



Sewer Construction With Water Jets

Water jets are being used in the construction of a 3700-foot-long storm sewer in St. Paul, Minnesota. This sewer is being constructed in the St. Peter Sandstone, a soft sandstone which is amenable to water jet cutting. The nature of this rock has allowed the contractor, Lametti and Sons of Hugo, Minnesota, to replace conventional tunnelling methods with more precise and cost effective water jetting methods using equipment purchased from Jet Edge Inc., also a Minnesota based company.

Guy Larson, who directs the operation for Lametti, learned that water jet technology was used to cut concrete. He had a hunch that it could be used in the St. Peter sandstone and after some refinements in technique decided to try it. The results have been very satisfactory.

Lametti uses a 10,000 psi, 18 gpm water jet to cut a two-inch-wide slot around the periphery of the tunnel extending four to eight feet into the rock face. This slot outlines a cathedral-shaped block of sandstone 11 feet high at the peak (Figure 1). Water jets are then used to drill three blastholes into the cathedral-shaped block of rock.

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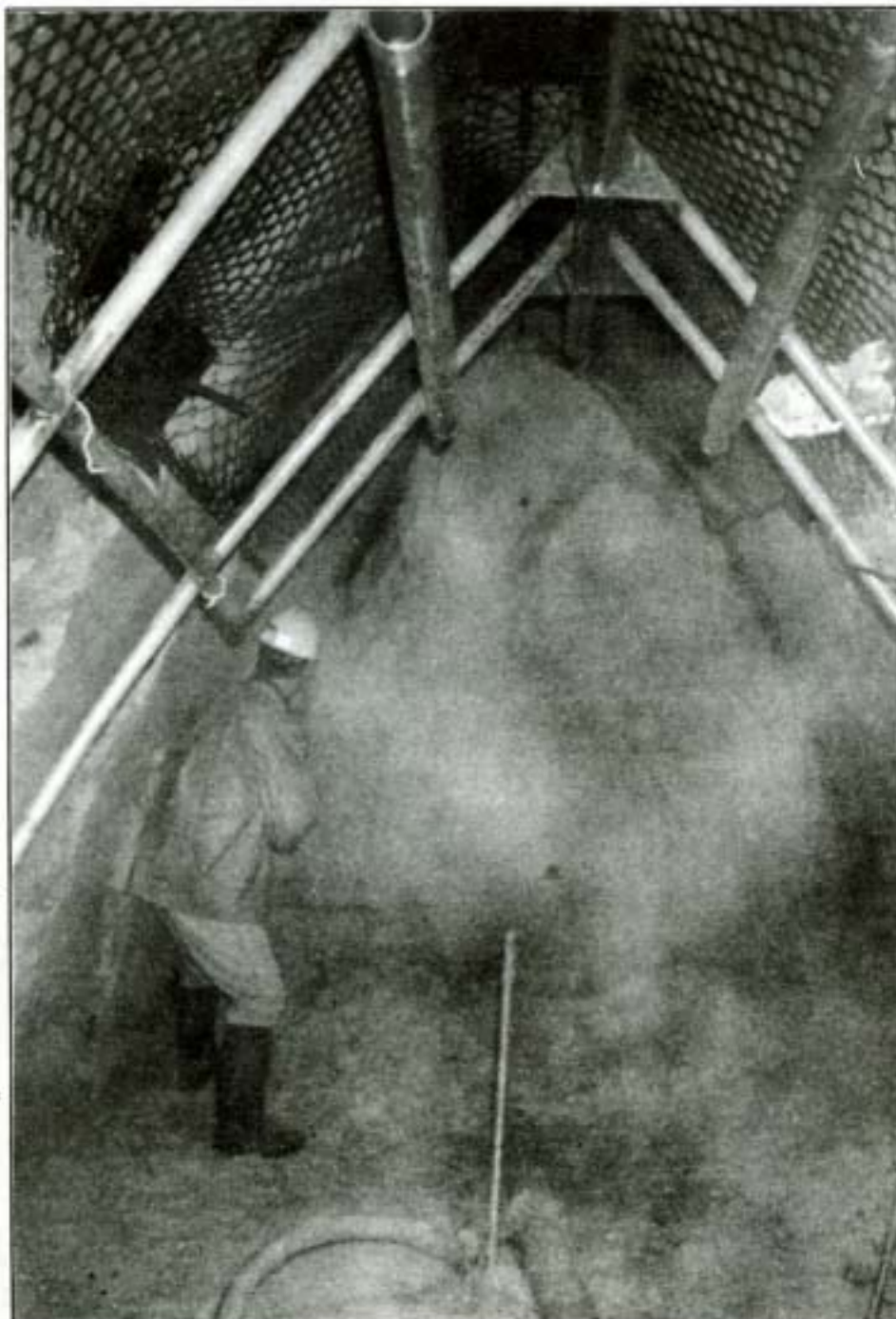


Figure 1. Cutting slots in a sandstone face of a tunnel.
Photo courtesy of Lametti & Sons, Hugo, Minnesota.

