech Ojard & Associates	Robert J. Wahlstrom

Scholarships/Awards (continued)

Pictured to the right: Ms. Chelsea Hanson (BS, MS) presented with the best poster award by AAPT Young member Committee Chair Dr. Andrew Braham.

The 88th Annual meeting of the Association of Asphalt Paving Technologists during April 2013 in Denver, CO included a student poster presentation session. There were 33 poster abstracts submitted for this session and 15 were chosen to be presented. The posters were available throughout the conference and a panel of judges evaluated the posters and presenters during this period. Based on the scores from judging, Ms. Chelsea Hanson (graduate student in Civil Engineering at the time) won the best poster award. Ms. Hanson finished her M.S. during summer of 2013 and is presently in Germany as part of joint US-German Government fellowship program.

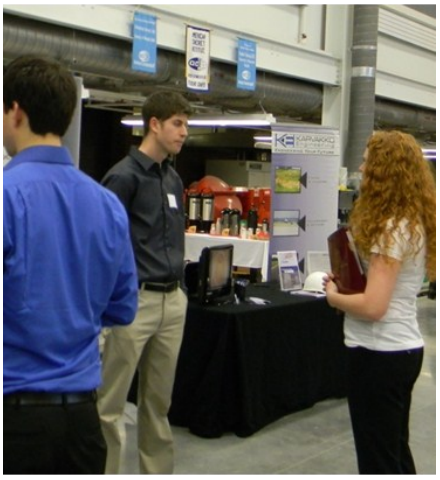
Pictured to the left: Two UMD Civil Engineering students received scholarships at the 46th Annual Engineering Excellence Awards Banquet sponsored by the American Council of Engineering Companies (ACEC) on January 25, 2013. Travis Jensen (middle) received the Don Stormoe Scholarship and Jared Olson (fourth from the left) received the Braun Intertec Golf Scholarship.

Building Endowments

I, Adrian Hanson, would like to take this opportunity to thank all of the friends of the Department who have provided scholarship support for our students over the years. We are a young department and appreciate the support for our students. Thank you. One of the easiest ways to support Civil Engineering students at the University of Minnesota Duluth is to provide student scholarships. Most of our student scholarships today are short term, 'annually-funded' scholarships. This means that an individual or organization donates funds each year to award a scholarship to a deserving student for the upcoming academic year. In this scenario, the annually funded scholarship monies are depleted each time a scholarship is awarded. While the awarded student sees an immediate benefit, there is no long term investment in student support. Each annually funded scholarship provides a minimum of $1000 per year per student.While these scholarships are beneficial to our students, endowment giving is a more sustainable scholarship model, providing long-term support and funding far into the future. An endowment scholarship can be established with as little at $25,000 and pledged over as much as 5 years. I understand this level of giving may be beyond a reasonable reach for some. You may wish to consider another option - placing a portion of your scholarship donation toward building an endowment and using the other portion to support a student today with an annually funded scholarship. Over time, your endowment fund will grow to a level that continuously supports students far into the future without further investment in the fund. A split donation has an immediate short term impact and also provides an investment in sustainable scholarship giving. To discuss endowing a new scholarship for Civil Engineering students or to make a gift to any of the funds supporting the program at UMD, please contact Carrie Sutherland, SCSE Development Director, at 218-726-6984 or csutherl@d.umn.edu. Or you can make a direct gift online at http://www.d.umn.edu/development/SCSE.html

Department News

Third Annual Civil Engineering Career Fair to be held February 7, 2014



UMD Civil Engineering graduate Spencer Newman tells current students about his experiences at Larson Engineering

Current students had a chance to talk to UMD graduate Gary Doup about working at MnDOT

Current students talked about working at LHB with UMD graduate Matt Fournier

The 2nd annual Civil Engineering career fair was held in the High Bay Lab last winter. It gave students a chance to meet company representatives and pursue employment opportunities. Seventeen companies registered, and over one hundred students participated in this event.

The 3rd annual career fair will be held February 7, 2014 from 8:30-1:00 in the Civil Engineering High Bay Lab. Registration forms and additional information are available on our website, d.umn.edu/civileng/.

