



# Trenchless Technology Center *Newsletter*

M A R C H 2 0 0 3

## WERF to Provide Funding for Research on I&I Issues for Sewer Laterals

TTC was recently selected by the Water Environment Research Foundation (WERF) to undertake a project to research methods for cost-effective rehabilitation of private sewer laterals. The research has the objective to identify and resolve infiltration and inflow (I&I) issues attributable to sewer laterals.

Thus, the study will first explore methods to identify and quantify I&I and will then examine the technical, legal and financial aspects of rehabilitation options, offering suggestions to wastewater utilities as to addressing these issues in a satisfactory manner.

Members of the project team working with TTC are: Black & Veatch, Wade & Associates and Computer Solutions and Services. The project will also be supported by a large project advisory committee, the efforts of the center's Industry Advisory Board and the commitments of many public agencies to provide I&I data and other assistance to the project.

Millions of laterals exist throughout the United States; many are responsible for a significant amount of I&I into sanitary sewer collection systems. The result is that I&I is often responsible for sanitary sewer overflows (SSOs), environmental problems and costly damage to private and public property.

Despite a growing awareness of problems related to laterals, many municipalities still don't know exactly how much the laterals contribute to total I&I in their systems and inspection and rehabilitation is often put off due to a variety of understandable reasons. First, because of the number of laterals in systems, their inspection and rehabilitation can be expensive. Second, there is currently little guidance available to determine which specific inspection and rehabilitation options would work the best in specific conditions and be the most cost-effective. Third, accessing private properties may involve significant liability issues. Fourth, the municipalities need to decide on sources of funding. Spending public funds on private property is also an issue.

Through the WERF project, the TTC-led research team will address the challenges that are posed by problems with sewer laterals. TTC director and principal investigator for the project Ray Sterling is

enthusiastic about the scope of the project, commenting that, "The lack of reliable information in the area of laterals is an ideal opportunity for the center to develop a stronger database of information, as well as practical information on the subject."

The result of TTC's two years of work will be a comprehensive resource guide, describing existing and emerging methodologies and technologies for identifying sources of I&I and its quantification by the source and for locating and condition assessment of laterals. The resource will give a comprehensive overview of rehabilitation options and evaluate their performance and efficiency based on literature and field data. In addition, the resource will document liability issues and likely solutions to address these issues and outline the methods for financing private lateral rehabilitation and assess their success rates.



TTC is conducting a study to identify and resolve infiltration and inflow (I&I) issues attributable to sewer laterals.

Project manager Jadranka Simicevic is also excited to have the chance to address key issues in reducing I&I in wastewater systems. "We have a true challenge on our hands," Simicevic says. "There are many issues to be examined and resolved, and we are anxious to deliver solutions. I am really looking forward to working with municipalities throughout the country and have their experience and ideas employed in this study. We have an excellent research team of consultants, industry and municipalities providing a vast experience with sewer systems and lateral renovation. This promises to be a very interesting project."

Currently 10 municipalities have committed to assist and provide resources for this project. Should your municipality be interested in participating and contributing information to TTC for this study, or if you have information relating to lateral renovation or replacement techniques, please contact Simicevic at either (318) 257-2744 or [jadranka@coes.latech.edu](mailto:jadranka@coes.latech.edu).

## Municipal Forum Update

TTC is about to kick off its spring 2003 Municipal Forum Program. The fall 2002 Forum Program, with two new forums in Louisiana and one relocated to Austin, Texas, was very well received.

The Colorado Municipal Forum will open the spring Forum Program with its meeting on March 26 in Westminster, Colo. Participants will discuss CIPP repairs to tap connections, sewer scanning systems and sewer classification for rehabilitation purposes. The Columbus Municipal Forum will be the next meeting and will take place in Cleveland, Ohio, on April 10.

The meeting will focus on the use of DVD software for televising sewers and the group will take a field trip to a tunnel construction site. The Northwest Forum will meet in Tacoma, Wash., on April 17 and address the issues of pipe ramming and pipe bursting.

In May, both the ARKLAMISS and the Gulf Coast forums will take place. On May 17, the ARKLAMISS Forum will meet again in Ruston, La., and cover the topics of trenchless methods, pipe ramming and ground penetrating radar. Soon afterwards, on May 22, the Gulf Coast Forum will discuss locating services and inflow and infiltration issues from private properties in Baton Rouge.

In July the Texas Municipal Forum will bring the spring program to a close and meet in Austin to cover lateral issues. Because TTC is engaged in a major study for WERF on the potential impact of lateral rehabilitation, the Kansas City Forum is also planning a special meeting in the fall that will address lateral rehabilitation, among other topics.