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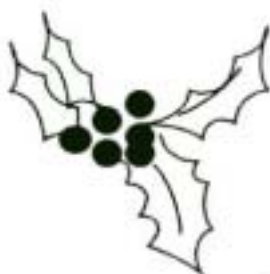
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**Happy Holidays
and Best Wishes
for a Healthy and
Prosperous
New Year from the
WJTA Officers,
Board of Directors,
and Staff**



Thomas Kim Named New Engineering Dean

Thomas Kim, a member of the Water Jet Technology Association Board of Directors, has been named Dean of the University of Rhode Island College of Engineering. The announcement was made by President Robert L. Carothers and Provost M. Beverly Swan. Kim, who has served as interim dean since August 1991, assumes the post immediately.

URI President Robert L. Carothers commented on the appointment that "Tom is a person of boundless energy and good will. He commands the respect of both the academic and professional communities of engineers, something we came to understand more fully during his stint as interim dean. I am gratified that our long search concluded with Tom Kim in this critical role."



Thomas Kim

Dean Kim's primary responsibility will be the management of the College of Engineering's six academic departments, which include chemical, civil and environmental, electrical and computer, industrial and manufacturing, mechanical and applied mechanics, and ocean engineering, as well as the college's four research centers. He also will oversee 1,000 undergraduate and 300 graduate students, 75 faculty members, and over \$6 million in externally funded research awards.

As interim dean, Kim has spearheaded the College of Engineering's five-year, \$15 million capital campaign goal to establish endowed professorships, fellowships, scholarships, and funds for facilities and equipment. In the first two years of the campaign, \$3.5 million already has been raised.

Kim also revitalized the NSF Industry/University Cooperative Research Center on Thin Film and Interfacial Research – operated jointly with Brown University – by reorganizing the operating structure of the center, assisting industrial fund raising efforts, and initiating the relocation of the Perkin-Elmer surface analyzer system from Providence to URI.

Kim was the chairman of the College's Department of Mechanical Engineering and Applied Mechanics from 1979 until his appointment as interim dean. He launched URI's High Pressure Waterjet Research Lab in 1984 with grants and contracts from Flow International and ASEA Robotics and has conducted waterjet research for TRW Aircraft Components Group, Dow Chemical, GMF Robotics, Barton Mines Corporation, and the U.S. Department of Transportation.

The University has honored Kim three times. He has received a Tau Beta Pi Award for Teaching Excellence, an Outstanding Administration Achievement Award, and a Royal Wales Award for Engineering Excellence.

Water Jetting Publications Available

Proceedings of the 7th American Water Jet Conference, a two volume set, soft cover, over 900 pages long. Includes a compilation of 71 papers, including photos and illustrations, presented at the Conference.

Fluid Jet Technology – Fundamentals and Applications, Second Edition, newly revised and updated. Ten chapters cover the basics of water jetting technology.

To order or obtain additional information contact the WJTA office by telephone at (314)241-1445 or fax at (314)241-1449.

Flow Introduces Upgrade To A-Series Table

Flow International Corporation has introduced an upgraded version of its A-Series shape cutting machine tool. The new A-Series table comes equipped with an Allen Bradley 9/Series controller for improved performance and ease of use.

The new controller provides sharper images and more detailed graphics than controllers used on previous models. Operators can adjust their view of a part on the screen, obtaining both close-up and wide-angle shots. Another feature allows operators to edit a program while the ultrahigh-pressure waterjet concurrently cuts parts based on a separate program. New on-line help options further enhance ease of use.

Performance benefits are achieved through the faster servo response loop of the 9/Series which improves the A-Series' shape cutting capability and accuracy. The controller is built around a 32-bit processor that increases response time compared to the previous model's 16-bit processor.

FLOW improved operator access to the cutting area by redesigning the configuration of the table's Y axis. The new design decreases the amount of machinery between the operator and the cutting area. This enables operators to easily reach parts in the cutting area when the ultrahigh-pressure waterjet is not in use.

Options for the new A-Series include 360 degree wrap-around bellows, providing environmental protection for the hardened linear ways and ball screw mechanics.

For additional information, contact: **Chip Burnham, Director of Engineering, Flow International Corporation, (800)446-3569 or (206)850-3500.**

The *Jet News* is published by the Water Jet Technology Association (WJTA) and is a benefit of membership in the Association.