Organizations are invited to present at the company overview session on February 6, 2014 from 5:00-7:00. Each company will have 10 minutes to share information about their organization.

Information will be sent out in the coming weeks. If you have any questions, please send an email to our department executive administrative specialist, Jill Bergman at jbergma1@d.umn.edu

New Water Policy Course

Last year assistant professor Rebecca Teasley joined the faculty of the multidisciplinary Water Resources Sciences (WRS) program, a joint program between the University of Minnesota Twin Cities campus and UMD. Through this program, she is teaching a new graduate level course in Water Policy on the UMD campus. The course is required for the WRS curriculum and this is the first time a professor based on the UMD campus is teaching the course. This course touches on many aspects of water policy including socio-cultural, legal, and economic factors that affect water resources management. The course is cross-listed with a Civil Engineering graduate class which enables the Civil Engineering students to gain familiarity with other science perspectives on water management through interaction on assignments and discussions with the students in the WRS program.

Environmental Lab

Renovations to a laboratory space which will house both teaching and research activities for Environmental Engineering in the department was completed in June 2013. The teaching space is set up as a wet-chemistry lab and has room for up to 23 students per lab section. In addition to stations for up to 9 groups to work on water quality measurements, a demonstration area and teaching space allows for introductions to course material. A laboratory section, added to CE 3025 Environmental Engineering in Spring 2014, will introduce junior-level students to the techniques used to quantify basic water quality concepts and parameters including reactor and reaction kinetics, turbidity, conductivity, pH, and oxygen demand. Hands-on demonstration and in-depth lab activities covering these topics will help to reinforce material covered in the course and give students experience with many common measurements used to quantify and manage water quality. A senior / graduate level Environmental technical elective is in the planning stages and will introduce students to more advanced water quality concepts and lab techniques in the context of a local industrial and water treatment stream.

The teaching space currently houses two fume hoods, a Millipore water purification system, a flame Atomic Absorption unit capable of quantifying metals in water samples, and several refrigerators for sample storage. Additional equipment including pH and DO meters, balances, incubators, pipettes, pumps, ovens, and various other filtration and glassware is being purchased to support laboratory teaching activities.

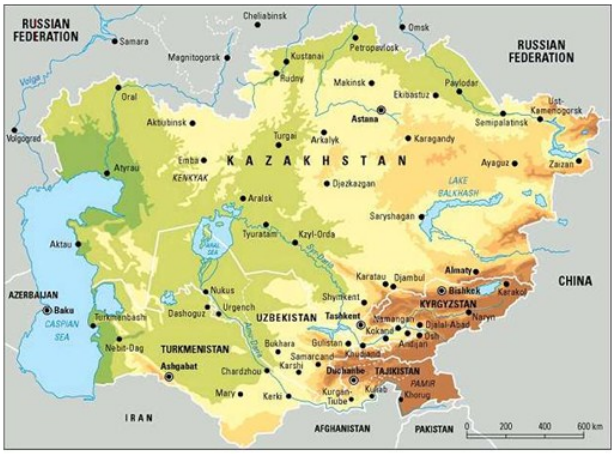
The research space has been outfitted with fume hoods, an oxygen-free glove box to process and store sensitive environmental samples, centrifuges, filtration equipment, a spectrophotometer, and a variety of electrochemical and field sampling equipment. A major addition to the lab this summer was a flow-through system capable of supporting 140 simultaneous biological tests on sediment samples.

Research News

Research on the Use of Dredge Material from Erie Pier

Graduate student Andrew Lund's MS project focuses on use of dredge material from Erie Pier. The project came from meetings between representatives from the City of Duluth, the Duluth Economic Development Authority (DEDA), and UMD faculty. The coarse material dredged from the harbor is used in transportation applications, leaving fine material stored at Erie Pier. Because the remaining fine material is more compressible and has less desirable drainage characteristics, there are engineering challenges in using this soil. Andrew has researched methods of improving fine dredge material and characterized the Erie Pier soil. He is currently testing methods of improving the fine dredge soil in order to increase its usefulness in engineering applications.

Water Resources Research Update



The transboundary Syr Darya basin in Central Asia flows through Kyrgyzstan, Tajikistan, Uzbekistan, and Kazakhstan before flowing into the Aral Sea. The four riparian countries are negotiating a water and power sharing treaty.

