

CUIRE Holds 1/2 Day Certification Schools

Sunday & Monday

January 25-26, 2015
Hilton Americas, Houston, Texas

Sunday, January 25, 2015

Morning – 8:00 AM to 12:00 PM

■ Geotechnical School®

Geotechnical requirements for both trenchless applications. Soft soils and rock investigations methods, and how ground conditions will impact trenchless feasibility and productivity.

■ Pipe School®

Applications, advantages and limitations of each type of pipe, such as steel, ductile iron, vitrified clay, PVC, HDPE, fiberglass, etc., and new developments in pipe materials and jointing systems.

Afternoon—1:00 PM to 5:00 PM

■ Mud School for Trenchless Technology

will provide attendees everything they need to know to properly mix and apply drilling fluids for trenchless applications, including spoil removal and lubrication applications.

■ Horizontal Auger Boring School®

Planning, design, construction of conventional pipe jacking and Horizontal Auger Boring. Includes Pipe Ramming.

Monday, January 26, 2015

Full Day: 8:00 AM to 5:00 PM

■ Advanced Horizontal Directional Drilling (HDD) School®

Planning, design, construction, of large, mid and small size HDD projects from inception to closeout and delivery. Includes, tracking and locating, pipe loads, bore planning, drilling fluids, and case studies.

Morning – 8:00 AM to 12:00 PM

■ Pipe Lining and Renewal School®

Cured-in-Place Pipe (CIPP) and pipe lining methods. Includes planning, design, construction, inspection, and QA/QC.

Afternoon—1:00 PM to 5:00 PM

■ Pilot Tube Microtunneling School®

Planning, design and construction of pilot tube microtunneling. Includes case studies.

Schools	Early Registration BEFORE Dec. 1, 2014	Regular Registration AFTER Dec. 1, 2014
1/2-Day	\$195	\$295
1-Day	\$395	\$495
2-Day	\$695	\$795

2014 CUIRE Board Members

The CUIRE Board members are the backbone of our organization and we would like to recognize them for all their support and dedication.

Sam Arnaout	Hanson Pressure Pipe
Ralph Carpenter	American Ductile Iron Pipe
Robert Carpenter	Underground Construction Magazine
Frank Crumb	City of Fort Worth
Mark Dionise	Michigan DOT
Bruce Hollands	Uni-Bell PVC Pipe Association
Julia Hunt	Trinity River Authority of Texas
Tim Kennedy	Ameron/NOV
Chad Kopecki	David Marshall Tarrant Regional Water District
Rich Mielke	Northwest Pipe Company
Lynn Osborn	Insituform Technologies
Anna Pridmore	Structural Technologies
Anton F. Jachim	3M Water Infrastructure Solutions
Camille Rubeiz	Plastic Pipe Institute
Jim Rush	Benjamin Media Inc.
Larry Slavin	Outside Plant Consulting Services
Richard Willamsee, Jr.	Texas DOT



By completing each School you will receive:

- A complimentary copy of new book, Trenchless Technology: Planning, Equipment and Methods - a \$115 value! (for 1-day and 2-day schools)
- A wallet-size certification
- Up to 1.4 CEU's and 14 PDH's
- A PDF copy of all the presentations
- As a bonus, a full complimentary registration to UCT is also included with each School registration (includes daily registrations)!
- Your name and company information will be featured for three years on CUIRE Web site (Optional)

CUIRE Develops a Testing Protocol to Evaluate Durability and Reliability of Large Diameter (16 in. and Larger) HDPE Pipe for Water Main Applications

CUIRE was awarded a research contract by the Water Research Foundation (WaterRF) in November 2012 for the proposal entitled *Durability and Reliability of Large Diameter (16 in. and larger) HDPE Pipe for Water Main Applications*. CUIRE is conducting this research in partnership with Benton & Associates, Inc. (B&A), Jacksonville, Illinois, and Black & Veatch Corporation (B&V), Kansas City, Missouri.

CUIRE is the only known testing facility to conduct fatigue testing of large diameter HDPE pipe

Accomplishments To Date

- Completed a literature search on large diameter HDPE pipe.
- Completed a nationwide survey of water utilities.
- Performed expert workshops with water professionals.
- Designed and started the experimental work.
- Completed nine case studies.

Present Status

1. Literature Search — The literature search is completed with more than 70 citations found through Engineering Village, ProQuest, No-Dig, and ASCE databases. The literature search has provided information on the benefits and limitations of HDPE pipe compared with other pipe materials used for water applications. The findings have helped the project team to conduct a survey of water utilities, and develop a testing plan.

2. Survey — A survey was sent to more than 400 water utilities to collect information on the application of large diameter HDPE pipe in actual field conditions. The survey asked questions on restrictions of using and installing HDPE pipe, leakage issues, causes, rates and modes of HDPE pipe ruptures, environmental and maintenance aspects of the large diameter HDPE pipes, and so on, as they may influence reliability and durability of the large diameter HDPE. Overall,

most of the utilities are satisfied with use of HDPE pipe. Nonetheless, there are concerns with service connections and tapping, repairs, permeation, and oxidation. These topics will be further investigated in this research project.

3. Workshop with Water Professionals — The Project Workshops provided valuable input to the project and assisted the Project Team to improve upon the project scope and experimental approach. The structured approach utilized for the workshops allowed the critical topics to be identified in an efficient manner. The limited and valuable time of participants was mostly devoted to discussion of the most critical topics. The workshops enabled the Project Team to explore different perspectives and identify several studies and experiences brought up by the project participants.

