



Trenchless Technology Center Newsletter

January 1999

Trenchless Technology Focus of Proposal for Engineering Research Center

Led by the Trenchless Technology Center, Louisiana State University, the Institute for Rehabilitation of the Sewer Infrastructure at Southern University and the Department of Industrial and Engineering Technology at Grambling State University are cooperating in a proposal to create an Engineering Research Center on Trenchless Technology. This proposal follows two prior submissions by teams involving Louisiana Tech University on similar topics related to underground infrastructure. These proposals were well received but not funded.

After considering the review comments from the previous submissions and the growing importance of trenchless technology within underground utility installation and rehabilitation and replacement, it was decided to focus the new effort specifically on trenchless techniques. This provides a natural fit to the strong support provided by industry to universities within the trenchless field and particularly

builds on the university-industry cooperation built by the TTC over the past decade. It also provides a clearer concept of the anticipated results of the research and development effort.

The vision of the center over its proposed 10-year life is to develop next-generation, integrated systems for installing, managing, rehabilitating and replacing underground utility systems with minimal surface disturbance. The proposed research program is still evolving, but the research thrusts are expected to include:

- New installation technologies
- Rehabilitation and replacement technologies
- "Seeing" through the ground
- Sensor development
- Life cycle data management and decision systems

Higher accuracy, lower risk and more economy are goals in the development of new trenchless techniques and the refinement of old techniques. This will in-

volve development of new materials to meet the particular demands of trenchless technologies, new or improved technologies in underground locating and obstacle detection, and development of low-cost sensors to track the deterioration of underground materials and structures. Overall, any individual advancements need to be integrated into a systems approach that will allow the most cost-effective approach to the entire life-cycle of underground utilities.

The research team will be drawn from many different disciplines at the partner universities, including civil engineering, mechanical engineering, electrical engineering, mathematics, statistics, computer science and physics. In addition, nationally-known faculty in the key areas of technology development from other institutions will be invited to participate in the research program.

The research will draw on the facilities and expertise available in micro-

TTC Faculty Members win NSF Grant

Dr. David Hall, Dr. Raja Nassar and Dr. William Jordan initiated work in fall 1998 on a research project for "Modeling and Accelerated Testing of Cured-in-Place Plastic Sewer Rehabilitation Liners."

The proposed research to be completed under this three-year, \$273,724-award will complement ongoing research at the TTC on long-term creep-induced buckling of liners through coupled experimental and analytical research programs. The experimental program will involve room-temperature and elevated-temperature material characterization tests of CIPP liner materials as well as creep-buckling tests of liners at these same temperatures.

The softening of these materials with increasing temperature will be used to

establish a relationship between time and temperature such that long-term performance over decades at ambient temperatures can be predicted by tests performed

on a shorter time scale (less than three years) at an elevated temperature. These results will reduce the level of extrapolation inherent in current methods that extend liner buckling tests over 1.14 years to predict a response over 50 years or more.

The analytical program will examine closed-form solutions to the buckling



Dr. David Hall and Dr. Bill Jordan.

problem and will involve an extensive amount of finite element and statistical modeling of liner buckling. The statistical variation of liner buckling times as a function of the external pressure and liner/host pipe geometry parameters will be assessed to determine the probability that a liner system will survive for the desired design life.

for Engineering Research Center Proposal -concluded

manufacturing, remote sensing, particle physics and simulation at LTU and LSU and collaborate with the Institute for Rehabilitation of the Sewer Infrastructure at Southern University that is being funded by the EPA and U.S. Army Corps of Engineers. The Department of Industrial and Engineering Technology at Grambling State University will assist in outreach and educational efforts.

New IAB Members Welcomed

The TTC is pleased to announce new additions to its Industry Advisory Board:

Reichhold Inc. joins the board in 1999 and will provide input from the perspective of a major resin supplier to the trenchless industry.

Underground Construction magazine joined the board in October 1998 and joins *Trenchless Technology* magazine, a founding member of the IAB, in this category. Such members provide important information to the TTC on

If funded, the combined result of National Science Foundation funding and matching funds from industry, municipalities and universities would result in nearly \$20 million dollars of research and education efforts in the trenchless field over the initial five-year funding period. This figure would be doubled over the full 10-year life of successful centers.

activities and issues across the industry as well as providing key support for the transfer of research findings to the user community.

SunCoast Environmental International Inc. joins the board in 1999. SunCoast manufactures and installs systems for relining manholes to control I&I and to prevent further manhole deterioration. SunCoast underscores the importance of manhole rehab in trenchless sewer system upgrades.

Municipal Forums Gather in Columbus and KC

The first regional municipal forums held in the Columbus and Kansas City areas met on Sept. 16, 1998, and Oct. 7, 1998, respectively.

The meetings followed a similar format to the previous Houston meetings with introductions of each municipal program and their experience with trenchless technology.

In afternoon sessions, forum participants focused on sharing experiences on how they select acceptable technologies and materials, how they contract for trenchless work and how the



Joe Barsoom (left), City and County of Denver—a member of the TTC executive committee, and Fred Banister, Minneapolis-St. Paul Metropolitan Council, discuss experiences at Kansas City forum.

various trenchless methods have worked in their communities. Key issues raised were the quality of the contractor actually implementing the technology in the field and the manner in which the contractor handles problems with the affected public (e.g., dealing with a missed lateral reconnection).

Further meetings of the municipal forums were planned in connection with the Underground Construction Technology meeting in January 1999 and in Columbus in February 1998.



Participants at the Kansas City Municipal Forum included (from left to right): Michael Lindebak, City of Wichita; Pete Sanocki, Metropolitan St. Louis Sewer District; Steve Birdsall, Loveland, Colo.; Bob Moore, Greeley, Colo.; Susan Marino, Omaha; and Richard Cornelius, Minneapolis.

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