

No-Dig Down-Under 2006: Report-back and comment

by Alaster Goyns, immediate past-president, SASTT

Conference theme

In a nutshell, the *International No-Dig 2006* conference in Brisbane, Australia covered the management of the whole lifecycle of underground assets to ensure their sustainability. This theme was supported by the technical sessions

The opening speaker was Josephine Parker with a paper entitled *Sustainability and social issues: an international perspective*. It emphasised that we can never have sustainable highways and other visible services if we do not ensure that we have sustainable underground services.

Ensuring sustainability is aided by adopting the triple bottom-line approach, namely addressing the social, economic and environmental issues. The economics of the direct activities can be calculated, but putting values to social disruption and environmental damage are difficult issues to resolve. It is estimated that the indirect social costs of installing services via open-cut in congested areas could be between 3 and 4 times the actual direct construction costs. It was even more difficult to put a cost to environmental issues in general terms, as in some cases open excavations could result in permanent damage, such as the disturbance of the local groundwater table.

Technical issues

Training and development

Training and development are seen as crucial to the increased success of trenchless technology in future. The two facets to this were:-

- the external one of educating and training the users and potential users of TT so that they appreciated the technical, social, environmental and economic benefits of using these techniques and were then motivated to implement them, and
- the internal one of educating and training of professionals and operators within the TT industry so that they effectively met the marketplace requirements.

Internationally there is an awareness of the need to get municipal and other utility owners educated in the use of TT. Many of the ISTT members were paying attention to this, but so far there was no coordinated effort between the societies and sharing of information and techniques adopted to make this more effective on an international scale. There is a very real danger that the European, American and other developed societies may prepare promotional material that is too sophisticated for use by the ISTT members in the developing countries. This was raised at the ISTT board meeting and noted as an issue that should be addressed.

With this in mind the standard introductory presentation that has been used at recent SASTT presentations was given to Prof Ray Sterling of Louisiana Tech University, a recent past-president of ISTT, in return for a presentation that he has developed for the same purpose. The scope of his presentation is much wider than the work currently being done in South Africa.

Combining the contents of his presentation with the contents of the roadshow that SASTT has run over the past few years could be a very effective promotional tool.

In Australia professional competency training is provided through approved training providers. This is along the same lines as the national skills development scheme in South Africa. As far as can be established, with the exception of pipe jacking there are no relevant standards, approved courses or certificated trainers to do this in South Africa. Here is another challenge for the local industry.

Directional drilling

The developments in this field are phenomenal. Andrew Lucas of the AJ Lucas Group explained the progress in this industry and the future direction that was being taken. Drill lengths of up to 2700 m and depths of up to 800 m are being achieved. According to Lucas it is not a major challenge anymore to install 2000 m of 1 m diameter pipe.

The HDD industry is looking at what the oil industry is doing, where oil fields are being tapped from the land instead of using oil rigs in the sea. Currently the largest hole is 12,5 km long and 300 mm in diameter. There are several holes of 11 km in length and some that have gone 9 km down. The equipment used for doing this, is the same basic technology as that used by the HDD industry.

Pipe lining-systems

There are many lining systems, but it is clear that spirally-wound and cured-in-place systems are dominating the market for circular pipe. Both these systems are close-fit systems that can be designed to suit the condition of the host pipe and the external loading conditions. Such solutions that can be custom-engineered for a project offer economic advantages without compromising the technical soundness.

It must be stressed that these systems are not an alternative to on-line replacement were the sizes of pipe-bursting equipment and their capabilities have been increased and where HDPE pipe is used almost exclusively.

Another aspect of lining that is receiving a lot of attention is the use of pre-fabricated GRP sheets for large man-entry non-circular conduits. These sheets are made to fit and generally have both horizontal and vertical joints. Once installed, the small gap between the host pipe and the liner is grouted, to eliminate a water path between the two and to ensure that there are no point loadings on the liner.

Dr Dec Downey, the incoming ISTT president, and principal of Jason Consultants gave a paper on GRP linings for both circular and non-circular conduits. The major difference between the two is the installation technique. For circular pipes the CIPP approach is generally adopted; for non-circular conduits prefabricated sheets are used. However, from a structural perspective the same principles apply, namely that the liner has to be designed for the actual loading conditions and for the extent of support offered by the host conduit.

An important factor that is generally overlooked is that, although the materials used for these products are acid resistant they are subject to strain corrosion in an acidic environment. Hence it is essential that such conduits are not subject to excessive strain and that strain-corrosion tests in an acidic environment be done on them to ensure their suitability for particular applications.

Another important factor is to establish the relationship between short-term and long-term structural performance of the products by testing actual samples of the product, rather than choosing an arbitrary number as is done in many of the existing design codes. This involves keeping the samples under controlled conditions and testing them at intervals up to 10 000 hours and predicting the long-term properties on this basis.

Lateral rehabilitation

The junctions between fluid-carrying conduits is frequently a problem area because there are unbalanced hydraulic forces and care is needed to ensure effective soil support around them to prevent movement and consequential leakages. When existing conduits are rehabilitated using trenchless techniques these connections pose an even greater difficulty. They are frequently made by excavating down to them and using conventional methods to install a new junction or connecting piece. This is technically unsound as it is now difficult to compact the soil around this new construction in such a manner that it gives the same support as that given by the consolidated embedment around the straight sections of pipeline.

The trenchless industry has addressed this by the use of robotics and 'top hats'. This works but is costly and does not address the issue of rehabilitating a defective lateral. Recent developments have addressed this and there are now systems available that can simultaneously line the collector sewer and approx 20 m up the lateral. I understand this can be done while the collector is live. Technical details of the system have been requested.

General comments

The ISTT website

Points to note about this website are:

- there is a section for publications that provides contents and reviews and from which the books can be ordered
- a section will be added that will list all the standards related to TT
- the conference papers of *International No-Dig 2006* will be posted on the site.

Attendance

There were 700 delegates and 90 exhibition stands. Just over half of the delegates and the stands were from outside Australia. Even by international standards this was a big show.

It should be appreciated that although Australia has less than half the population of South Africa, it is far more developed. This is particularly evident in the TT industry. ASTT has 86 corporate members and they produce their own quarterly publication *Trenchless Australasia*. The conference edition of this publication was 116 pages.

Future *International No-Dig* conferences

The venues for the next three years have been announced, as follows:

- 2007 Rome
- 2008 Moscow
- 2009 Toronto.

Attendance of the ISTT board meeting

Nearly all the affiliated societies were represented and the views expressed by the various delegates were pretty well consistent. What was of real significance was the general view that there should be more effort towards creating an awareness off TT in the marketplace and then giving the decision makers the tools necessary to make the decisions.

The ISTT employees have been tasked with compiling promotional material and making it available on the ISTT website. It is recommended that SASTT and its members should take every opportunity to keep abreast of these developments. Where feasible and appropriate information published by the ISTT should be extracted and adapted it for use in South Africa.