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7th American Water Jet Conference Highlights

There just wasn't enough space in the October/November issue of *Jet News* to include all of the photographs taken at the 7th American Water Jet Conference held August 28-31 in Seattle, Washington.

Here are more Conference highlights for your enjoyment.



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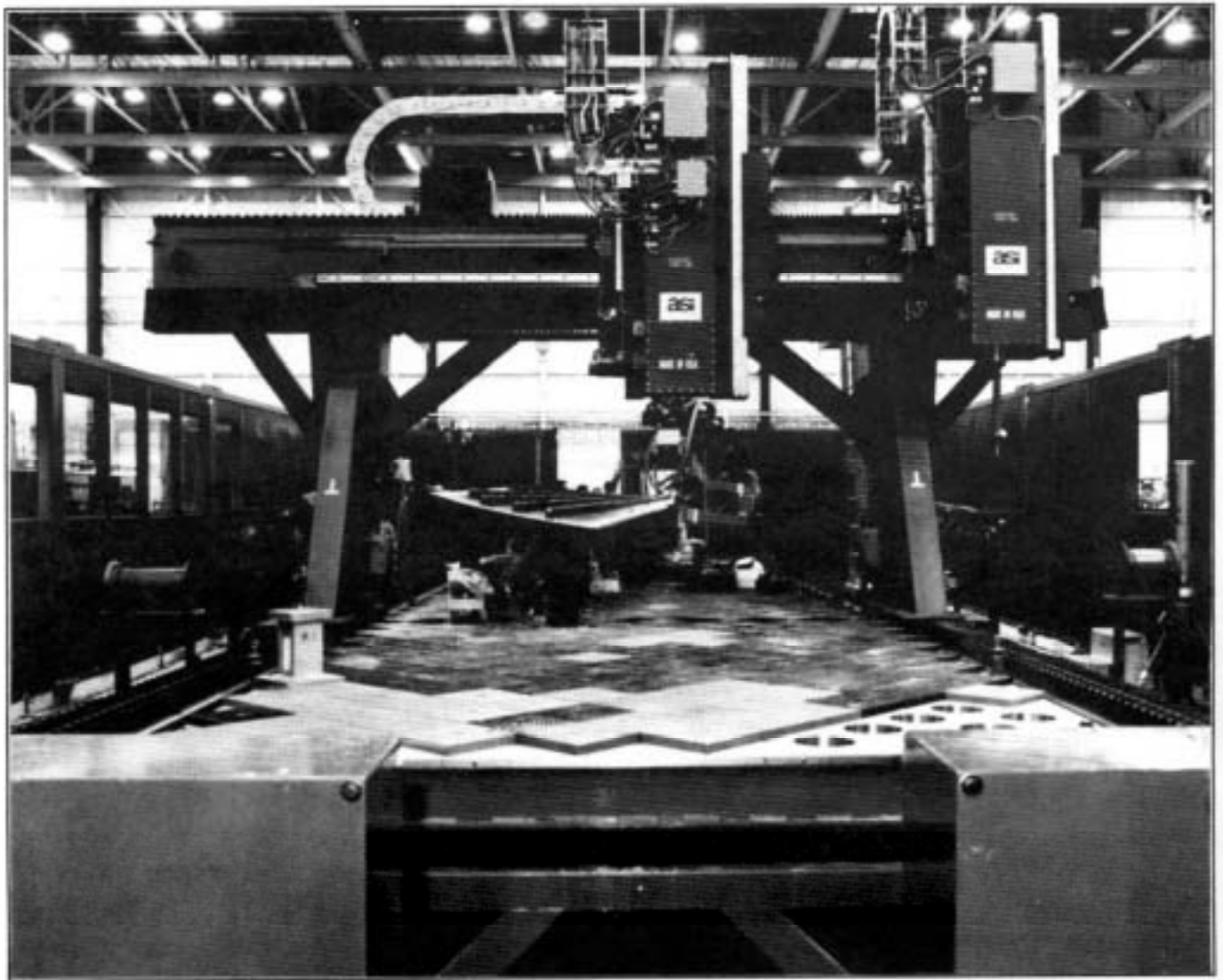
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Advanced abrasive jet system for composite machining used in aircraft structures. Photo courtesy of Boeing Manufacturing R&D and ASI Robotics.

Sewer Construction with Water Jets, from page 1

These holes are loaded with explosives and the rock is blasted. The perimeter slot serves as a buffer zone to isolate the effects of the blast to the rock inside the perimeter and to prevent damage to the surrounding rock.

