From the Director

Dear Colleagues and Friends,

Greetings from HOT summer days in North Texas! I would like to take this opportunity to thank our board members, project sponsors and associate faculty. This newsletter brings you exciting news on recent CUIRE activities, such outreach activities, research projects, and publications.

These newsletters just highlight a few of our activities, for more information; please do not hesitate to contact us at 817-272-9177 or cuire@uta.edu with any questions or comments.

Warm Regards,

Mohammad Najafi
CUIRE Director
najafi@uta.edu

2011 CUIRE Board Members
The CUIRE Board is the backbone of our organization, and we would like to recognize them for all their support and dedication.

Sam Arnaout
Ralph Carpenter
Robert Carpenter
George Davis
Mark Dionise
Chad Kopecki
Dan Liotti
Jim Marlen
John Morgan
Mohammad Najafi
Mario Perez
Lynn Osborn
Camille Rubeiz
Jim Rush
Rich Mielke
Lawrence Slavin
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Hanson Pipe and Precast
AMERICAN Ductile Iron
Underground Construction
Missouri DOT
Michigan DOT
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Midwest Mole, Inc.
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For More Information Regarding CUIRE: www.cuire.org
CUIRE hosts Successful Certification Schools

During Underground Construction Technology (UCT) 2011 held in Houston, TX, CUIRE offered four Engineering and Inspector Certification Schools. On January 23 and 24, 2011, the following two-day Schools were held:

- Advanced Horizontal Directional Drilling (HDD)
- Trenchless Technology New Construction Methods
- Trenchless Technology Pipe Lining, Renewal and Replacement
- Pipeline Design and Construction Using Open-cut Method

Each school was taught by several CUIRE board members, associate faculty members, each bringing their area of expertise to share with the attendees. Participants attending the Schools had various backgrounds and experience, which made for a great learning atmosphere.

In Conjunction with UCT 2012, on Sunday & Monday, January 22-23, 2012, in San Antonio, Texas, CUIRE plans to offer its 9th Annual Engineering and Inspector Training and Certification Schools, as follow:

- Mud School for Trenchless Technology Methods (includes properties, mixing, and pumping for successful operations)
- Pipe School (includes construction, properties, manufacturing, jointing, repair and tapping, and benefits and limitations of each pipe material used in transmission and distribution of water, wastewater, gas and oil)
- Geotechnical School (includes Surface and Subsurface Investigation Requirements for Trenchless and Open-cut Methods)
- Advanced HDD School (includes planning, design, and construction methods)
- Pipe Lining and Replacement School (includes trenchless renewal and pipe bursting/removal methods)
- Pipe Jacking and Microtunneling School (includes bore and jack, box culvert, ramming methods)

The fee for each daily School will be $495, with registration for two Schools at $795. Special discount will be offered for early registration and 2 or more people registering from same organization. For more information call CUIRE at 817-272-9177 or Email: cuire@uta.edu

CUIRE hosts ASCE Sustainable Design of Pipelines Committee Meeting

CUIRE hosted first ASCE Sustainable Design of Pipelines task committee meeting on May 16—17, 2011 at the Engineering Research Building (ERB) complex on UT Arlington Campus. More than 20 members of the task force attended this meeting. During this meeting, the task committee was divided into several subcommittees and charged with preparation of each section of a white paper on Sustainable Design of Pipelines. For more information on the white paper, contact task committee chair, Walt Schwarz, P.E., CH2M HILL 954 425-1229 or Walt.Schwarz@CH2M.com or Chair of ASCE Pipeline Location and Installation (PLI) Committee, Dr. Sri Rajah at 425-450-6269 or sri.rajah@hdrinc.com.

CUIRE will be happy to provide its facilities for similar meetings to industry and associations free of charge. For more information call CUIRE at 817-272-9177 or Email: cuire@uta.edu
Dr. Mohammad Najafi, Director of the CUIRE and the Construction Engineering and Management, started 2011 with a busy schedule with making several keynote and invited presentations. The first international conference was INFRAASSETS 2011, the World Congress and Exhibition Infrastructure Asset Management, held February 22-24, at Putra World Trade Centre, in Kuala Lumpur, Malaysia. More than 500 people attended this unique event with several presentations by Malaysian prime minister and other government officials. Dr. Najafi made a keynote presentation on the topic of "Evaluation of GASB-34: Application for Municipal Water Infrastructure Asset," and participated in a panel discussion on key challenges facing the infrastructure asset management profession and practice, and views on the future. Additionally, he chaired a session on "Infrastructure Asset Management for Power Industries, Utilities, and Innovative Approaches to Decision Making requirements."

