

# InfraStructures

**CONSTRUCTION • PUBLIC WORKS • NATURAL RESOURCES**

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THIS ELECTRONIC VERSION OF INFRASTRUCTURES IS MADE AVAILABLE FOR THE SOLE PURPOSE OF GIVING OUR ENGLISH SPEAKING READERS A TASTE OF THE ORIGINAL PRINTED VERSION OF THE MAGAZINE.

WE WILL TRY TO PUBLISH AS MUCH OF THE EDITORIAL CONTENT OF THE PRINTED VERSION AS POSSIBLE GIVEN THE TECHNICAL LIMITATIONS.

## Welcome

Throughout its eight years of serving the French speaking users of heavy machinery and specialized equipment in Canada, InfraStructures has established itself as the most acknowledged reference in its field. All other magazines have a different scope or focus. None offer a better mix of local content, important industry news, good circulation and reasonable rates for both readers and advertisers.

As you may know, our next major step for 2005 is in the making: an English print version of InfraStructures – distributed by mail across Ontario and the Maritimes. If you are interested in receiving the English print version of InfraStructures next year, please send us your coordinates by mail or e-mail.

For the year 2004, issues of the English online version will feature more content than last year. We encourage you to send in your news releases and articles which we will gladly publish free of charge.

Finally, we offer a great advertising package: Buy space in our French print version and get published in the English online version free of charge. Please call us to discuss your advertising plans in detail.



Publisher/Editor

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On the front cover : A Terex TH1056C Rough Terrain Telescopic Boom Material Handler used by Entreprises Rocan Inc. on the construction site of the new fruits and vegetable wholesaler J.B. Laverdure Inc. in Montreal.



## In the News...

### CANAM STRUCTAL AWARDED A US\$18 MILLION STEEL CONTRACT FOR 28-STORY PHILADELPHIA OFFICE BUILDING

Structal, the heavy structural steel division of Canam Steel Corporation, has been awarded an US\$18 million contract to supply steel for the 28-story Cira Centre office building in downtown Philadelphia.

"The contract, with general contractor

Turner Construction Co., includes the supply, fabrication and erection of the structural steel for a building in the re-development area near the downtown railroad station", said Charlie Watson, president of the Structal division in the U.S.

A total of 8,050 tons of structural steel and metal deck will be manufactured for the building, beginning in March with completion of delivery and erection of the material in the fall of 2004.

The building will total 784,000 square feet when completed and is part of the city's Keystone Opportunity Zone revitalization.

Canam/Structal has completed several projects with Turner Construction, the nation's largest builder. The most recent project was to supply and erect steel for the new Philadelphia Eagles Lincoln Financial Field, as well as the construction of the Nationwide Arena in Columbus in 1999.

Structal is the heavy structural steel division of The Canam Manac Group, Inc., an industrial company with 18 steel component, semitrailer and forestry equipment fabrication facilities. The company employs more than 4,000 people in the United States, Canada, Mexico, Romania and India.

Source: The Canam Manac Group

### SNC-LAVALIN SIGNS FOR N-PARAFFIN & LINEAR ALKYL BENZENE PROJECT IN SAUDI ARABIA

SNC-Lavalin is pleased to announce that it has signed agreements with Gulf Farabi Petrochemical Company Limited in Saudi Arabia to execute an n-Paraffin and Linear Alkyl Benzene (LAB) Plant Project in the Kingdom. The project has a capitalized value of Saudi Rial 1218 million (US \$338 million).

SNC-Lavalin will provide engineering, procurement, construction management and commissioning services for the project.

"The selection of SNC-Lavalin is a perfect fit for this project, given our expertise in designing and building n-Paraffin and LAB Plants," said Krish Krishnamoorthy, Executive Vice-President, SNC-Lavalin.

Once completed, the plant will produce 120,000 tonnes per annum ("TPA") of n-Paraffin and 70,000 TPA of LAB.

n-Paraffin is prepared from kerosene, and then used to produce LAB, the basic raw material for detergents. The plants will be located adjacent to the existing Saudi Aramco Shell (SASREF) Refinery at Al-Jubail, which will supply the kerosene for the n-Paraffin production.

"SNC-Lavalin's ability to offer international clients a wide range of global complementary expertise is one of our key strengths," added John Hutchinson, Senior Vice-President & General Manager, Chemicals and Petroleum International Business Unit of SNC-Lavalin Inc. "SNC-Lavalin's joint venture office with Saud Consult in Al-Khobar, Saudi Arabia will also be making an important contribution to the success of this project."

The plant is scheduled to begin commer-

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cial production of products in the first quarter of 2006.

SNC-Lavalin (TSX: SNC) is one of the leading groups of engineering and construction companies in the world, a global leader in the ownership and management of infrastructure, and a key player in facilities and operations management. The SNC-Lavalin companies have offices across Canada and in 30 other countries around the world and are currently working in some 100 countries.

Source: SNC-Lavalin

#### **SIX STEEL FABRICATORS HONORED AT STEEL PLUS NETWORK CONVENTION**

Steel Plus Network presented its 2003 achievement awards to six members at its ninth Annual Convention held last month.

Six North American members of Steel Plus Network were honored during the event. ACL Steel Ltd., of Breslau, Ontario, received the Fabricator Member of the Year Award. Flexalloy, Textron Fastening Systems, from Indianapolis, Indiana, was named Supplier Member of the Year. Ritner Steel, Inc., of Carlisle, Pennsylvania, was awarded both the Project of the Year and The Steel Plus Technology User of the Year Award. Irongate, Inc., of White Post, Virginia, received the Rookie of the Year Award.

The Bob-Coffey Award was presented to Kenneth Ballweg, of Endres Manufacturing in Waunakee, WI. This special achievement award is named after the vice president and general manager of the Canam Steel Corporation plant in Sunnyside who passed away in 1998 and who actively contributed to the expansion of Steel Plus Network. Mr. Ballweg was recognized for his exceptional contribution to the development of the steel industry, involvement in his community and for promoting networking within the business group.

"The achievements of the members earning these awards are typical of the leadership qualities we have in our organization," said Pierre Arcand, President of Steel Plus Network. "The quality projects and characteristics of our member companies are the strength and the future of this group."

Steel Plus Network, a division of The Canam Manac Group, offers competitive advantages to its members through an expanding purchasing group and a range of products and services.

Source: Steel Plus Network

#### **GTI TESTS ARE PROMISING FOR LOW-EMISSIONS ENGINE TECHNOLOGY**

Independent testing performed by Gas Technology Institute (GTI) confirmed that the GreenGuard emissions control system for natural-gas-fueled reciprocating engines, a product of Attainment Technologies LLC, can significantly reduce nitrogen oxides (NOx) and carbon monoxide (CO) exhaust emissions levels to meet California Air Resources Board (ARB) 2007 requirements.

