



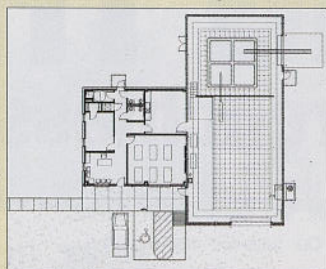
Trenchless Technology Center *Newsletter*

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National Trenchless Technology Research Facility Under Construction

A proud moment arrived for all the TTC faculty, staff, students and Industry Advisory Board members when the contract was signed to construct the first phase of the National Trenchless Technology Research facility. The contract was signed on July 20, 2006 and the construction period is planned for approximately seven months, leading to building completion in March 2007.

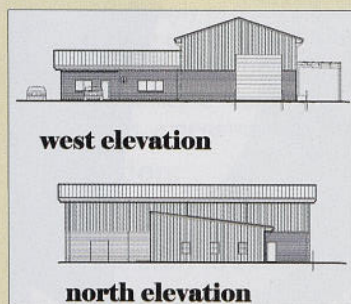
Because of the sharp increase in construction prices since the initial building estimate was prepared, additional funds had to be found quickly once the bid was received. The total design and construction price for the building is approximately \$775,000 and



Construction phase for the facility is seven months.

there will be a number of items to add after the basic construction is finished. First will come the National Science Foundation-funded soil-structure interaction facility and then as funds allow, an overhead crane and strong floor for the high bay space will be added. The final result of Phase 1 will be a 40-ft wide by 85-ft long by 22-ft high structural testing area

that incorporates a 20-ft by 20-ft by 8-ft high soil chamber. Ancillary facilities will include a medium-size seminar room, a graduate office area, a specimen preparation area and a reception area. The total investment will be around \$1.3 million. The building has been designed for a second phase that will



add a suite of additional small wet and dry laboratory spaces, more graduate student offices, a computer simulation center, a new home for the TTC reference materials and secure facilities as a base for sensitive collaborative research with industry partners.

The new facility is the cornerstone of a continued expansion of the TTC physical research and education facilities which currently include:

- A field testing facility covering an approximate area of 1.6 acres. This area is immediately adjacent to the new research facility and has been used for a variety of tests involving microtunneling, auger boring, pipe bursting and steerable impact moling.

- Liner test facilities for external pressure and internal pressure performance studies for sewer, water and gas applications. This research has long been a specialty of the TTC research program.
- A 12-ft by 6-ft by 4-ft high soil box for education and research purposes. This soil box has just been modified to allow a pressure bladder above the soil to apply the equivalent of 20 ft of additional soil depth.
- A demonstration inversion unit for cured-in-place lining. This allows students to witness a dry inversion to understand the process and to conduct wet inversions to produce samples for inspection and testing.
- A rheology laboratory. This allows six pairs of students to conduct a variety of tests to understand the properties of drilling mud.
- A utility locating test bed that will occupy part of the field test site. This is due to be put in place later this year and will be used both for research and validation purposes in connection with new approaches in addition to provide a place for the evaluation of existing utility locating techniques.
- A nano-pulse electromagnetic testing facility. This shared 2,400-sq ft testing facility houses more than \$1 million of sophisticated, electronic testing equipment and is used for the TTC technology development efforts in the areas of utility detection, "seeing-ahead" of a boring head and non-destructive testing for condition assessment.
- Tensile load cells of various sizes for field studies of HDD and pipe bursting.
- Soil characterization equipment that can be deployed in remote locations using HDD techniques.
- Material test facilities including extensive creep testing equipment and an extensive suite of characterization facilities available through the Institute for Micromanufacturing.
- A suite of pipe robotic equipment for assessment and repair of pipelines.

The physical facilities, in turn, are a part of a broad effort by the center to support innovation in the trenchless technology industry, to develop ideas into working prototypes and to offer a unique set of facilities, faculty expertise and technical resources related to trenchless technology.