Next, a mucking operation begins, which also is based on water jet technology. A water jet is played onto the muck pile created by the blast. This jet breaks the sandstone fragments into individual sand grains in a 30% slurry. This slurry is drawn into a jet pump which feeds the slurry into a slurry pipeline. This pipeline transports the sand to a settling pond at the surface. Here all sand and suspended fine clay is removed from the water.

After excavating the sandstone a seven-foot-diameter concrete tunnel liner is cast in place.

Because the excavating equipment used is smaller and more versatile than conventional mechanical equipment, maneuverability is greatly increased. At two points, a 43-degree turn in the tunnel was easily handled with the resultant savings of \$350,000 for what would have been required for costly surface-to-tunnel shafts to lower necessary equipment to the job site.

While total savings resulting from the use of water jet technology on this job have not been established, Lametti's closest competitor bid more than 112% higher on the job. This gives something of an indication of the advantage of water jet technology in this situation and the efficiency of Lametti and Sons.

The Cutting Edge



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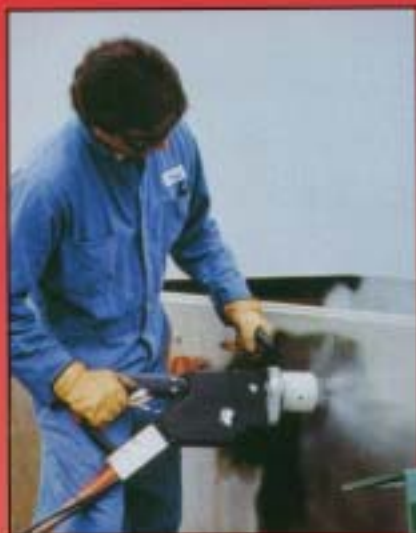
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Terry Alkire To Head Flow European Sales And Marketing



Terry Alkire

Flow International Corporation has named Terry Alkire as vice president, European sales and marketing. Alkire will head sales and marketing operations from FLOW Europe's headquarters in Darmstadt, Germany.

Alkire's responsibilities will entail direct management of FLOW's branch sales operations in Germany, France, Italy and the United Kingdom. In addition, he will lead sales and marketing operations in Eastern Europe, Africa and the Middle East.

Previously, Alkire served as director of Flow International's Environmental Products Group at FLOW's headquarters in Kent, Washington. As director, he assisted in the introduction of FLOW's successful HUSKY™ pump, and helped strengthen the company's position in the growing environmental services market. Alkire has also worked in several sales and marketing positions at FLOW Europe.

In addition to his native English, Alkire speaks fluent German, French, Italian and Spanish. Alkire received his bachelor of arts in Spanish from the University of Montana. He obtained an MBA in management of engineering and high technology from City University, Frankfurt.

Contact: Terry Alkire, VP,
European Sales and Marketing,
FLOW Europe, 011-49-6151-88.

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Conference Highlights from page 4



Dr. Glenn W. Howells offers a toast to the success of the Water Jet Technology Association.



Professor Mamidala Ramulu



Dr. and Mrs.
Mohamed Hashish



Dr. Andrew Conn

More About WJTA Founders

In the last *Jet News* we published a picture of six of the founding members of the WJTA. We incorrectly identified Dr. David Eddingfield as the WJTA's first secretary. Dr. Eddingfield was the treasurer and Robert Evans was the secretary.

We also failed to mention several other participants in the first meeting of the WJTA, which was held on May 24, 1983, in Rolla Missouri.

In attendance were:

Dr. Andrew Conn
Dr. William Cooley
Pat DeBusk
Dr. David Eddingfield
Robert Evans
Howard Handwith
Mike Hood
Doug McCombs
Larry Pater
Dr. James Riechman
Roger Roether
Dr. George Savanick
Al Savernein
Dr. David Summers
Jim Thomas
Doug Uthus
Dr. Fun-Den Wang
John Wolgamott
Mike Woodward
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One brave soul attempts the limbo - he made it, too!



See you at the JW Marriott Hotel in Houston, Texas, for the
8th American Water Jet Conference, August 25-30, 1995!

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We at Phillips Machining are thankful and grateful for our many customers and friends around the world who have helped us to prosper and grow. We wish you all a Merry Christmas and a very Happy New Year!

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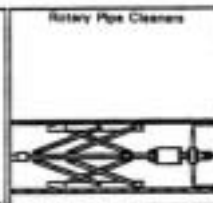
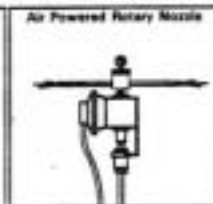
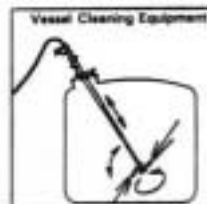


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