Results from tests on an 820-kilowatt (kW) engine have researchers optimistic that, through further development and validation, the emissions reduction technology can be integrated into future reciprocating engine-based distributed energy (DE) and combined heating and power (CHP) applications.

"As part of GTI's strategy for developing low-emissions, high-efficiency, packaged DE and CHP systems," says John Kelly, GTI's Executive Director, Distributed Energy

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Applications Center, "we're looking at the GreenGuard system to bring packaged CHP systems into compliance with stringent emissions regulations, typical in regions throughout California, at a capital and operating cost much lower than conventional reduction techniques. Our tests indicate that the GreenGuard system can achieve significant emissions reductions for lean-burn engines."

GTI performed emissions testing across a range between 50-percent and 100- percent

rated output (400 kW -- 820 kW). Corrected NOx concentration levels were less than three parts per million (ppm) with CO concentration levels below four ppm at a reference oxygen level of 15 percent.

"Lean-burn reciprocating engines offer the highest prime-mover efficiency for gaseous fuel-based DE systems currently commercially available," notes Kelly. "However, the best non-treated exhaust emissions levels achievable today are in the vicinity of 1.7

pounds per megawatt hour (lb/MW hr). California, Massachusetts, and Texas, however, all require exhaust stack NOx emissions levels of approximately 0.5 lb/per MW hr or less. In 2007, California will reduce this to 0.15 lb/MW hr."

Kelly adds, "A three ppm NOx emissions level for a lean-burn engine is more than a 95 percent reduction over today's best lean-burn, untreated emissions levels. This technology will allow lean-burn reciprocating engines to meet the lower emissions regulations at approximately half the cost of selective catalytic reduction."

GTI is scheduled to work with Attainment Technologies to test the GreenGuard system and to integrate this technology into packaged DE and CHP units.

GTI is the leading research, development and training organization serving energy markets. GTI is dedicated to meeting the nation's energy and environmental challenges by developing technology-based solutions for consumers, industry, and government.

Source: Gas Technology Institute

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### **ALSTOM TO SUPPLY TURBINE RUNNERS TO GLEN CANYON DAM, USA**

Alstom has been awarded a contract, valued at around \$25 million US, by the US Bureau of Reclamation for the supply and installation of 8 x 169 MW Francis turbine runners for the Glen Canyon Dam, located on the Colorado River in the State of Arizona. Scope of supply also includes wicket gates, stationary wear rings and other equipment.

Design and engineering for the turbine runners will begin shortly, with manufacturing of the first unit scheduled for the latter part of 2004. Installation of the 8 units will take place between 2005 and 2013.

Alstom's North American Hydro unit in Denver is responsible for the management and execution of the project.

Source: Alstom

### **HOUSING ACTIVITY EXPECTED TO SOFTEN BUT REMAIN STRONG IN 2004**

More than 250 people from all areas of the housing industry attended Canada Mortgage and Housing Corporation's (CMHC) Housing Outlook Conference last month at the Casino Nova Scotia Hotel. Developers, builders, renovators, real estate agents, mortgage specialists and many other housing professionals gathered at this event to listen to CMHC market analysis experts share their latest insight into the region's economic and

housing markets. The theme for this year's conference was "Adjusting the Sails: Identifying Opportunity in the Housing Market."

Alex MacDonald, Regional Economist for CMHC's Atlantic Business Centre, highlighted the current trends in the Atlantic Canadian economy and housing market. He said that housing starts activity would remain strong in 2004. "The total number of starts will soften in 2004 in Atlantic Canada, although activity will remain at an above average pace of construction for both singles and multiples," explained Mr. MacDonald.

David McCulloch, Senior Market Analyst for CMHC's Atlantic Business Centre, provided a detailed forecast for the Metro Halifax housing market and the Nova Scotia market overall in 2004-2005. "Home ownership demand in Metro Halifax is expected to soften over the next 18 to 24 months and this will result in declining sales of existing homes and lower levels of residential construction. However, this is a normal part of the housing market business cycle and since these declines are from record levels of activity, the market will remain resilient by historical standards before it resumes a growth trend again in late 2005," said Mr. McCulloch.

Guests also had the opportunity to listen to Avi Friedman, Professor of Architecture at the McGill University School of Architecture, speak about the ongoing evolution of home and community design in Canada.

The Conference was sponsored by Greater Homes Incorporated and First Canadian Title.

Source: Canada Mortgage and Housing Corporation

#### LAFARGE NORTH AMERICA MARKS 20 YEARS OF TRADING ON THE TORONTO STOCK EXCHANGE

Lafarge North America Inc. (NYSE: LAF; Toronto), the leading supplier of construction materials in the U.S. and Canada, announced that Philippe Rollier, president and chief executive officer, has celebrated 20 years of trading on the Toronto Stock Exchange at the TSX Broadcast and Conference Centre and has opened the Exchange with Barbara Stymiest, chief executive officer of TSX Group, on Friday, February 20 at 9:30 a.m.

"Lafarge North America is proud to be listed on the Toronto Stock Exchange and to commemorate its anniversary," said Rollier. "Twenty years on the Exchange is a great achievement and a testament to the growth and performance of our company. I thank the employees of Lafarge for the role they

have played in our accomplishments over these years and the role they will continue to play in making the next twenty years even more successful."

Joining Rollier and Stymiest for the commemorative ceremony will be Larry Waisanen, executive vice president and chief financial officer of Lafarge North America. In recognition of the 20-year milestone, Rollier will present the Exchange with a statuette created from Tercem 3000(TM) cement. The

product, developed by Lafarge's Montreal research center and manufactured in St-Constant, Quebec, is known for its strength and durability.

With origins in Canada, Lafarge North America's history dates back nearly 100 years. Through a series of mergers and acquisitions, the company expanded into the United States, and went public in 1983 as Lafarge Corporation. In 2001, the company was renamed Lafarge North America.

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Headquartered outside of Washington, D.C., Lafarge North America employs 15,500 people who work at approximately 1,000 Lafarge locations across the United States and Canada.

Lafarge North America is the U.S. and Canada's largest diversified supplier of construction materials such as cement and cement-related products, ready-mixed concrete, gypsum wallboard, aggregates, asphalt and concrete products. The company's

materials are used in residential, commercial, institutional and public works construction across the U.S. and Canada. In 2003, net sales exceeded \$3.3 billion.

Source: Lafarge North America Inc.

#### FEDERAL INFRASTRUCTURE PROGRAM HELPS SMALLER CITIES AND THE ENVIRONMENT

The Honourable Andy Scott, Minister of State (Infrastructure), last month announced

negotiations with each province and territory on new agreements to provide Canadians with better public infrastructure. Agreements under the \$1-billion federal Municipal Rural Infrastructure Fund (MRIF) will allow communities - and particularly smaller ones to seek senior-level government funding for important public infrastructure improvements.

