SHANGHAI MAKES ITS MARK IN TRENCHLESS INDUSTRY

TRENCHLESS TECHNOLOGY HAS BECOME A KEY ASPECT TO THE INFRASTRUCTURE RENOVATION IN CHINA’S INDUSTRIAL CENTER AND WEALTHIEST CITY

By Sharon M. Bueno

Over the next few years, the eyes of the world will be firmly fixed inside China’s borders — in particular, there are two events that country officials point to as keys to its economic future. First, the Summer Olympics are coming to its capital city of Beijing in 2008, and then the World Expo opens for a six-month run in the city of Shanghai two years later.

Beyond these two gigantic and important events, which alone will shine the media’s bright and harsh spotlight on this country, Chinese officials want to entice more business to their country. To accomplish these goals, they must bring their cities into the modern age and open its doors to outside help.

Is the country ready? Specifically, right now, are Beijing and Shanghai ready? The construction industry is booming and covers the spectrum from buildings to pipelines to high-speed railways. Perhaps most importantly, attention is being given to the country’s antiquated infrastructure, which if not properly addressed, could hold back China’s drive to the economic forefront.

More and more companies are doing business with China in recent years and the country continues to climb the economic ladder — it was recently accepted into the World Trade Organization (WTO).

Enter trenchless technology. China has become one of the hot spots for the trenchless world. As the country continues to modernize its water, sewer and telecommunications networks, trenchless products, technologies and techniques have become popular methods of those endeavors. Though in some cases rehabilitation is being used, an overwhelming percentage of the infrastructure needs a complete replacement.

Horizontal directional drilling (HDD). Pipe bursting. Microtunneling. Pipe Ramming. These are all trenchless methods being employed in China.

China was first introduced to trenchless technology in the 1990s as international trenchless leaders brought the technology to the attention of the Chinese government, which tenders the contracts and issued an administrative directive that the technology be employed when possible. Since then, the country has been an economic boon for the trenchless marketplace as an influx of trenchless companies have opened plants, offices and shared their knowledge with the Chinese.

The list of trenchless companies that have worked in China continues to grow as does the number of opportunities. Over the years, prominent companies working in China have included Vermeer Mfg., Herrenknecht, Ditch Witch, Digital Control Inc., American Augers, HOBAS, Barbco Inc., EarthTool, The Robbins Co. and CETCO — and there are many others.

Shanghai
The city of Shanghai is one of the country’s brightest stars — and its wealthiest city. Home to more than 18 million people, the city has been described as China’s industrial base and its financial capital. The city is peppered with high-rise buildings, with plans for more developing every day.
According to the Web site, www.shanghai-ed.com, Shanghai is China's largest city, its largest port and its largest industrial base. The site notes that the city is home to the best shops and restaurants in China and is also known as “The Dragon Head” of East China, the leading economic driving force.

The site further says that Shanghai has the most skilled workforce in the country and has good transportation and communication links. The city is noted for its production of textiles and other consumer products, although many factories are now being shifted to the outskirts of the city or to inland areas. Shanghai is also one of China's top centers of learning and is populated with many universities and institutes including Fudan and Jiaotung universities.

Shanghai’s current water supply network has approximately 7,000 km of pipe, of which more than 800 km has served more than 30 years. More than 5,000 km of the pipe is made of gray cast iron and does not have any anti-corrosion coating, hence the water supply’s quality and assurance are at risk by a multitude of factors such as pipe corrosion and low quality materials.

With its densely populated neighborhoods and business districts, Shanghai is in the perfect position to utilize the benefits of trenchless technologies — most notably its non-disruptive nature and sensitivity to the environment it is working in.

The World Expo comes to Shanghai in 2010 and the city will host millions of visitors from around the globe, most experiencing China and Shanghai for the first time. Shanghai leaders want to make a tremendous first impression. Since awarded the Expo in 2002, Chinese officials have undertaken a massive infrastructure revamping.