Assistant Professor Rebecca Teasley has been continuing to develop research in the area of Water Resources Engineering. Graduate student, Kyrstyn Haapala, has been working with Dr. Teasley in a joint project with NRRI and others to examine the feasibility of using a technology called compressed air storage for energy production in Minnesota. Kyrstyn and Dr. Teasley are assessing the potential environmental impacts that might occur through implementation of this project, including groundwater changes.

Dr. Teasley is continuing her research in the area of cooperative game theory in transboundary river basins with colleagues from The University of Texas at Austin and UC Davis. In a paper published late last year, she examined the use of using cooperative game theory to quantify the benefits of a new treaty among the four riparian countries in the Syr Darya basin in Central Asia. This work has been extended to consider future uncertainty and its affect on the outcomes of treaty negotiation in the Syr Darya basin.

Research With UROP Students Published

The article entitled "On the elastic analysis of a circular lined tunnel considering the delayed installation of the support" authored by Prof. Carlos Carranza-Torres and former UROP (Undergraduate Research Opportunities Program) students Brock Rysdahl and Muhammad Kasim was published in the July 2013 edition of the prestigious International Journal of Rock Mechanics and Mining Sciences (http://www.sciencedirect.com/science/article/pii/S1365160913000269).

The paper, which includes 26 figures and 245 equations, presents an analytical solution based on the Fourier series method to the fundamental problem of excavating a circular tunnel with support in a ground subjected to non-uniform far-field stresses. The solution, which assumes the ground and support to be linearly elastic, considers that the liner is installed after a specified stress relaxation of the ground has taken place due to the advance of the tunnel front behind the supported section.

The derivation of the solution presented in the recently published paper follows the mathematical approach proposed in an article authored by Einstein and Schwartz, published in the Journal of the Geotechnical Division of the ASCE (American Society of Civil Engineers) in 1979. The original solution by Einstein and Schwartz (which was the result of Schwartz's PhD work at the department of civil engineering at MIT, under the supervision of Prof. Herbert Einstein) did not account for the 'delayed' effect of installation of the support, as the solution derived with UROP students does.

The new fundamental solution is expected to become a valuable theoretical tool for tunnel engineers interested in determining the loads and deformations in tunnel supports as well as for education professionals teaching students the basis of design of tunnels in the framework of the rigorous mathematical theory of elasticity.

Pavement Research Update

Mr. Robert Kostick (L, graduate student) and Mr. Jared Munch (R, undergraduate student) conduct in-situ permeability tests on Trunk Highway 53 bridge wear course in Virginia, MN.

This year has been quite busy for the research group of Dr. Eshan Dave with wide variety of research projects on pavement materials and rehabilitations. The projects spanned across laboratory testing, field evaluation, and computer simulations. Over the course of this year, Dr. Dave's research group has been involved with: (1) Evaluation of rapid setting concrete patching mixes; (2) Development and implementation of performance test based specifications for asphalt concrete; (3) Fracture mechanics based design of asphalt overlays; and (4) In-situ evaluation of bridge deck wear courses. Dr. Dave and his students will begin research on two new topics this fall and spring, namely: (1) Performance evaluation of coarse asphalt mixes and (2) Field evaluation of asphalt patching techniques and development of best practices manual. Both of these studies are being sponsored by Minnesota Department of Transportation.

Two group members recently completed their M.S., their thesis titles are as follows:

"Effects of Mix Design Parameters on Indirect Tensile Strength and Field Cracking Performance of Asphalt Pavements" by Ms. Chelsea Hanson

"Enhanced Performance Criteria for Acceptance of Rigid Pavement Patching Materials Used in Cold Climate Regions" by Mr. Jay Dailey

Student Organization News

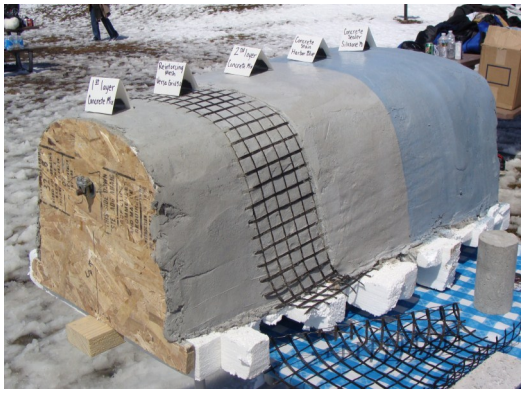
UMD SME student chapter tour to Essar Steel mine in Nashwauk, Fall 2012