"In the Speech from the Throne, the Government of Canada committed to a 'new deal for communities' and to support rural and First Nations community development," said Minister Scott. "Agreements with the provinces and territories will mean modern infrastructure for communities of all sizes."

"The Fund will also support other federal objectives for sustainable development, the environment and climate change," added Minister Scott. "To this end, we have raised to 60 percent the minimum of MRIF funding that targets "green infrastructure". This includes water, wastewater, solid waste, municipal energy improvements, and public transit."

Negotiations will be concluded as rapidly as possible, and the first projects should be announced four to six months following the signing of an agreement with each province or territory. Each jurisdiction will have a set amount of money to fund selected projects. This will also apply to First Nations communities. In most cases, each level of government would contribute one-third of the project costs.

"The MRIF provides a balanced response to locally-defined infrastructure needs, especially in rural Canada. It provides predictable long-term funding," said Minister Scott. "It will also ensure that all Canadians, whether they live in large, small or remote communities can share in the benefits of infrastructure investments. It will build on past successes in partnership infrastructure funding of almost 20,000 projects that are providing Canadians with real benefits through sustainable development."

In addition to green infrastructures, the MRIF will support projects that will help improve local roads; cultural, recreational and tourism infrastructure; and broadband connectivity. The selection of any project will be guided by federal objectives on climate change, water quality, urban life, and innovation, so that Canadians obtain maximum results from infrastructure funding.

The Fund's design has taking into account views of provinces, territories, and municipal associations in order that it be flexible

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and capable of addressing a broad range of municipal priorities. To further respond to municipal concerns, it is proposed that municipal associations have a role of some kind.

With a component targeted to First Nations' infrastructure needs, the Government of Canada further demonstrates its commitment to fostering economic development opportunities and improving quality of life of Aboriginal people who live on reserves. The Fund will do this by stressing investments that improve water quality, stated as a priority in the Speech from the Throne, wastewater treatment and local roads. The First Nations component of the MRIF will be delivered by the Department of Indian and Northern

Affairs.

The Government of Canada acknowledges that long-term infrastructure commitments are key to ensuring that communities, large and small, are competitive and healthy centres for economic growth, innovation and the well-being of all Canadians. Since 1994, it has contributed \$12 billion in infrastructure funding to Canadian communities, which have helped leverage over \$30 billion from all partners.

For more information on the Government of Canada's infrastructure programs, please visit the Web site at [www.infrastructure.gc.ca](http://www.infrastructure.gc.ca)

## SNC-LAVALIN ECS AWARDED A CONTRACT IN TAIWAN

SNC-Lavalin Energy Control Systems Inc. (ECS) and Taiwan-based TECO Electric and Machinery Co. Ltd. recently signed a \$15.4 million contract with the Taiwan Power Company (TPC) to supply, install and commission a new Feeder Dispatch Control System (FDCS) at its Taipei South District Office.

"This new turnkey mandate continues to confirm SNC-Lavalin ECS's position as one of the world's foremost suppliers of energy control systems," said Klaus Triendl, President, SNC-Lavalin International Inc. "It will also provide us with another excellent opportunity to showcase our technical expertise in Asia."

TPC is a government-owned utility and the only power company in Taiwan, supplying power to over 20 million people. The new system will allow TPC to remotely control and supervise its power distribution network in the heavily industrialized southern section of Taipei.

"This is the second contract TPC has awarded SNC-Lavalin ECS, and demonstrates the high level of satisfaction the state utility has in our products and services," said Alain Poplemon, Senior Vice-President and General Manager, SNC-Lavalin ECS. "The new FDCS will improve the quality and reliability of service in southern Taipei, due primarily to the fault detection, isolation and system restoration function developed by SNC-Lavalin ECS." Work began on January 15, 2004, and is scheduled to be completed by December 2005.

Source: SNC-Lavalin inc.

## ADF GROUP CLOSES THE SALE OF ITS FABRICATION PLANT IN SOUTH CAROLINA

Management of ADF Group Inc. announces the closing of the sale of its fabrication plant, located in Columbia, South Carolina (Owen Steel Company Inc.). A private investment company is acquiring OSC. The net proceeds of US\$3.9 million will be affected to the settlement of the debt towards the Bank of Montreal as per the July 21, 2003 forbearance agreement. OSC's local management will stay in place.

Concurrently with the transaction, ADF and OSC have been released of their obligations under the Bank's bridge loan of US\$25 million, which was granted to ADF for the acquisition of OSC in March 2002, and of which as at February 12, 2004, the balance of the loan stood at US\$14.5 million. This



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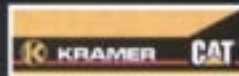
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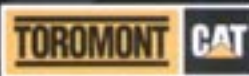
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settlement of the bridge loan was made possible with the collaboration of the Bonding companies. The latter provided the Company a temporary financing of \$2.6 million, which was also remitted to the Bank as a payment toward the debt in order to obtain their final and complete release. ADF will reimburse this temporary financing to the Bonding companies with the collection of certain accounts receivables.

As part of the transaction, the Buyer of

OSC has the right, but not the obligation to exercise an option to require ADF to buyback 50% of its investment in OSC. The Put Option is exercisable during the period between August 10, 2004 and February 10, 2005. In addition, until the date of expiry of the Put Option, ADF may be required to lend, if necessary, up to US\$1 million in working capital to OSC, after the current owner has reached certain financing levels. The total financial commitment of ADF under the Put

Option cannot exceed US\$4 million.

This transaction is an important phase of the restructuring plan of ADF, which focuses on reducing significantly the indebtedness of the Company. In parallel, the Company is pursuing its efforts to keep on respecting its obligations towards the banking syndicate.

Mr. Jean Paschini, Chairman of the Board and Chief Executive Officer has stated "the conclusion of this transaction has been possible thanks to the close collaboration of our bonding companies, the Bank, ADF and the new buyer of OSC. We have worked together to ensure the continuity of this unit and we are pleased that certain jobs will be preserved at this plant".

Mr. Pierre Paschini, President and Chief Operating Officer, added "ADF's restructuring plan is progressing as per our objectives. This transaction represents an important phase of our plan". The operations of ADF are today centralized in its modern Terrebonne facilities, from where the Company is able to undertake the fabrication of complex and large-scale projects.

ADF Group Inc. is a North American leader in the design, engineering, fabrication and erection of complex steel superstructures, as well as in architectural metal work. ADF is one of the few players in the industry capable of handling highly technically complex megaprojects on fast-track schedules in the commercial, institutional, industrial and public sectors.

Source: ADF Group Inc.

#### WESTPORT SIGNS TECHNOLOGY RIGHTS AGREEMENT WITH VOLKSWAGEN

Westport Innovations Inc. (TSX:WPT) announced last month that it has signed an agreement with Volkswagen AG of Wolfsburg, Germany, through its German subsidiary, Westport Germany GmbH. This agreement provides non-exclusive rights to Volkswagen to use one aspect of Westport's combustion performance technology developed for light-duty applications.