The second international conference Dr. Najafi attended was on Utility Management and Safety (ICUMAS), held March 6-9, 2011, in Honk Kong, China. The ICUMAS was jointly organized by the Hong Kong Utility Research Centre (HKURC) and co-organized by the Faculty of Engineering, the University of Hong Kong, Faculty of Engineering, the Chinese University of Hong Kong, Faculty of Construction and Land Use, Department of Land Surveying and Geo-Informatics, the Hong Kong Polytechnic University, and other local organizations. The topic of his keynote presentation was "Applicability of Internally Restrained PVC Pipe Joint for Horizontal Directional Drilling (HDD) Practice."

The third international conference Dr. Najafi presented was the 2nd Annual Underground Infrastructure and Deep Foundations, organized by International Quality & Productivity Centre (IQPC), held on May 30—June 2, 2011, in Doha, Qatar. The topic of his keynote presentation, on May 31st, was "Designing, Rehabilitating and Maintaining Water and Sewer Networks." Additionally, on May 30th, he presented a ½ day pre-workshop on "Overview and Benefits of Trenchless Technologies for Construction and Renewal of Pipelines and Utilities for Municipal Water, Sewer, Gas, and Conduit Applications," and served as a panel discussion presenter afterwards. In addition to above conferences, Dr. Najafi was invited speaker for the ASCE Forth Worth Branch monthly meeting on December 13, 2010, on the topic of "Recent Developments in Underground Infrastructure Teaching, Research and Outreach Activities," and on February 16, 2011, invited presenter for the Texas Society of Professional Engineers (TSPE) on the topic of "Overview and Comparisons of Trenchless Technologies." Also on April 13th, Dr. Najafi was the invited speaker for the American Public Works Association (APWA) Texas Chapter, North Central Branch who made a presentation on trenchless technologies.
CUIRE Receives TxDOT Research Grant

CUIRE received a one-year research and implementation grant from the Texas Department of Transportation (TxDOT) for project entitled “Validation of Culvert Standard SCP-MD and Jack and Bore Issues.” The scope of this unique project is to conduct a method evaluation for the installation of a multiple culvert drainage system (box or pipe). This would allow for the preparation of new or revised TxDOT specifications and standard plan details that corresponds to the utilization of the jack and bore trenchless construction method described in the current TxDOT specifications standard book. The current TxDOT specifications allow only for jack and bore while other trenchless construction methods (TCMs) like horizontal auger boring (HAB), horizontal directional drilling (HDD), and pipe ramming (PR) are currently in use. Dr. Najafi is the principal investigator of this important research program. currently in use. Dr. Najafi is the principal investigator of this important research program.

For More Information Regarding CUIRE: www.cuire.org

CUIRE Receives a Second Phase to Existing Research Grant from Tarrant Regional Water District (TRWD)

CUIRE is providing TRWD with the testing and the research services for the Integrated Pipeline (IPL) Project. The first phase of this important research contract was awarded in May 2010, and the second phase was awarded on January 2011, which includes:

1. Perform physical testing and determination of modified soil/pipe interactions to test the most viable systems.
2. Develop a finite element analysis of pipe/modified soil Interaction for each potential pipe type/backfill to determine feasibility of the system using a single live load/dead load scenario.

CUIRE is fortunate to be involved in this unique and challenging project and looks forward to work closely with TRWD and other project participants. For more information, contact Dr. Najafi at najafi@uta.edu.
CUIRE Receives a Third Phase to a 3M Research Grant

With U.S. water infrastructure expenditures expected to reach billions of dollars annually, 3M in cooperation with CUIRE, is developing a new water pipe renewal product. The first phase of this research contract was awarded in March 2009, the second phase was announced on July 31, 2009, and a third phase was awarded on January 2011. The cooperation between 3M and CUIRE includes development of design and construction guidelines, specifications, short term and long term testing, finite element analysis, and field evaluations for the new spray-on structural enhancement product in final stages of development. CUIRE is also developing an ASCE Manual of Practice on “Methods of Renewal for Potable Water Pipes” and an ASTM Standard on “Renewal of Existing Potable Water Pipes by Spray in Place Pipe – Advanced Polymer Coatings.”

CUIRE Completes Testing and Analysis of Bar-Wrapped Pipe Joint

CUIRE and Northwest Pipe Company (NWP) joined forces to complete testing, finite element analysis and characterization of a new improved joint design for bar-wrapped concrete cylinder pipe. The principal investigators (Dr. Ramirez and Dr. Najafi) provided testing support services to NWP to evaluate this innovative pipe joint. The testing program provided quantifiable data that can be used for product classification and/or qualification requirements. A description of methods and instrumentation is provided in the report developed by CUIRE. It also includes the instrumentation details. This testing and evaluation program was conducted from August 2009 through December 2010, and a final report was submitted in early 2011.