The Society of Mining, Metallurgy, and Exploration (SME) student group has been planning activities for this school year. Proposed activities include two mining visits per semester, as well as an industry speaker at each meeting. Last year, the club had various speakers, as well as tours to Hibbing Taconite and Essar Steel mines. This year there will be even more exciting activities coming up.

Civil engineering students shall find it interesting to participate in this group. For students interested in geotechnical issues, there is excavation, tunneling, and slope stabilization in mining. For those interested in environmental issues, there is pollution control both for air and for water. For those interested in water resources issues, there is dewatering, channeling water, and building dams in tailings basins. For those interested in structural issues, there are many concrete and steel buildings that are used to support the equipment and machinery related to processing of mined materials. For those interested in transportation issues, mines require a network of haul roads, as well as good highways and railroads to move the materials produced in mines.

Mining is alive and well, and constantly developing in Minnesota, and the SME is a great club for developing interests, skills, networking, and getting a leg up within the Minnesota mining industry and industries related to mining. Keep on watching around the Swenson Civil Engineering building for future meeting notices! In the mean time, feel free to contact civil engineering student Robert Learmont (learm011@umn.edu) for questions.

ASCE



Pictured above: The five canoe layers (L-R) first concrete mix layer, reinforcing mesh (versa grid 3.0), second concrete mix layer, concrete stain (harbor blue), concrete sealer (siloxane PD)

Pictured below: UMD's competition display board

Pictured above: UMD's canoe "Icebreaker" ready to hit the water on a frigid April 20th

The UMD competition team after their race

Last April, Icebreaker broke water tension on icy Madison Lake near Mankato, MN. This was 4 months after the first ever concrete canoe meeting held at UMD. UMD beat the U Twin Cities in every race and took 2nd and 3rd in two of the races. It was a great success for everybody involved, and it impressed everybody who watched.

Although we had success in our goal of competing, we left plenty of room for improvement in the overall competition. The simplest fix will be the paper. This year we will know what the judges look for in a good paper. Once on the water, we discovered our paddling abilities were in need of work. We hope to improve this by having several team practices this fall. There is a plan to do extensive research to come up with a concrete mix design that is lighter than water. This is one of the goals we did not meet with last year's canoe. We placed well in the presentation kept the audience interested in how we made it to the competition. Finally, we learned a lot about how not to finish the concrete when casting the canoe, and plan to have a much smoother finish and more appealing detail on the upcoming model. These improvements should sail us toward the top of the competition.

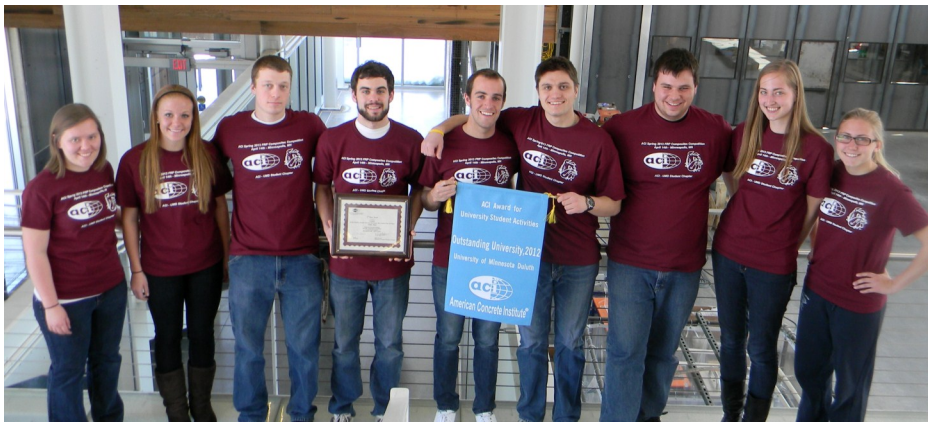
On the upcoming canoe we have time and experience on our side that we did not have last year. This will allow us to spread out the work over a longer period and permit enhanced craftsmanship. in April 2014, we hope to expand the impressions we have already made.