Michael Gallagher, Westport's Chief Operating Officer, commented, "We are very pleased to have this technology agreement with Volkswagen, an established leader in the world's automotive industry. We are looking at this as a first step in a long term relationship with Volkswagen, and very much look forward to exploring the opportunities for clean engine technology development and commercialization together."

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developer of gaseous fuel engine technologies. It develops, manufactures and sells a wide range of engines for commercial transportation applications such as trucks and buses through Cummins Westport Inc., its joint venture with Cummins Inc. Technology development alliances are in place with a number of other leading engine manufacturers, including Ford, MAN, Isuzu, and BMW to develop engines that operate using cleaner-burning fuels such as natural gas, propane, hydrogen, and blended fuels such as HCNG.

Source: Westport Innovations Inc.

#### ATLAS COPCO TO ACQUIRE INGERSOLL-RAND DRILLING SOLUTIONS BUSINESS

Atlas Copco AB has signed an agreement with Ingersoll-Rand Company Limited to acquire Ingersoll-Rand Drilling Solutions, a business within the Ingersoll-Rand Infrastructure sector. It has a turnover of approximately 300 million US\$ and 950 employees. The purchase price is 225 million US\$, to be paid in cash. The purchase is subject to various approvals.

Ingersoll-Rand Drilling Solutions is a manufacturer and distributor of drilling equip-

ment and consumables for surface mining and construction, with its head office in Garland, Texas, USA, and production sites in several countries. The business has a leading position within these product areas in the USA and a strong position on many markets elsewhere.

The anticipated acquisition will give Atlas Copco the products to expand in a complementary open pit mining market. It is a strategic move toward making Atlas Copco a leading supplier to the world's largest construction and mining market, the United States.

"Drilling Solutions is a perfect strategic fit, since Atlas Copco is a global market leader in underground drilling, while Ingersoll-Rand is strong in surface drilling, especially in the United States," says Björn Rosengren, Senior Executive Vice President, Atlas Copco Construction and Mining Technique. "The acquisition will give Atlas Copco a more complete product range, stronger aftermarket organization and better geographical coverage, allowing us to meet the needs of the global mining and construction companies better.

What's more, Drilling Solutions employees

have a great deal of valuable knowledge and experience, which complements that of our own people."

A new division will be created within the Construction and Mining Technique business area, with the name Atlas Copco Drilling Solutions. Initially, customers will continue to see the Ingersoll-Rand brand name on Drilling Solutions' products.

Source:: Atlas Copco AB



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# New Enhanced Cab Room Kit Offered by Autocar Dealers

A retrofit kit for Autocar Xpeditor Trucks built before September 2003 allows owners of these trucks to add four and a half inches to the knee room and three inches to the belly room in the cab. The modestly-priced kit can be installed by most mechanics in a few hours.

"The Xpeditor cab has long been known for its comfort and common-sense design," explains Bill Dolesh, vice president, Engineering at Autocar. "However, these extra inches of space allow Xpeditor operators to be even more efficient and comfortable when maneuvering their trucks."

"Suggested fleet pricing for the retrofit kits ranges from \$200 to \$450, depending on vehicle configuration," Autocar Parts president. "With a few hours of labor, a fleet or truck operator can add significant leg and belly room, along with considerable value, to their Autocar truck," he continued.

Autocar is offering 21 versions of the kit to retrofit Xpeditor WX, WXML and WXR models built since 1995 in various configurations.

Key components in the kits include a smaller steering wheel, seatbelts, seat brackets, dash template, trim and complete instructions. Autocar servicing dealership technicians are equipped and trained to install the kits quickly and effectively.

Autocar LLC of Hagerstown, Indiana, is a manufacturer and marketer of low-cab-over-engine (LCOE) class 8 trucks. The company's products are sold into an array of heavy vocational truck markets, primarily in refuse and waste disposal. Autocar is a wholly-owned subsidiary of Grand Vehicle Works Holdings, LLC of Highland Park, Ill.



Autocar Parts, a division of Autocar LLC, is headquartered in West Chicago, Ill. Together with their Reno, Nev., parts distribution center, Autocar Parts has over 145,000 sq. ft. of warehouse space to provide product support to Autocar dealers throughout North America.

Source: Autocar

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# 1954–2004: bauma Celebrates its 50th Anniversary



The success story of the world fair bauma began back in 1954, with 58 exhibitors, 8,000 trade visitors and 12,000 square metres on the open-air site at the old exhibition centre in Theresienhöhe in central Munich. Now, fifty years later, the organiser Messe München sets aside no less than 500,000 square metres of exhibition space for bauma, in the halls and on the open-air site at the New Munich Trade Fair Centre. This makes bauma the world's biggest fair for construction machinery and an international forum for the presentation of the latest building and construction machinery, building materials machinery, construction vehicles and equipment. With the recent addition of bauma mining, bauma is also an important showcase for a wide range of innovative technology in the mining machinery industry.

As it expanded, the world fair bauma kept setting new records. In 1956, the name of the exhibition – 'Building Machinery and Equipment for Use' – was changed to bauma, and in the same year the number of

exhibitors and the total exhibition space doubled. Two years later, in 1958, bauma (now an annual event) featured its first 13 exhibitors from abroad, to coincide with the 800th anniversary year of the City of Munich.

In 1962 bauma moved to the Oberwiesfeld site in the north of the city, to cope with the ever increasing demands for space. The 10th bauma, in 1963, took place right in the middle of Germany's post-war reconstruction boom. The building economy was on a high. 463 exhibitors came to the fair, taking up 112,000 square metres of exhibition space. At this time bauma established itself as the fair it is today – a world fair for construction machinery, building materials machinery, construction vehicles and equipment. Munich, at the heart of Europe, proved to be an ideal venue, and one that had flair and atmosphere.

By 1967 the fair had to make way for the building of the facilities for the Olympic

Games in Munich in 1972, and so it returned to Theresienhöhe and the Theresienwiese. During this time a new chapter opened up for bauma. In 1969 Messe München took over as organisers of the event – which had been started by Karl Rudolf Schulte. At the same time the VDMA, Germany's engineering association, established itself as the conceptual sponsor of bauma.