There are still significant dollar needs to equip the building and opportunities to be recognized for support of the creation of the new facility. Please contact Dr. Ray Sterling if you would like to help.

Insituform Technologies Becomes a Major Building Donor

A major gift of \$25,000 toward completing the research facility was recently pledged by Insituform Technologies. Insituform joins the Building Patron, Mike Garver, and other Major Building Donors, Bob Affholder, Hugh O'Donnell (in memoriam), and CMC Joist in providing core support for the new building. Insituform is one of the companies that has been an Industry Advisory Board member and supporter of the TTC since its first formation in 1991. The company's willingness to step in and help close the funding gap and allow the building to proceed is most appreciated.

Bonestroo, Rosene, Anderlik and Associates Join the IAB

Minneapolis-based consulting firm Bonestroo, Rosene, Anderlik and Associates recently joined the TTC's Industry Advisory Board as a consultant member. The firm is an engineering and architecture firm with offices in Minnesota, Wisconsin and Illinois and is active in municipal engineering services. The firm was attracted to get involved with the TTC through its participation in the municipal forum programs held in Minneapolis. The firm's involvement continues a personal connection with TTC director Dr. Ray Sterling that goes back to his University of Minnesota faculty days.

TTC Advisory Board Meeting Set for October

The TTC is expecting to hold its largest advisory board meeting ever on Oct. 18-20 in Ruston, La., just prior to the WEFTEC meeting in Dallas. The IAB continues to grow and now comprises 36 participants from the public works agencies of large and small cities, from major consulting firms, and from many of the key industry firms in the trenchless technology arena (see sidebar for a full list). The meeting allows for networking and discussion of key R&D needs among the user and provider communities in the trenchless field. The IAB helps set the vision and strategic plan for the center and, at this annual meeting in Ruston, members will have the opportunity to learn and see first-hand the research projects under way at the center and to get to know the faculty and students involved in the research.

Underground Utilities, Hurricanes and Floods

As cities have become larger, more complex, more congested and more dependent on technology for their ability to function as an economic and social unit, there has grown the increasing problem of how to maintain the functioning of a city

during a natural or man-made disaster and how to speed the recovery of the city after such an event. Nowhere has the myriad of social and technical problems faced in such circumstances been more clearly demonstrated than in the City of New Orleans following the levee failures initiated by Hurricane Katrina.



TTC is researching the after effects on underground infrastructure as a result of Hurricanes Katrina and Rita.

Following the twin disasters of Hurricanes Katrina and Rita, TTC applied for and received an exploratory research grant from the National Science Foundation to collect information specifically on the damage inflicted on underground infrastructure as a result of these two hurricanes. This work has since broadened into a more extensive data collection from a number of cities that have experienced extensive storm and flooding damage and the creation of a GIS-based analysis that will correlate the damage mechanisms with what is known about loading conditions and the physical characteristics of the damaged areas. The end result of the work is intended to be a better understanding of how and why underground utilities get damaged in hurricanes, storm surges and floods and what cities and small communities can do to mitigate and recover quickly from such damage.

TTC Municipal Forum News

Five forums were held in spring 2006: Denver; Los Angeles; Tacoma, Wash.; Minneapolis; and Dallas. All forums were well attended, with an average of 40 participants. A one-day CIP inspection seminar requested by the Denver forum group attracted 74 participants in May and was presented by Dr. Ray Sterling and Ed Kampbell of Rehabilitation Resource Solutions.

Five forums are scheduled for fall 2006: Denver (Sept. 26); Hillsboro, Ore. (Sept. 28); New York (Oct. 30); and Minneapolis (TBA). Two other forums could not be scheduled before the end of the year and will be held in 2007: Los Angeles (Jan. 11) and Boston (Feb./March, exact date TBA).

Forums are open to public works participants with a \$20 contribution requested for the lunch and other forum expenses. Participants can earn continuing education units if desired.

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