Should you be a public works employee and be interested in participating in any of the Municipal Forum Programs, please contact Anne McLean, program coordinator, at either [mclean@coes.latech.edu](mailto:mclean@coes.latech.edu) or at (318) 257-4072.

## Students in Regional Competition Advocated for Trenchless Technology

Early last month, Dr. Jerold Stegeman gathered a team of six Louisiana Tech University students to participate in the Associated Schools of Construction (ASC)/ QUOIN Foundation (formerly Dallas & Fort Worth AGC Foundations) Region V Student Competition in Dallas.

Colleges and universities represented at the competition came from Louisiana, Texas, Oklahoma and Arkansas. The winner of the regional event will be entered into the national competition. This was the first time that Louisiana Tech participated in this annual event.



The Louisiana Tech team was the only entry to utilize trenchless methods in their construction plans.

The students, all seniors, specialized in Construction Engineering Technology, and were entered into the Heavy/Civil category of the competition where they were given plans to an actual construction project that had been completed by Granite Construction in Phoenix. Over an 18-hour day, the team had to develop a plan, estimate and submit a bid on this project to the panel of judges, who were representatives from Granite Construction. On the following day, each team orally presented their recommendations to the panel.

In this particular project, storm sewers needed to be installed in a suburban setting. A portion of the construction required that the sewers run under a busy intersection. The team debated the pros and cons of open-cut vs. trenchless methods and decided to endorse the use of trenchless technologies. They noted that trenchless methods would be a cost-effective and cause the least disruption to the roadway activities. To their credit, the Louisiana Tech team was the only regional college team to consider trenchless methods.

The judges found this proposal commendable and innovative. They noted that trenchless methods were considered for the actual job, however, a number of previously unidentified underground utility lines were found during actual construction. These utilities might have hindered the effectiveness of trenchless applications and in the end other construction techniques were implemented.

Although the team did not receive an award, all members felt it was a valuable experience. Student Gary Beck Jr. particularly enjoyed that the competition involved an actual construction project and that all aspects of the competition mimicked those in real-life.

"It [the competition] allowed us to be in the shoes of an actual contractor and to experience the complexities and time pressures that take place in real life," Beck says. "It was a situation that would be difficult to replicate in an academic setting."

## TTC Faculty Awarded NASA Grant

Dr. Abdelkader Tayebi has been awarded a grant from NASA to study miniaturization technology for micro-electro-mechanical systems (MEMS) or microsystems (MST) that will be used in microspacecrafts. Over the past two decades considerable progress has been made in MEMS fabrication technologies, resulting in a variety of commercially successful devices.

Given its relative newness, reliable standards to measure the quality and durability of MEMS have yet to be adequately defined and developed. Tayebi's research aims to establish an integrated, working framework for reliability and quality assessment of MEMS.

Although Tayebi's work on miniaturization technology focuses on MEMS use in space, it does have very important applications for trenchless technology. Currently, guidance systems used in horizontal directional drilling (HDD) tend to be large and can only fit into certain pipe diameters.

With miniaturization technology, the size of locating devices will be greatly reduced, so they can be inserted into smaller diameter drill pipes. This advancement Dr. Tayebi says, "Will be of particular use in urban areas, where underground space is at a commodity

and accuracy for HDD jobs is paramount."

In addition to the reliability assessment grant, Tayebi has submitted a second grant to NASA on MEMS that will examine how to raise the performance of MEMS devices through mathematical optimization. In principle, this mathematical process can be applied to MEMS devices used on Earth in trenchless technology. Although environmental conditions are vastly different between space and Earth, the same MEMS device can be evaluated through the same mathematical optimization process for its use in trenchless technology. Currently, NASA recommends this proposal for funding and is awaiting final approval.

The research interest in microsensors for trenchless technology applications is part of a center-wide thrust that allows TTC to tackle major barriers to effective underground infrastructure systems through cooperation with faculty and use of the state-of-the-art research facilities at the Institute of Micromanufacturing at Louisiana Tech University.



Tayebi

## Trenchless Technology Center Newsletter

March 2003

### Trenchless Technology Center

Louisiana Tech University  
Director: Dr. Ray Sterling

Program Coordinator:  
Anne McLean

Mailing address:  
PO Box 10348  
Ruston, LA 71272-0046 USA

Phone: (318) 257-4072  
Toll Free: (800) 626-8659  
Fax: (318) 257-2777

E-mail: [ttc@engr.latech.edu](mailto:ttc@engr.latech.edu)

Web site for TTC:  
<http://www.ttc.latech.edu>

The TTC Newsletter is published as a department within Trenchless Technology. All newsletter materials are prepared by TTC. Communications should be directed to the center.