In 1973 this annual fair was hit by the recession. The next event didn't take place until 1977. In cooperation with the industry and with the VDMA, the frequency of bauma was changed to once every three years. This cycle has proven to be the right one, and it has been retained through to this day. Business picked up and bauma started on

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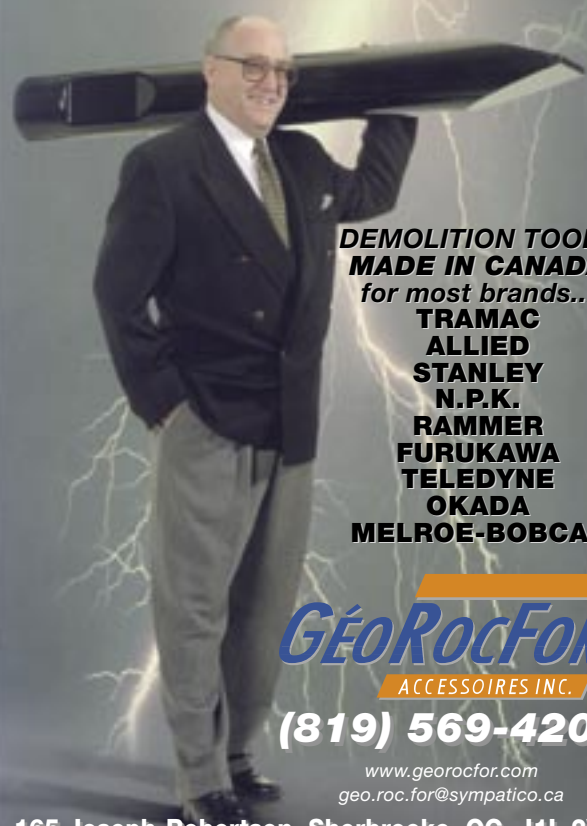


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the hunt for new records. In 1995 it set a new record of 1,700 exhibitors, 350,000 trade visitors from 133 countries, and 405,000 square metres of exhibition space. That was also the last year bauma took place at Messe München's old exhibition site in the city centre. In 1998, as one of the first events at the New Munich Trade Fair Centre, bauma was a resounding success, with new records again being set. In 2001 bauma managed to exceed even those figures – with 2,341 exhibitors and 406,435 trade visitors it was bigger than ever. The proportion of foreign visitors has also grown enormously.

The outlook for bauma 2004, which takes place in Munich from 29 March to 4 April, looks good – new records could be set. 50,000 square metres of exhibition space have been added, bringing the total to 500,000, which would indicate that exhibitor figures could also hit new levels. Also, this year, a new feature has been added – bauma mining – which is a concentrated forum for

the manufacturers and suppliers of mining machinery, taking place under the umbrella of bauma. All around the world the building and construction sector is looking forward eagerly to this jubilee event in 2004. Very soon, the call will be 'Come to Munich – it's bauma time'.

#### bauma + mining

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organiser of the fair, has earmarked 500,000 square metres of exhibition space for bauma 2004 – in the halls and on the open-air site at the New Munich Trade Fair Centre. This will be the biggest bauma so far. New in 2004 is bauma mining, a separate section for manufacturers of mining machinery. For this display, an additional open-air exhibition area is being made available on the north side of the exhibition centre. The last bauma, in 2001, attracted 406,435 trade visitors and 2,341 exhibitors from 42 countries to Munich. The proportion of exhibitors from outside Germany rose by 27 percent. Exhibitor and visitor statistics for the bauma trade fair are examined by an independent auditor on behalf of the Gesellschaft zur Freiwilligen Kontrolle von Messe- und Ausstellungszahlen (Society for Voluntary Control of Fair and Exhibition Statistics).

Source: Messe München International  
bauma + mining 2004  
[www.bauma.de](http://www.bauma.de)

will be on display in Munich from 29 March to 4 April 2004. Messe München GmbH, the

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The system features laser receivers mounted on the blade that automatically control the machine's hydraulic system. A thin beam of light from an off-board laser transmitter provides precise elevation information that is picked up by the receivers. In turn, the blade's lift and tilt are automatically adjusted as the machine moves over the area.

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mation to manually control the blade (typically used in rough grading), or he can switch to the automatic mode for fine grading."

Source: Hewitt Équipement Ltée,  
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# Howard Leight Reinvents Cylinder Earplugs

Product designers at Howard Leight have taken a new approach to the standard cylinder earplug. Combining new material with an entirely new design concept, the new Matrix™ line of single use earplugs offers users a range of benefits, including improved fit and comfort, easier insertion without rolling, and the ability to screen harmful noises out while allowing human voice frequencies in.

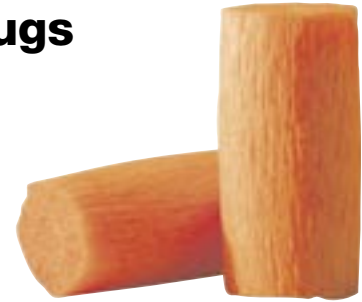
"Matrix earplugs are a quantum leap in single use, cylinder earplugs," said Bill Sokol, VP Strategic Marketing for Howard Leight parent company, Bacou-Dalloz. "They offer a better overall wearing experience than any other cylinder shaped earplug, and are especially well suited for applications that require constant wear and/or communication between employees."

Key to the success of the Matrix plug design is the use of a proprietary thermoplastic elastomer material (TPE) and a patented, dual density foam construction process. Unlike conventional PVC plugs, the center of the Matrix plug is tightly compacted and

much denser than the outer portions of the plug. This results in a semi-rigid core that provides lateral resistance when pushed into the ear. This allows easy insertion without the rolling and waiting for expansion required by traditional cylinder plugs.

The rest of the plug consists of a softer, less dense foam with a smooth outer skin, and a smaller diameter than traditional cylinder plugs, making it extremely comfortable for long-term wear. Industrial users report they do not have to "wait around" for the plugs to expand in the ear canals prior to use, and that the Matrix plugs "feel like they're not even there."

Sokol reports, however, that the best part of the new design is the attenuation profile generated by the TPE foam material. As verified by an independent NVLAP accredited lab, Matrix plugs generate a uniform attenuation profile that has the effect of blocking harmful sound while allowing voices and warning signals to pass through. In field-testing by over 400 real-world users throughout



the US and Europe, this property was enthusiastically endorsed as a major improvement over standard PVC cylinder earplugs.

To suit the needs of the widest range of applications in the worldwide marketplace, Matrix plugs are color-coded for different attenuation levels: Orange colored plugs carry an attenuation rating of NRR 29 db when tested according to ANSI S.319-1974; Green Matrix plugs provide an NRR of 27; and Blue plugs, the lightest attenuation at NRR 23 db. "This prevents overprotection in marginal noise environments," said Sokol, "and allows users to target attenuation, especially in applications where communication is paramount."

Source: Howard Leight Industries



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# Nanofilters Convert River Water Into Drinking Water

By Manfred Kluge  
Richter Chemie-Technik

The world's first and largest nanofiltration plant for treating river water is located in Méry-sur-Oise, north of Paris. The plant is fully automated and the CIP (clean in place) loop for cleaning the membranes runs without virtually any manual intervention. Trouble-free CIP operation is ensured by, among other things, 30 plastic-lined magnetic drive pumps for dosing and conveying the chemicals

Water supplies to the French public are mainly in the hands of private companies. A large share of the market is served by Vivendi, which was founded in 1853.