Dr. Najafi Joins UCTA as a Faculty Advisor

Last January, Dr. Mohammad Najafi on behalf of CUIRE, was invited to the Board of Underground Construction Technology Association (UCTA) – North Texas Chapter, to serve as faculty advisor. UCTA holds regular luncheon meetings in Dallas Fort Worth Metroplex with 60 to 100 industry and government people attending each meeting. For more information on UCTA and its activities, visit http://www.uctaonline.org/. CUIRE appreciate its association with UCTA, as brings more support to CUIRE activities and its student scholarship program.
The main objective for the North American Society for Trenchless Technology (NASTT) student chapter at UT Arlington is to educate and train the graduate & undergraduate students in the field of Underground Construction & Trenchless Technology. In the last academic year, the club has participated in the ASCE Pipelines 2010, Keystone, Co, UCT 2011, Houston, TX, and a trip to the No-Dig 2011 show in Washington, DC. At regular meetings, presenters such as Chad Kopecki and Ben Stevenson of Dallas Water Utilities have spoken to the student group.

The main objective for Texas Society of Professional Engineers (TSPE) student chapter at UT Arlington is to promote professional interests in all disciplines of engineering by developing professional contacts, providing leadership opportunities and encouraging the pursuit of professional goals. Dr. Mohammad Najafi of CUIRE/UT Arlington was first speaker to kickoff TSPE activities last spring.

Students Attend ASCE Pipelines 2010, UCT 2011 and NASTT No-Dig Show 2011

Five students from UT Arlington attended ASCE Pipelines 2010 held in Keystone, Co on August 28—September 1, 2010. Dr. Najafi, CUIRE Director and four graduate students presented two papers on new pipe lining methods using polyurea spray-on and applicability of restrained joint PVC pipe in HDD. Also, 20 Students from UT Arlington attended UCT 2011 held in Houston, TX. CUIRE thanks UCT for providing the opportunity for students to gain knowledge of underground construction technologies. In this conference also, three graduate students along with Dr. Najafi presented two papers on the research conducted in CUIRE.

Additionally, six students from UT Arlington attended NASTT No-Dig Show 2011 held in Washington, DC on March 27—31, 2011. The students participated in various activities conducted by NASTT Student Chapter. Five graduate students participated in the poster competition and also presented two papers in the conference. During No-Dig Show, One Construction Engineering and Management student received the NASTT’s Michael E. Argent Memorial Scholarship and another student received Rain for Rent Scholarships. CUIRE would like to thank NASTT and Rain for Rent to be recipient of these scholarships.

Student Scholarship News (NASTT & CUIRE)

The North American Society of Trenchless Technology (NASTT) selected one construction engineering graduate student, Trupti Kulkarni to receive the NASTT Michael E. Argent Scholarship with an amount of $5,000. To help students with financial needed, CUIRE awarded 9 each $1,000 scholarships ($9,000) to construction students last year.
Meet the CUIRE Staff

CUIRE has two permanent staff members: a research associate and a program manager. CUIRE is staffed by graduate students that have acquired funding from various projects in infrastructure industry. Please take time to learn about our staff, as their research efforts and dedication are moving the infrastructure industry forward.

Zhen Zheng, MS, EIT; CUIRE Research Associate

Zhen received his MS in structural engineering from Michigan State University in 2010. He has a solid background and extensive experience in finite element analysis (FEA) on research projects, such as from National Science Foundation. Currently, he is working as a faculty research associate at CUIRE. His responsibilities include finite element analysis on several pipeline design and research projects. He can be reached at zzheng@uta.edu and 817-272-9164.

Abhay Jain, MS; CUIRE Program Manager

Abhay Jain is a program manager at the Center for Underground Infrastructure Research and Education (CUIRE) at UT Arlington. He received his Master’s degree in Civil Engineering from the UT Arlington. He was involved in the preparation of the Design and Installation Guide for a new pipeline rehabilitation method for the 3M Corporation. Currently, he handles the administrative and research aspects of several different projects in CUIRE. He can be reached at jain@uta.edu and 817-272-9177.

