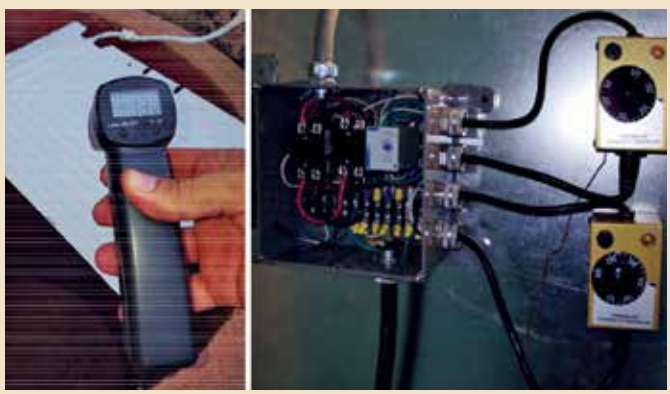
Trenchless Technology Center Newsletter

SEPTEMBER 2016

FOCUS ON RESEARCH: Effects of Freeze-Thaw Cycles on Manholes



Cities in northern parts of the United States and Canada usually experience damaging effects of freeze-thaw cycles in sewer systems, typically at the chimney section of the manholes. Rapid degradation and cracks along the deployed adjustment mechanisms like mortar, shims, and grade rings are observed due to movement in roadways and pressures exerted by freezing water. Deteriorated manholes are rehabilitated using different technics but freeze-thaw performance data of such technics are not easily available.

TTC proposed a small scale experimental setup for applying freeze-thaw cyclic conditions in the laboratory and calculating principal stress due to such thermal changes. A clay pipe of 2 ft in diameter would be placed inside a 4-ft square wooden box. Next, four strain rosettes at top and bottom – two on inside and two on outside surface would be attached along the same line. Two thermocouples would be positioned at the vicinity of the strain rosettes. The inside of the pipe would be sprayed and the void between the pipe and box would be carefully filled with soil. A refrigerator cooling unit covered with Styrofoam would be positioned on top of the pipe. The cooling unit will be operated using an electronic timer and thus simulating freeze-thaw conditions. Data would be recorded using a data acquisition system and reviewed during and after completion of the test to include tabulation and graph views. Thus, the effect of freeze-thaw cycles on the manhole coating system can be evaluated. Based on this setup, a full-scale experimental setup will be possible to prepare.

Contact Dr. Shaurav Alam, 318-257-2053, *shaurav@latech.edu* or Dr. Tom Iseley, 318-257-2852, *dtiseley@latech.edu*.

TTC Utility Investigations School 2016

In August, TTC hosted the first Utility Investigations School (UIS), developed with ASCE's Utility Engineering and Surveying Institute (UESI). It was a five-day course which provided students the knowledge and tools to provide competent utility investigations in accordance with accepted national standards. The course

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covered geophysics, utility systems construction and configuration, ASCE 38 risk based presentations and professional liability issues.

Jim Anspach, Chair ASCE 38 and President-Elect UESI, developed the school curriculum. The instructors were recognized experts in the field of subsurface utility engineering, applied geophysics, and utility system design and operation. Selected manufacturers sponsored the school — IDS North America and Subside Electronics (platinum sponsors), Leica and Sensit Technology (gold sponsors), and Pipe Horn and Vivax-Metrotec (silver sponsors) — by providing equipment on site for use and demonstration. Finding utilities is like a big puzzle and seeing the different equipment and the unique differences during practice session resonated well with the students.

A total of 34 students attended. Some of them have been in the utility mapping business for many years and were still pleasantly surprised at how much more they have learned. After completing the school, students ended up with a greater appreciation of their liability and knowledge how to manage it effectively. The students earned a Certificate of Completion of Utility Investigations School (UIS) Course 401 Geophysical Investigations and continuing education credits. The UIS will continue to be offered based on demand. For more information, visit *ttcspecialtyschools/uis* or contact Jadranka Simicevic, *jadranka@latech.edu*.

TTC and China's Sponge Cities

Dr. Iseley has been invited to be a keynote speaker at the first "Wuhan Home Innovation Summit" in Wuhan, China, on Sept. 21. The summit is sponsored by China Association for Science and Technology. In recent years, China has been experiencing huge problems from flooding. Negative socioeconomic impacts of floods, including life and property losses and damages to the environment, social life and economy, have long-lasting consequences. Floods in China continue increasing at an alarming rate, where the driving factors are population growth, urbanization and global climate change impacts. Solutions are urgently needed to achieve sustainable flood prevention. In April 2015, China's central authorities selected 16 cities to be pilot "sponge cities." Each of them will receive up to $63 million per year over three years for water related initiatives aiming at improving flood management and achieving sustainable flood prevention in the future. Meanwhile, storm water best management practices will provide cost-effective ways to control flooding, protect resources, and address issues of water quantity and quality. Dr. Iseley visited China for the first time in 1987 and has been visiting China frequently over the years He will work with Chinese companies and utilities on identifying ways how TTC can help China's Sponge Cities.

TTC and Flint, Mich.

In July, a regional seminar in Detroit was conducted by MSTT which provided an excellent overview of the issues related to the water crisis in Flint, Mich. Next, a Water Infrastructure Summit (WIS) will be conducted in the fall of 2016 (exact date TBD) by the DEQ Office of Environmental Assistance with focus on developing solutions for the crisis. Dr. Iseley will serve on the Technical Steering Committee (TSC) for this summit. He pulled together an international team of academic researchers with strong working relationships with the most advanced technical solutions for underground infrastructure. He is putting together a solutions initiative to be presented at the opening of the summit. The Program Advisory Committee consists of Drs. Tom Iseley, Sam Ariaratnam, Mohammad Najafi, Baosong Ma, Mark Knight, Dulcy Abraham and Declan B. Downey.

Municipal Forums Update

The 2016 Fall Municipal Users' Forum Program will include the following forums: Nov. 3, Columbus, Ohio; Dec. 1, San Antonio, Texas; Dec. 6, Seattle, Wash.; and Dec. 8, Portland, Ore./Vancouver, Wash. Dates are subject to slight changes so please look at the TTC website for the most updated information on location and dates of forums. TTC is working on scheduling additional forums in November and December. If you are interested in hosting a forum, having specific topics included in program or would like to present at any of the forums, please contact TTC. The one-day programs are $55 for municipal participants. Participants can earn CE units for attending (a $15 certificate fee applies). Online registration for the forums is done through an Eventbrite site and the link is available at *ttc.latech.edu*. For information, contact Simicevic at 318-257-2744 or *jadranka@latech.edu*.

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Trenchless Technology Center

Louisiana Tech University

DIRECTOR:
Dr. Tom Iseley

ASSISTANT DIRECTOR:
Jadranka Simicevic

RESEARCH PROGRAM MANAGERS:
Dr. Shaurav Alam
Dr. Arun Jaganathan

FINANCIAL MANAGER:
Fredda Wagner

SENIOR ADVISOR:
Dr. Ray Sterling, Professor Emeritus

MAILING ADDRESS:
P.O. Box 10348
Ruston, LA 71272-0046 USA
Phone: (318) 257-4072 | Fax: (318) 257-2777
E-mail: ttc@Latech.edu
Web site for TTC: www.ttc.latech.edu

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