In the north of Paris, the Syndicat des Eaux d'Ile de France (SEDIF) supplies 39 communities (800,000 inhabitants) from a plant that employs a new and very unique method of treating water from a river source. Located in Méry-sur-Oise, the treatment plant needed to increase production capacity. To do this, SEDIF decided to adopt a technology which had never been used before to treat river water: nanofiltration.

## **BETWEEN REVERSE OSMOSIS AND ULTRAFILTRATION IS NANOFILTRATION.**

Nanofiltration is a membrane liquid separation technology that is positioned between

reverse osmosis (RO) and ultrafiltration.

While rRO can remove the smallest of solute molecules, in the range of 0.0001 micron in diameter and smaller, nanofiltration removes molecules in the 0.001 micron range.

Nanofiltration is essentially a lower-pressure version of reverse osmosis where the purity of product water is not as critical as pharmaceutical grade water, or the level of dissolved solids to be removed is less than what is typically encountered in brackish water or seawater. As such, nanofiltration is especially suited to treatment of well water or water from many surface supplies like rivers or lakes.

Nanofiltration is used where the high salt rejection of reverse osmosis is not necessary. Yet nanofiltration is still capable of removing hardness elements such as calcium or magnesium. Like RO, nanofiltration is also capable of removing bacteria and viruses as well as organic-related color without generating undesirable chlorinated hydrocarbons and trihalomethanes (THMs). Nanofiltration is also used to remove pesticides and other organic contaminants from surface and ground waters to help ensure the safety of public drinking water supplies.

Sometimes referred to as "membrane softening," nanofiltration is an attractive alternative to lime softening or sodium chloride zeolite softening technologies. And since nanofiltration operates on lower pressure than does RO, energy costs are lower than for a comparable RO treatment system.

## **WATER QUALITY GOVERNS TREATMENT TECHNOLOGY**

The location for this unusual plant was chosen because the capacity of the old plant in Méry-sur-Oise had to be increased. Moreover, more effective treatment technol-

ogy was required. Providing more incentive is the increasingly poor quality of the untreated water from the Oise River. The pollution of the water by organic constituents as well as pesticides from agriculture has been rising continuously for years. In 1998 the old treatment plant even had to be temporarily shut down owing to the excessively high TOC (what is TOC) content. It was decided that a membrane processes was an ideal solution for such problematic water treatment.

## **MEMBRANE PROCESSES – EMULATING NATURE**

All known life forms are based on the separation of substances with biological membranes. It is assumed that the membrane processes which occur in nature consume little energy and are extremely efficient. Researchers are trying to understand the processes in nature and convert them into industrial processes with synthetic membranes.

Industrial membranes are filigree structures which largely consist of a multi-layer polymer film with a total thickness of a human hair (approx. 100 µm); the actual active layer only accounts for one hundredth of this thickness.

There is enormous future potential for membrane processes. Their application ranges from the recovery of gasoline vapours through the treatment of acids and alkalis to the removal of alcohol from beer. And the fuel



*The Méry-sur-Oise world's largest nanofiltration plant for treating river water.*



cell is largely based on membrane processes. Certain branches, such as the food industry, the pharmaceutical industry and biotechnology would no longer be feasible without membrane processes.

In principle, all pressure-driven membrane filtration processes (microfiltration - ultrafiltration - nanofiltration - reverse osmosis) involve the water being pressed through a membrane by a transmembrane pressure difference. The membrane then ideally retains all the undesirable water constituents. Which process is used depends on the type and size of the substances to be separated.

Nanofiltration membranes generally carry an electric charge and so special separation problems can be solved, e.g. the separation of molecules of the same size but with different electric charges.

Vivendi's decision to go forward with nanofiltration proved to be correct, as the project manager responsible, Arnaud Douvèneau notes, "Using nanofiltration, our plant in Méry-sur-Oise already satisfies the stringent EU demands placed on the quality of drinking water - and that with a much lower volume of chemicals than in conventional plants."

Equally good results could only be achieved with reverse osmosis but nanofiltration consumes much less energy and is therefore considerably lower-priced. Nevertheless, nanofiltration is not a cheap technology. However, thanks to the use of specially developed membranes for water not containing salt, the throughput in Méry-sur-Oise is substantially higher than with conventional membranes. Moreover, the

operators can run the plant at a lower pressure - and both aspects cut running costs, as Arnaud Douvèneau stresses.



*Plastic-lined magnetic drive pumps from ITT Richter, Kempen, dose the chemicals necessary for the CIP cleaning of the membranes.*

### CLEANING THE MEMBRANES

A major factor for the economic success of nanofiltration in water treatment, is the continuous monitoring and cleaning of the membranes. In Méry-sur-Oise, this takes place in a fully automatic CIP process. Each membrane is equipped with pressure, flow and conductivity sensors. The condition of the membrane surfaces is therefore monitored around the clock. The control takes each of the eight membrane lines

out of production every 8 weeks and initiates the cleaning process which involves acids, bases and detergents.

Dosing out these cleaning chemicals are leak-free, plastic-lined magnetic drive pumps from ITT Richter. ITT Richter specialises in

pumps, valves as well as measuring and control equipment for corrosive and pure media. Although the initial investment costs of magnetic drive pumps are slightly higher than for conventional mechanical seal pumps, the high operational reliability of these leak-free pumps was more important to the operators. And what's more, magnetic drive pumps are more economical in the medium term as there are no mechanical seals and liquid-sealed systems to be serviced and the cost of monitoring is minimal. Douvèneau notes that, "Only

a few staff work in the fully automated water treatment sector. The reliability of the pumps must therefore be ensured in the long term."



*Project manager Arnaud Douvèneau is counting on a new type of membrane in the nanofiltration plant in Méry-sur-Oise.*

Pumps for conveying corrosive, toxic or otherwise critical media are subject to particularly stringent standards as regards operational reliability, sealing against the atmosphere and service life - especially in the environment of drinking water treatment. The high demands were also an important reason for the operator to install Richter sealless pumps and in particular magnetic drive pumps.

In addition to the positive experience in the old plant sector, the decisive factor for placing the order for the CIP dosing pumps with Richter was mainly a technical characteristic of the MNK pumps: They are suitable for dry-running thanks to a special plain bearing concept. The plant staff needs to completely empty the CIP lines for safety reasons and for this purpose the installed pumps must run dry briefly from a certain point in time.

Richter's "SAFEGLIDE" bearing system prevents damage to the pump even if it runs dry for several minutes or there is a shortage of lubrication.

With the technology installed in Méry-sur-Oise, Vivendi satisfies the requirements of SEDIF as regards the security of supplies and drinking water quality. Arnaud Douvèneau notes that, "We are demonstrating with this plant what the state of the art is today in drinking water technology. Roughly 800,000 people in the Ile de France region obtain particularly high-quality drinking water - which is also demineralised." Naturally, such a quality has a price: The plant cost roughly 1 billion French Francs (\$ 150 million). But the advantages speak for themselves: People receive drinking water without any taste of chlorine - and a soft water which no longer causes any scaling problems in home plumbing.