Trenchless Technology International contacted a few established and successful Shanghai companies that are involved in trenchless operations in the city: Shanghai Water Special Engineering Co., Shanghai Municipal Gas No. 2 Engineering Co. Ltd. and Shanghai Win-Market Trenchless Technology Engineering Co. We wanted to learn of their perspectives of the trenchless market in Shanghai and their thoughts on the industry as a whole, as well as their contribution to the trenchless market.

**Shanghai Water Special Engineering Co.**

Shanghai Water Special Engineering Co. was founded in 2000 in the Pudong District of Shanghai. A certified pipeline contractor, the company currently employs 122 workers and specializes in several trenchless methods including HDD, pipe relining and pipe cleaning and spraying projects.

Zhu Feng Xiang, general manager of Shanghai Water, says the Pudong District is an excellent location for Shanghai Water. "Pudong, being the fastest developing area of Shanghai, provides the opportunity of both project volume and the potential for growth."

He says that his company primarily does work involving water pipelines but has also done projects for sewer, gas, electrical and fiber pipelines. "We started moving in the trenchless area two years ago," Zhu says. "And now most of our work is trenchless related. The expected growth rate for us is 30 percent per year for the next several years."

The company considers itself very much a leader in the push for trenchless technology in China, noting that it was the first in Shanghai to use no-dig rehabilitation technology in a water system. Zhu sees its role as a leader in trenchless as a key to its continued success. "Our motto is 'leading technology leads the way.' I ensure that we are always at the leading edge of the technology," he says. "The best way to keep up is to be the leader. That's why a tremendous amount of the company's resources is invested in [research and development]."

Shanghai Water Special Engineering has also participated in leading trenchless shows, such as the recent International No-Dig in Rotterdam, where it presented two technical papers on projects it completed, one discussing its patented stainless steel lining for pipe relining. Company officials also plan to participate in the TRENCHLESS ASIA conference in Shanghai in March, as well as the 2006 International No-Dig conference in Brisbane, Australia.

Zhu says the most utilized trenchless method today in China is HDD but sees rehabilitation methods “as the next big thing” to catch on with owners and contractors. “This is especially true for an old city like Shanghai. There are over 7,000 km of water pipes in Shanghai and 5,000 km of those need to be replaced or repaired now,” he says. "It will take all possible means to achieve such a volume. There is no other way but trenchless rehab.”
Using trenchless is critical to the infrastructure’s progression, Zhu says. “The density and population of China’s cities are the perfect case for the use of trenchless technology,” he says. “I cannot imagine how much of a traffic problem we would have created for Shanghai without the availability of trenchless technology.”

Zhu believes that the trenchless market will continue to skyrocket at least until the 2010 World Expo. “But we have more than Shanghai in mind,” he says. “There are hundreds of cities [in China] in which trenchless technology is virtually unknown.

**Shanghai Municipal Gas No. 2 Pipelines Engineering Co. Ltd.**

Shanghai Municipal Gas No. 2 Pipelines Engineering was founded in 1987 in the Pudong District and was established by the Shanghai municipal government as a specialized company for gas pipeline installation and maintenance. A subsidiary of the Shanghai Urban Construction Group, the company is a certified general contractor and a certified pressurized pipeline contractor. It set up business in the Pudong District in order to carry out all gas pipeline-related projects in that district.

The company handles traditional pipeline installation work, as well as HDD, pipe ramming and online gas pipe repair. Wang Zhi Hua with the company says the Shanghai Municipal Gas’s first official entry into the trenchless arena was in 2002 — the year it purchased its first directional drill. “Before that, we had done work using pipe jacking and slip lining,” Wang says. “It was not until 2002 when a major project was carried out by our own people that [HDD] became a daily routine. HDD remains the primary method for most of our trenchless projects.”

Trenchless technology has been the key to Shanghai’s infrastructure improvements, Wang says, noting that the technology is still in its infancy in China. As of 10 years ago, digging was the only way constructing new infrastructure was handled, Shanghai included. “In Shanghai, we have completed most of the infrastructure and the city is, at least at the surface, a modern city,” Hua says. “Today with most of the aboveground infrastructure in place, there is no room for digging. The only way to install and improve underground pipelines is to go trenchless... With the use of trenchless technology in Shanghai, it would have delayed development of our underground infrastructure or put the whole city into a halt as a result of digging.”