Specifically, the following areas were explored in detail during the course of the three workshops organized by the project team:

- Perception issues related to use of HDPE for large diameter pipes and strategies to address those issues
- Outstanding issues related to specifications, design, installation and maintenance of large diameter HDPE pipe and strategies to address those issues
- Issues related to pipe jointing and fittings and strategies to address those issues

The following specific strategies were offered for the HDPE pipe industry:

- Establishing a Center of Excellence for HDPE Pipe to promote “Best Practices” for HDPE pipe.
- Documenting successful installations of HDPE pipe.
- Encouraging utilities to provide both water and gas service to use HDPE for water applications as they already may have an experience base with use of HDPE for gas applications.

- Encouraging contractors with gas pipe installation experience to serve the water market.
- Highlighting the advantages of HDPE pipe such as its leak free nature due to butt-fused joints.
- Sharing the experience of gas market with water market.
- Developing guidelines for design professionals, installers, inspectors, and operators of HDPE pipe.
- Developing “Best Practices” for all aspects of HDPE pipe.
- Developing guidelines for evaluation and condition assessment of HDPE pipe.
- Developing and offering training to all professionals involved in the design, installation, inspection, and maintenance of HDPE pipe.
- Partnering with trade schools to train the required workforce.
- Developing and offering certification for various professionals involved in the design, installation, inspection, and maintenance of HDPE pipe.

The following specific recommendations were offered for utilities:

- Considering life cycle cost when selecting a pipe material.
- Utilizing Quality-based Selection (QBS) process to select qualified design consultants.
- Specifying an acceptable level of qualifications for contractors.
- Engaging qualified professionals to perform forensic evaluation of failure incidents to learn from the failure and ensure the root cause of failure is established and eliminated from future design.



The following specific recommendations were offered for pipe installers:

- Hiring trained personnel or offering full training and supervision for their personnel who may not be fully experienced.

The following specific recommendations were offered for pipe manufacturers:

- Streamlining of HDPE pipe product lines to reduce variety of products available and minimize confusion.
- Offering fittings as well so that the utility is dealing with a single source for its needs.
- Developing solutions for connecting HDPE to valves and other pipe materials.
- Offering regular field observations to promote best practices.

4. Experimental Work – The objectives of the experimental task are to conduct high pressure cyclic loading fatigue test on new HDPE pipes with a joint. The results of the tests will be compared with manufacturing specifications (in particular to pressure ratings of the pipes) and design information of these pipe materials. The fatigue tests will enable the research team to determine whether a 16-in. diameter HDPE (DR 17)

or 18-in. diameter HDPE (DR 21) can withstand cyclic loads that are 1.5 times higher than the long-term pressure rating of the pipe for an extended period of time (two million cycles with a 7- to 10-second period). The testing setup comprises of a water supply tank, multi-stage centrifugal pump, data acquisition system, control board, pressure transducers, DC power supply, specimen (16-in. & 18-in.), and control valves including back flow pressure and solenoid valves. Currently a cycle time of 7 seconds is achieved. Up to this date more than 500,000 cycles for the 16-in. (DR 17), 15-ft long pipe, between 125 psi and 188 psi are completed. It is estimated that 2 million cycles will take 5 to 6 months to complete.

5. Perform Case Studies – Real world experience is important in applied research, and this fact is perhaps more pronounced for the pipeline industry. As such, the Project Team started to gather information about actual large diameter HDPE transmission main projects from the beginning of this study. These experiences from public and private water utilities as well as other private enterprises were presented as case studies, with more details in Progress Report # 6.

The Project Team contacted a number of water utilities (public and private) and engineers/managers that were involved in HDPE transmission main projects. In addition to finished/raw drinking water transmission mains, HDPE transmission pipelines used for irrigation, and for one case, brine solution conveyance were also included as the pipelines used in these types of projects operate under very similar conditions to that of drinking water transmission mains.

In addition, the Project Team made attempts to utilize other media (i.e., project workshops, conferences, and social media on the internet) to solicit case studies from the utilities that have experience with HDPE transmission mains. Collecting case studies from water utilities has imposed a challenge for the Project Team for the following reasons:

- The number of utilities that use HDPE for transmission mains is very limited (hence this project).
- The majority of the few water utilities that use HDPE for transmission mains as their primary choice of pipe material, had attended the project workshops; and therefore, they are less motivated to provide specific case studies to share their experience in a different platform.
- The utilities that do not use HDPE for large or small diameter are reluctant to take the time to prepare case studies.

Some of the case studies (particularly those from the pipe manufacturers) gathered to date may be biased as they are from select projects

for marketing purposes. As such, these case studies were edited by the Project Team to deliver the appropriate content commensurate with the objectives of this research project.

CUIRE Develops a New Master of Construction Management with Focus in Underground Infrastructure



The new Master of Construction Management degree is an interdisciplinary program focused on management of construction projects. It includes elective courses from Architecture, Business, and Management. This Master's degree is designed mainly for applicants with an undergraduate degree in civil engineering, but students with different undergraduate disciplines can enter the program taking the assigned leveling courses.

Focus on Underground Infrastructure

To specialize in underground infrastructure and trenchless technology, students will take the following courses:

- CE 5388 Pipeline Construction and Trenchless Technology
- CE 5389 Pipeline Asset Management and Sustainability
- CE 5345 Infrastructure Evaluation, Maintenance and Rehabilitation
- CE 5300 Public Private Partnerships (P3)
- General Elective with Approval of Program Director

For more information contact:

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BACK IN THE DAY

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