# Flygt Submersible Pumps Dewater Construction for Gas Pipeline

In the Grand Banks region of the North Atlantic Ocean, located 300 km east-south-east of Halifax are the crescent-shaped sand dunes of Sable Island. Home of the wild Sable Island ponies, it has also been a temporary home for shipwrecked sailors, en route convicts, and pirates brought there inadvertently by the legendary gales that blow around the island. Sunken ships litter the surrounding ocean floor, giving the island its reputation as "the Graveyard of the North Atlantic."

There is also a great deal of natural gas around Sable Island, which is gaining a reputation as an important spot for gas production. Combining that source of clean burning energy with high demand from eastern Canada and the United States was the driving force behind building a new natural gas pipeline. The pipeline project will transport this natural resource, which is estimated at 412 billion m<sup>3</sup> from Sable Island

all the way to Boston, Massachusetts – a total distance of 1,051 km.

Marine Pipeline Inc. in New Brunswick and BFC Marine Inc. in Nova Scotia were



*For the trench dewatering, the contractors used Flygt's BIBO pumps in sizes ranging from 2" to 8".*

contracted to lay 568 km of 30 in. pipe for the Canadian portion of the pipeline. This type

of construction means digging a very long trench – which often fills with water because of high water tables and storms. As with most construction projects, time is of the essence, and the quicker these deep trenches can be dewatered, the better.

With an immediate need for a large quantity of submersible dewatering pumps, but no need for them after the project, the pipeline contractors decided to rent the pumps and associated equipment including generators and hoses. According to Jean Legault, Manager for Rental, Resale and Distributors for ITT Flygt Canada, "When the pipeline companies needed to rent pumps and generators,

they both turned to ITT Flygt." Continuing, he noted that, "They wanted a supplier with

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a long track record of reliability, quality and experience and ITT Flygt became the natural choice."

Michael Kerman, Branch Manager for ITT Flygt in New Brunswick, recalled that many of the purchasing people and site supervisors had dealt with Flygt in other locations. "They know that Flygt has the pumps, generators, and hose needed for the job and that we provide 24-hr support and service. But even so, we had a lot of work ahead of us to secure this major rental order. Though the customer knew Flygt, there were other competitors looking for the same business", said Kerman.

With a very large and time sensitive construction project underway, a major team effort began in ITT Flygt Canada. Legault remembers that, "Our suppliers were made aware of the large amount of parts and accessories that we would need. Almost every Canadian Flygt branch was involved in locating pumps, generators and hoses. There was a tremendous effort by a number of people who worked extra hours and took time from their normal duties to work on getting this rental."

When Flygt showed the pipeline contrac-

tors that they could deliver over 40 pumps, 40 generators and discharge hose within 3 days to their construction yards, Flygt was awarded the contract. According to Kerman, "No other supplier was able to get that much equipment on site and on time." The first order was followed by a second order for 30 more pumps and generator sets. During the pipeline's construction, even more pumps and generators than were originally rented, were ordered and had to be delivered quickly to locations in New Brunswick and Nova Scotia.

ITT Flygt and Marine Pipelines used a unique tracking system that the customer had developed. Each pump, generator and hose set had to have a special ID number attached. This allowed accurate tracking while the equipment was being used. The pump or generator could be anywhere within a 500 km radius and the customer had to know its location. Kerman noted that, "This master system also made it easier to return or exchange equip-

ment – an example of the true partnership that we had with our customer."

For the trench dewatering, the contractors used Flygt's BIBO pumps in sizes ranging from 2 to 8 in. Legault notes that the contractor also employed some BIBO "trash pumps",



A rented submersible Flygt Bibo pump is seen here dewatering the pipeline trench.

which could handle dewatering in situations where there was a lot of solids and mud.

Flygt's BIBO pumps gives customers seeking a submersible dewatering pump a wide selection of submersible pumps that

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are robust, mobile and truly versatile. BIBO pumps offer reliable solutions to tough pumping challenges within a wide variety of applications such as large infrastructure and mining projects, large and small tunneling projects, as well as medium and small construction projects such as local utility and telecom construction site projects.

Flygt's BIBO pumps are designed to meet needs for high capacities, pumping from confined spaces, high heads or explosive environments. The pumps feature a multi-vaned open-channel or semi-open-channel impeller available in a variety of materials. The motor is designed to deliver full capacity whether operated dry, fully submerged or partially submerged. These pumps are specifically designed to handle water and other liquids polluted with high concentrations of clay, stone chips, drilling fines, etc.

The pumps and generators were very critical to the success of the project. Dewatering and control of water had to be done where and when it was needed. When the route of a pipeline is set – a very politically and environmentally sensitive process – the contractors encounter many different geological condi-

tions. Legault recalls that, "They went through everything in laying this pipe. It was a mixture of high water and low water table, rock, sand and every type of condition. The equipment had to be reliable and had to work the first time. The project was monitored very closely since no damage to the environment could be tolerated. The water had to be controlled at all times."

In New Brunswick there were a total of 108 pumps, 60 diesel generators and over 2.8 kilometers of hose on rent at the peak of construction. In Nova Scotia there were 55 pumps and 40 generators and 1.4 km of discharge hose. Most of the equipment was on site for 5 months. This single rental represents one of the largest in the history of Flygt Canada. "During the rental our service shop was kept busy with repairs and replacements", recalls Kerman. "We made sure we always had backups on hand and kept in close contact with head office and other branches if more equipment was needed. There was a number of after-hours calls and on each occasion we responded immediately. Someone from our branch could always be contacted 24 hours per day."

Legault notes that, "Flygt Canada has been in the rental business for over 40 years. After rental, the pumps are checked, service, resealed and go back out again for rental." Legault also said that Flygt in addition to four decades of experience, Flygt can turn around with a large inventory, a well-trained staff and great service.

#### PROVIDING A NEW SOURCE OF CLEAN ENERGY

The pipeline brings natural gas from Sable Island and onto the North American continent for the first time where the demand for the environmentally friendly fuel is increasing. In particular, the pipelines will provide high-pressure natural gas deliveries for new electric generating facilities and other customers in eastern Massachusetts. The pipeline also provides east Canada with an open access gas transportation service for the first time. Many Canadian homes were not equipped for natural gas, and residents welcomed the cheaper, cleaner fuel option.

For More Information: [www.flygt.com](http://www.flygt.com)



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## “Cold-Mix Porous Asphalt Surfacing”



*Fact Sheet NI-03  
Trenchless Techniques  
New Installations  
Microtunnel Boring Machine (MTBM)*

### DESCRIPTION OF THE TECHNOLOGY

#### Purpose and Use

The microtunnel boring machine (MTBM) is used to install a pipe by excavating into the ground according to strict line and grade tolerances. Based on the mode of operation, the microtunneling method can be subdivided into the follow two major groups:

- 1) Slurry System, and
- 2) Auger System.