Wang credits the Shanghai municipal government for recognizing the need for using trenchless technology and opening the doors for its use. HDD is by far the most used technology, although it does have its limitations with China’s use of concrete pipes.

"In the past years, most of the use of trenchless technology in China has been for new installation and that is why we see the tremendous growth of using HDD,” Wang says. "In the coming years, there will come the time for rehabilitation methods. I expect to see the rapid growth and requirement for rehab methods such as slip lining and CIPP.”

Like Zhu, he notes that though trenchless is being utilized in the more recognized cities such as Shanghai, Beijing and Guangzhou, it is still relatively unheard of in most cities in China. “If one would look at China as a whole, [the word] infancy is absolutely an understatement,” he says.

Wang also believes that networking at international trenchless conferences is vital to the growth of trenchless technology in China. The company has participated in the TRENCHLESS ASIA shows, as well as other international gas industry shows. “I believe it is important for a company like us in such a high growth market to be active in industry events,” he says. “We need to be more active in the international arena. There is so much we can learn from our international colleagues.”

**Shanghai Win-Market Trenchless Technology Engineering Co. Ltd.**

Shanghai Win-Market Trenchless Technology Engineering Co. was established in 2002 as part of the municipal government’s administrative directive for contractors to employ the use of trenchless technologies. Zhao Jian Ping, who had a background in drinking water and electrical components, and his partners saw an exciting opportunity and started the company. Today, it employs 150 people and has completed more than 100 projects over the last three years.

The company’s management office is located in the Puxi District of Shanghai, whereas its warehouse and workshop are located in the Minhang District. Its main work product involves mostly power cable but Shanghai Win-Market has also done work on water pipelines, gas, fiber cable and sewer. “We are active in almost every sector of underground pipe,” Zhao says. "We are partners with the Shanghai
Municipal Power Co. so most of our work is done in the metropolitan Shanghai area and mostly for power cable. Due to our reputation in carrying out complex and difficult projects, we have been called upon to attack major projects in Guandong, Zhejiang and Nanjing.”

Zhao describes the amount of incomplete infrastructure work in China as “mind boggling,” and adds, “It is the central government’s policy to use infrastructure growth to lead the economic growth. We can expect a high growth rate in this sector for many years to come. Trenchless technology will play a very important role in this, especially in the urban areas.”

Shanghai Win-Market utilizes HDD in its projects and recently completed a record crossing in Guangdong where a 1,600-m river crossing was done using 219-mm pipe, Zhao says. But the company is more than just a contractor; it has developed its own back reamers, as well as a special grouting formula that has proven to be effective for working in the soft soil conditions of Shanghai. Zhao also notes that the company is in the process of starting a division for tunneling and rehabilitation.

With the HDD method firmly in use in China, Zhao sees the development of other trenchless applications on the horizon. But more than just implementing trenchless methods, Zhao says that it is also important that China focuses on damage prevention issues for all trenchless applications. The company also participates in the TRENCHLESS ASIA shows, as well as the other established national and international trenchless conferences, with its leaders understanding the importance of learning from others.

"I am just proud that I decided to join the trenchless community,” Zhao says. “It is impossible to comprehend how the citizens of Shanghai would have suffered if many of our trenchless projects were completed by open-cut. [Shanghai Win-Market] went from knowing nothing to being an expert in the field in three years. It takes a lot of hard work to keep up. Foresight is the key and resources are also important. We have invested millions of dollars in equipment and training. Another key to our success is to develop our own technology so others would have to try to keep up with us.

“The challenges are plenty, both external and internal,” Zhao continues. “The fun of business is facing challenges and conquering them. We are ready."

Sharon M. Bueno is managing editor of Trenchless Technology International. Derek Choi, a member of the executive sub-committee of ISTT and is also the international director of CHKSTT, assisted with the interviews/photography.

Useful links:

**CSSTT**  China Shanghai Society for Trenchless Technology (in Chinese only)

**CHKSTT**  China Hong Kong Society for Trenchless Technology

**CSTT**  China Society for Trenchless Technology