ACI Student Competition

Six Civil Engineering students attended the American Concrete Institute (ACI) convention on April 13-15, 2013, in Minneapolis to compete in the student FRP Composites Competition. The goal was to design, construct, and test a concrete structure reinforced with fiber-reinforced polymer reinforcement to achieve the largest load-to-cost ratio. Thirty teams from across the Americas competed in two categories, Load-to-Cost and Predictions. UMD Team 1 placed 2nd and UMD Team 2 placed 4th in the load-to-cost category. The UMD ACI Student Chapter would like to thank all of the organizations that helped out with the competition and travel costs.

The sponsors were: **Twin Ports Testing, Van Sickle, Allen & Associates, American Engineering Testing, Concrete Paving Association of Minnesota, Krech Ojard & Associates, Mortenson Construction, and Arrowhead Concrete.**

The UMD ACI Student Chapter will be competing in the ACI Pervious Concrete Cylinder Competition in Phoenix, AZ this October and the ACI FRC Bowling Ball Competition in Reno, NV in March. If you are interested in sponsoring or participating in future competitions, please contact ACI Student Chapter President Denis Mikulic at mikul044@d.umn.edu.



From L-R: Kyrstyn Haapala, Chelsea Hoplin, Matt Jansen, Ben Cammack, Rob Kostick, Denis Mikulic, Ray Stockinger, Miranda Anderson, Heidi Olson

Freshly poured competition beams

SWE

The Society of Women Engineers (SWE) club at UMD has increased in size tremendously over the past few years. The club was founded at UMD in September of 2010 as an interest group and became recognized as an official student chapter by SWE National in September 2012.

Their main focus is building friendships among other women and supporters of women in engineering. They have events such as outreach to the community by volunteering and visiting youth in schools, as well as learning about other engineers in the field by inviting them to speak at meetings, going on tours, and attending networking events and career fairs.

The group is planning on attending both the National Conference in October and the Regional Conference in February. Both of these events are sure to be valuable experiences for all who attend.

So who can join SWE? Anyone who is an advocate of women in engineering; men or women, engineering student or not. Please contact the chapter president, Meredith Olson at olso5591@d.umn.edu or come to a meeting if you'd like to join.

Pledge Card

Pledge amount $_____

_____ Check if you are interested in a named option (named labs or logo display)

Donor Name(s) _____

Address_____

City _____ST _____ Zip _____

(For named giving options, Carrie Sutherland will contact you for plaque and/or logo information)

A donation to the CE program in any amount is greatly appreciated — our hands-on type of program requires a significant amount of equipment to properly train students.

Named giving options are available as well. Please contact Carrie Sutherland with any questions (address at the bottom of this form).

Payment Options:

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Name on Credit Card _____

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I would like to be reminded of my pledge ____ quarterly

____ semi-annually or ____ annually.

____ Securities (Please contact me with information about making my gift with securities).

Signature _____ Date _____

Please return completed form to:
Carrie Sutherland
Development Officer
102 Engineering Building, 1303 Ordean Court
Duluth, MN 55812
218-726-6984 or csutherl@d.umn.edu

Named Giving Options:

High Bay Lab **$300,000**

Structures Lab **$300,000**

Construction Material Lab **$100,000**

Soil and Rock Lab **$75,000**

Classroom (1 remaining) **$50,000**

Computer Lab **$10,000**

Model Shop **$10,000**

Conference Room **$10,000**

Logo Display in Hallway (large company logo in hallway between Engineering Building and Civil Engineering) **$5,000**

Department of Civil Engineering
University of Minnesota Duluth
221 Swenson Civil Engineering Building
1405 University Drive
Duluth, MN 55812

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Department of Civil Engineering
University of Minnesota Duluth
221 Swenson Civil Engineering Building
1405 University Drive
Duluth, MN 55812
Phone: 218-726 6444
Email: civileng@d.umn.edu
Web: www.d.umn.edu/civileng/