

## VOLUME 10, NO. 2 JULY 2017 2017 CUIRE Board Members

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CENTER FOR UNDERGROUND INFRASTRUCTURE RESEARCH AND EDUCATION

#### **FROM THE DIRECTOR:**

The semester at UT Arlington has come to an end and some graduate students working for the Center are leaving soon for their summer internships. Congratulations to our recent graduates, Ameya Paradka,r who completed his Ph.D. dissertation on evaluation of a new PVC pipe, and Hamed Hashempour and Rasoul Adnan Abbas, who completed their Master's thesis on tunneling productivity and smart cities respectively. We wish him the best of luck in their future endeavors!

In February, CUIRE held another successful Engineering and InspectorTraining for Trenchless Technologies in conjunction with Underground ConstructionTechnology (UCT) Conference and Exhibition held in Fort Worth, Texas. More than 45 professionals attended these specialty schools and graduated with certificates of completion. Our next schools will be held in conjunction with UCT in January/February 2018 in New Orleans.

We are happy to announce the largest number of students attending UCT in Fort Worth, as well as No-Dig 2017, held in April in Washington, D.C., with 40 and 35 attending each event! During No-Dig show, Nilay Patel, NASTT' Student Chapter President at UT Arlington, received an award for his presentation on student activities at UT Arlington.



This summer, CUIRE is offering its 11th annual pipeline and trenchless technology class for graduate and senior civil engineering students. More than 45 students have registered for this class, which will be offered both in-class and online.

online. This is a special issue of Currently@CUIRE to celebrate with 25th anniversary of *Trenchless Technology*. The first issue of magazine was published in July 1992, and CUIRE was established 10 years later, in July 2002, with many accomplishments and contribution to celebrate in research projects (laboratory and field testing, development of guidelines and specifications, feasibility

studies for major underground transportation projects, etc.), and educational and outreach activities. Looking forward, CUIRE is in a unique position as the only industry/government/ university center with focus in the whole underground infrastructure spectrum which opens numerous opportunities and exciting potentials for growth.As always, I cannot thank our funding agencies, both public and private, and board members enough for their continuous support and contributions to the CUIRE.

Have a wonderful summer, Mohammad Najafi, Ph.D., P.E., F.ASCE Professor and CUIRE Director

# CUIRE GRADUATE ASSISTANTS VISIT REINFORCEMENT OF CONCRETE BOX CULVERTS WITH FRP

On June 7, several CUIRE researchers visited an interesting box culvert reinforcement project in Euless, near Dallas Fort Worth International Airport. As highway demands increase on American roadways, so too do the demands on all related infrastructure. Castin-place concrete box culverts under roadways have been used for decades in highway construction and the challenge often becomes how to repair and/or strengthen these structures effectively without



Graduate Students together with Ryan Kelly, FRP Construction LLC.

sacrificing cross-sectional area of the culverts. The application of carbon or glass fiber reinforcing polymer (FRP) can provide strength and protection to concrete culverts while maintaining efficiency of the drainage system where other more traditional methods of strengthening may not. In many cases, these culverts provide tight working conditions with long, cramped spaces that are not conducive to conventional means of construction. The application of FRP fabric requires little space for application, making it ideal for use in tight spaces.

This box culvert supports State Highway 183, as well as an existing earthen embankment running along the highway. The concrete box culvert is approximately 375 ft in total length and consists of two 3 ft by 7 ft barrels. New construction to SH183 above required that additional soil be placed over approximately 250 ft of the length of the culvert. Project implementation included both traditional concrete strengthening methods, as well as FRP wet layup to provide both strength and durability. By constructing concrete load bearing partitions down the centers of the barrels, thus creating a four-barrel culvert, the shear demand on the top slab of the culvert was reduced. Additionally, wet layup of glass FRP (GFRP) fabric was implemented to strengthen the top and bottom concrete slabs for flexure.

CUIRE would like to thank Austin Urton, PE, QuakeWrap Inc. and Ryan Kelly, FRP Construction LLC for providing this opportunity to students.



Application of GFRP Wet Layup

#### CUIRE & SOUTH CENTRAL CHAPTER OF NASTT HOSTED SECOND TRENCHLESS TECHNOLOGY AND PIPE CONFERENCE

On Tuesday, June 20, the South Central Chapter of NASTT (SC-NASTT) and CUIRE held the second Trenchless Technology and Pipe Conference (TTP 2017) at the University of Texas at Arlington, with more than 130 people attending. Attendees received a copy of all the presentations on a USB drive and a certificate of completion.

At the general session, attendees were welcomed by Dr. Mo Najafi, CUIRE Director; Larry Johnson, SC-NASTT President, Alan Goodman, SC-NASTT Vice President; Dr. Ali Abolmaali, Chair of Civil Engineering and Dr. Peter Crouch, Dean of Engineering. The highlight of this general session was presentation of four \$2,000 student scholarships by SC-NASTT from the proceedings of TTP 2016, held on Tuesday, Aug. 23, 2016, at UT Arlington. The keynote presenter was Travis Andrews, with City of Fort Worth Water Department, who spoke on upcoming City of Fort Worth capital improvement projects for water and sewer.

The following companies and organizations exhibited their products and services:

- Hammerhead Trenchless
- Ditch Witch
- LMK Technologies
- Ace Pipe Cleaning Inc.
- Fuquay Inc.

- Insituform
- Tulsa Rig Iron
- SpectraShield Liner System
- CUES, Inc.
- Vacmasters
- StraightLine HDD
- Mears
- Alliance for PE Pipe
- CUIRE
- Hobas Pipe USA
- IPR- South Central
- US Pipe (a Forterra Company)
- HTS Pipe Consultants
- Primus Line

The technical program included two tracks of New Pipeline Installations and Renewal/Rehabilitations/Replacements of old pipelines. Speakers were:

- David Ellett, BRH GARVER
- Robert Stanley, Arlington Water Utilities
- Yovani Zelaya, Akkerman
- Bruce Jameson, Ace Pipe Cleaning
- Alan Goodman and Jason Pollock, Hammerhead
- · Ed Diggs and Mac McGarry, CUES, Inc.
- Justin Taylor, CCI Associates Inc.

- Chris Igo, Kimley-Horn and Associates, Inc.
- Seth Matthesen, Ditch Witch
- Wayne Hunter, RPS Group
- Al Meschke, Murphy Pipeline
- Tim Peterie, Insituform Technologies
- Peter Dyke, PE- Pipe
- Wayne Love, Fuquay Inc.
- · John Moody, Primus Line
- Michael Jereb, LMK Technologies
- · Victor Rivera, Hobas Pipe USA
- · Sam Arnaout, U.S. Pipe
- · John Newell, Pipe Burster
- · Van Young, ConShield
- Vinayak Kaushal, CUIRE
- Dr.Antonio Miglio,Structural and Hydraulic Consultant

Silver Sponsors: Underground Solutions, Inc.; LNV, Inc.; Kimley-Horn; and RPS Klotz Associates.

**Lunch Sponsors:** Ditch Witch, Hobas Pipe USA and Hammerhead.

For more information on next year's TTP 2018 conference, email *cuire@uta.edu* or contact Alan Goodman at *AGoodman@ hammerheadmole.com* 

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