#### Procedure

At an access pit, static pressure is applied on the MTBM using a hydraulic jack. The resulting thrust, coupled with the rotation of the cutting nozzle, makes it possible to excavate the tunnel.

When the MTBM has dug deep enough into the soil, the jack is withdrawn and the pipe is inserted into the rear of the MTBM. The jack applies another thrust, this time on the pipe, which edges forward along with the MTBM. This process is repeated until the MTBM arrives at the exit pit.

The MTBM is guided by laser. The laser is placed in the launch pit, so that the beam hits a target installed in the MTBM. A video camera transmits the image of the target to a screen in an operating cabin on the surface, allowing the operator to control its trajectory. A degree of precision of typically plus or minus 25 mm to 50 mm from a specified line and grade can be achieved using this approach.

Debris is evacuated through a mechanical system (auger) or pumped to the surface in the form of a slurry. The design of the cutting head depends on the soil type.

Bentonite mud is generally used as a lubricant in order to compensate for the friction stresses caused by the pipe installation.

### APPLICATION

#### Types of Pipes and Structures

This technique is used to install specially designed pipes that have a diameter of over 200 mm and that are made of steel, reinforced concrete, fiberglass, clay or polymer concrete.

The MTBM is often used in crowded urban settings, in environmentally sensitive areas and at depths of over 5 m.

#### Preliminary and Complementary Work

To ensure that the work is done properly, it is absolutely crucial to conduct an in-depth

analysis of the surrounding area. Detailed geotechnical and geological studies must



therefore be carried out on the work site.

Provisions must, also, be made for the excavation of two access pits. Launch and exit pits at either end, in a straight line, must be excavated to allow for the insertion and removal of the MTBM. Curved alignments are also possible but should be carefully considered.

### Conditions and Limitations

When determining the pipe size, it must be ensured that the walls of the selected pipe are able to endure the compressive axial thrusts associated with this technique.

Particular attention is required when work is performed in cold weather.

### Deadlines and Timeframes

A certain amount of lead time is required for the delivery of pipes and the preparation of the work site, i.e. the excavation of the access pits.



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The speed at which the work progresses varies according to the inherent conditions of the work site, although it generally falls between 30 m/day and 50 m/day. On average, the MTBM technique can cover a distance up to 400 m a day.

#### TESTING AND MONITORING

All routine tests applicable to the type of pipe being installed must be carried out.

#### STATUS OF THE TECHNOLOGY

The origins of the MTBM have their root in early 20th century pipe-jacking applications. This technology developed swiftly, particularly in terms of applications in sandy sites.

The MTBM was first built by the Japanese in the 70s. It was not until 1972, however, that the first Japanese Komatsu MTBM was developed. The first formal use of microtunneling technology occurred several years later, in 1977. In the 80s, the Germans followed the Japanese and also developed this technology. In the end of the 90s, the first installations were made in Quebec.

This technique is constantly evolving in terms of the diameter and length of the pipe

installed as well as in its applications. The power of the MTBM has greatly increased over the years, and can be expected to evolve in the future.

Other technological advancements are being accomplished in the electronic department such as the improvement of the MTBM guiding system.

*CERIU assumes no responsibility whatsoever concerning the application of the techniques and procedures described in the present fact sheet.*

*To obtain the complete collection «CERIU Fact Sheets» you are invited to contact Mrs. Céline Forest by phone at (514) 848-9885 poste 272 at the Centre d'expertise et de recherche en infrastructures urbaines (CERIU).  
www.ceriu.qc.ca*



## First Shipment of Diesel Fuel From DOE Catoosa GTL Plant

On March 12, Syntroleum Corporation and Marathon Oil Company announced the first shipment of diesel fuel from the newly constructed gas-to-liquids (GTL) demonstration plant at the Port of Catoosa, near Tulsa, Oklahoma. Once peak capacity is reached, the Catoosa GTL Demonstration Facility is expected to produce approximately 70 barrels per day of ultra-clean transportation fuels. The U.S. Department of Energy (DOE), Marathon and Syntroleum funded the design, construction and operation of the project, which cost approximately \$60 million. It contains all of the components required for a commercial scale plant.

Source: Syntroleum Corporation  
Marathon Oil Company

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# Leica Geosystems Introduces New TPS110C and TPS410C Builder Total Stations

Leica Geosystems recently announced the introduction of the TPS110C and TPS410C series, two ranges of Total Stations especially suited for customers working on building and construction sites. The 'C' series instruments feature the new 'Construction' onboard software that allows beginners as well as professionals to do the job quickly and efficiently.

Both ranges feature 10 in. (3mgon) angular accuracy and a 5mm electronic distancer (EDM). All models are available with an infrared EDM, measuring to prisms. Additionally, reflectorless measurement up to 80m with a visible red laser is possible with the TCR110C and TCR410C models. While the TPS110C is unique because of its keypad that allows all operations with only six function keys, the TPS410C features a high resolution LCD with graphical user guidance and onboard memory that makes the use of additional data loggers obsolete.

These 'Builder Total Station' are used for layout of structures, checking as-built, missing line measurements and alignments. "The handling as well as the operation of the units is incomparable in the industry," said the Product Director of Total Stations at Leica Geosystems. "The field proven hardware is now operated through an



*The TPS110C and TPS410C total stations are designed for the construction site. They increase efficiency and productivity on every construction site. Robust, reliable, easy to use and with onboard software that meets the needs of the construction users.*

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innovative 'Construction' software that combines the most important tasks into one program. It perfectly reflects the workflow of construction jobs or building site measurements."

New is also the concept of open performance specification. "If a customer likes the TCR410C because of its ease-of-use but requires higher accuracy, he can easily switch to a higher level model, providing 7, 5 or even 3 in. accuracy and a 2mm accurate EDM, still keeping the operation philosophy of the 'C' model," stated the Product Director.

The Leica Total Stations offer several advantages, such as the use of standard camcorder batteries for full day operation, endless drives and laser plummet. The beam of the EDM is narrow and thus allows very precise pointing to the target. The serial interface on TCR110C and TPS410C opens up the units also for virtually all applications that run off-board, such as PC-software or commercial PDA's.

Leica Total Stations and other surveying products are sold in Quebec by Montreal based Gradtek Électronique inc.

Source: Leica Geosystems AG

[www.leica-geosystems.com](http://www.leica-geosystems.com)

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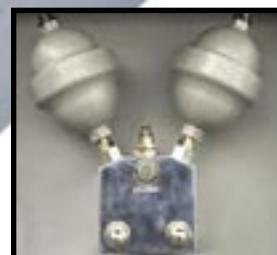
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This super-smooth system - called Soft-Plow - has been designed to absorb the shocks which occur during moving maneuvers with the snow blade in its upright position.

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*(This device is patent pending)*



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