Jwala Raj Sharma, MS, EIT; Graduate Research Assistant

Jwala Raj Sharma is a Graduate Teaching and Research Assistant and doctoral student at UT Arlington. He graduated with Master of Science in Civil Engineering from UT Arlington and is registered as Engineer-in-Training in the state of Texas. His research works at the University of Texas at Arlington include "Review and development of literature database for HDPE pipe in municipal application," "Development of Cost Estimation Method for Water Treatment Plant," "Applicability of restraint joint PVC pipe in Horizontal Directional Drilling Application," and “Study of Soil-Pipe Interaction for Large Diameter Pipe by Finite Element Method.” He is experienced in presenting class lectures and has presented papers and posters in numerous conferences. He has proven track record in research and technical publications. He can be reached at jwalaraj.sharma@mavs.uta.edu and 469-865-5806.

CUIRE will Co-sponsor International Conference of Pipelines and Trenchless Technology (ICPTT)

October 26—29, 2011, Beijing, China

CUIRE joins efforts with China-U.S. Joint Center for Trenchless R&D (CTRD), American Society of Civil Engineers-Pipeline Division, Geotechnical Engineering Research Center, China Ministry of Education, and China University of Geosciences (Beijing) to sponsor the International Conference on Pipelines and Trenchless Technology 2011 (ICPTT 2011), which to be held on October 26 through 29, 2011, at China National Convention Center, Beijing. With the success of the ICPTT 2009, the organizer expects that ICPTT 2011 will draw more than 500 participans, and more than 1000 to visit the exhibits and equipment show. For more information visit - http://www.icptt.org/
The *ASCE Journal of Pipeline Systems Engineering and Practice*, provides a dynamic forum for the dissemination of research papers as well as case studies and technical notes in all areas of pipeline engineering.

The *Journal of Pipeline Systems Engineering and Practice* provides an authoritative international forum for timely and in depth exchange of ideas and integrated technical solutions, and supports the professional interests of a broad group of researchers and practitioners from academia, industry, and government with new pipeline technologies, planning, engineering, design, construction (conventional and trenchless), renewal, safety, operation and maintenance, asset management, environmental aspects, and sustainability of pipeline systems.

Last June, the number of papers for the ASCE Journal of Pipeline Systems – Engineering and Practice, reached 100, which is a milestone, exceeding all the expectations. The Journal editors will meet at in conjunction with ASCE Pipelines 2011 in Seattle, to decide on several issues, including organization of upcoming Pipeline Research Workshop, to be held in conjunction with Pipelines 2013 in Fort Worth. For more information on the Journal and the Research Workshop, please email cuire@uta.edu or call 817-272-9177.

**UT Arlington in Collaboration with CUIRE Offers a New Master of Engineering in Infrastructure**

The online and in-class Master of Engineering (M.E.) degree in Infrastructure Engineering and Management curriculum focuses on the planning, design, construction, operation and maintenance of lifeline infrastructures which are essential for quality of life. These infrastructures include roads and highways, railroads, airports, and pipelines/tubes for transportation of freight, water, sewer, waste, oil and gas, and information. This broad-based program is specifically delineated for public works and transportation officials, municipalities, government agencies, utility and pipeline owners, design and consulting engineers and professionals involved in operation & maintenance and asset management of pipelines and utilities, railroads, roads and bridges, airports, pavements, water and wastewater treatment plants, hydraulic structures, and culverts and drainage structures. The Infrastructure Engineering and Management includes service life estimation, asset management, life cycle cost analysis, deterioration theories, inspection and assessment methods, and renewal and maintenance of infrastructure with utilization of innovative methods, sustainability considerations, environmental protection, and trenchless technologies. Each student's program of study is customized towards interest of the student and must be developed with the supervising committee before completing twelve (12) graduate credit hours. Core and sample elective course requirements for a master’s degree in the infrastructure engineering area are described below.

**Master of Engineering Degree:** Twenty-four (24) hours of course work must be in Civil Engineering.

**Core Courses:** Twelve (12) semester hours are required from the Core Courses list.

**Elective Courses:** Twenty one (21) semester hours of elective course work must be taken from Civil Engineering Elective Courses listed below (i.e., one (1) three (3) hour course from each of the following CE areas - environmental, geotechnical, structures, transportation, and water resources). Three (3) additional semester hours of electives must be taken from the department or selected courses outside the department. Three (3) semester hours of elective course work must be taken as a research tool or supporting courses to the program of work, such as the CIRP courses listed under Elective Courses below. The Elective Courses listed below are highly recommended for this option, but are not all-inclusive. Course selection must result in a cohesive program that supports the degree plan and must receive the approval of the student’s supervising committee.

**Project Course:** Each student must complete a three (3) hour project on Infrastructure Design Engineering (CE5395 Master Project).

**Final Exam:** Enrollment in CE 5193, Master’s Comprehensive Examination is required in the semester of graduation.

For more information please visit [http://www.uta.edu/ce/infrastructures.php](http://www.uta.edu/ce/infrastructures.php)