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

On the front cover: a Wirtgen scarifying machine at work on Marie-Anne street in Montreal’s Plateau Mont-Royal district.
KAHILI GAS FIELD PRODUCTION COM- MENCES

Austral Pacific Energy Ltd. reports that production commenced on August 21 from the Company’s Kahili-1A well in onshore Taranaki, New Zealand. NGC, the owner and operator of the Kahili Separation Plant (KSP) and purchaser of the gas, is presently commissioning the facility; and consequently choke sizes are restricted at present, and a stable production regime has yet to be established. On August 24, the first day of extended production, an average production rate on a 12/64” choke was 2.2 million cubic feet per day of raw gas, with a condensate (light oil) to gas ratio in excess of 60 barrels per million cubic feet, and a surface flowing pressure in excess of 2,300 psi.

Gas is now flowing from KSP along the 8 km (5 mile) pipeline linking it to NGC’s regional LTS pipeline, hence to their Kapuni Treatment Station, where propane and butane will be recovered from the stream, and sales gas injected into the national gas grid. The first truckload of oil left KSP on August 24 for the Omata oil tank farm, where it is sold to Shell Oil.

Austral Pacific is the permit operator and has a 45% equity in the Kahili Field, the other participants being Tap Oil (30%) and Claire Energy (25%). CEO Dave Bennett said “We are very encouraged by the early performance of the field, and congratulate NGC on successfully bringing the Kahili production facility into operation. We look forward to the establishment of full, long term production, which will provide the basis for further drilling in the field.”

Source: Austral Pacific Energy Ltd.

$13.5 MILLION TO RE-BUILD MYRA CANYON TRESTLES

Reconstruction of the historic Myra Canyon trestles destroyed by wildfire will begin this fall thanks to a $13.5-million partnership between the provincial and federal governments, Premier Gordon Campbell and Senator Ross Fitzpatrick announced recently.

“The Myra Canyon trestles are a national treasure, a major tourism asset for the Okanagan economy and an invaluable part of our provincial heritage,” Campbell said. “The loss of the trestles was a devastating blow, and their reconstruction is a priority for us all. The same spirit of co-operation that helped us face the fires last summer has allowed governments, the community and local residents to work together to rebuild these vital pieces of B.C.’s history.”

Twelve of the 16 wooden trestles were destroyed and two steel trestles damaged last summer when the wildfire swept through Myra-Bellevue Protected Area. In October, Premier Campbell appointed a task force to develop a recovery and restoration plan. The task force included representatives from the federal, provincial and local governments and the Myra Canyon Trestle Restoration Society. Working from recommendations of a steering committee, the task force selected a plan that includes a combination of scaled-down and historic look-alike rebuilds.

The Myra Canyon Trestle Restoration Society, which has already raised more than $400,000 in additional funds for enhancements such as interpretive displays and programs that will be included in the restora-
Volvo Trucks North America assembles its Volvo VN and VHD trucks in the United States, at the ISO14001 and ISO9001 certified New River Valley Plant in Dublin, Virginia. Volvo sponsors the America’s Road Team. Each truck in the program is certified as a Premium Used Truck only after it passes an in-depth inspection. Dealers who participate in the program must meet specific requirements for trained and dedicated used truck sales personnel.

VOLVO BRINGS PREMIUM PROGRAM TO USED TRUCKS

The new Premium Used Trucks program from Volvo Trucks North America, Inc. provides customers with high-quality pre-owned Volvo trucks through authorized dealers who have committed to exceptional standards for used truck operations.

“Part of what makes Volvo a premium truck brand is ensuring that our trucks retain that premium value and image as they move to their second owner,” said Mike McColgan, truck remarketing development manager for Volvo Trucks. “This means both our pre-owned trucks and our dealers have to meet high standards, so that our used truck customers get the premium level of quality and support they expect.

“There is tremendous demand for pre-owned Volvo trucks and Volvos are recognized as having excellent resale value,” said McColgan. “As an example, a recent industry report said the Volvo VN770’s value is considered to be on par with the top traditionally-styled tractors.”

The new Premium Used Trucks program assists dealers in getting the high-quality stock they need to take advantage of this high demand. Trade-ins are the primary source of the vehicles available through the program. Approximately 90 days before trade-ins are returned, descriptions and pricing are posted on a web site. Eligible dealers can then review this information and make purchases electronically.

Built between 1912 and 1914 by Canadian Pacific Railway, the trestles were part of the Kettle Valley Railway that linked the centre and southeast regions of the province with the main railway at Hope. Decommissioned in 1973, the rail line was purchased in 1990 by the Province and transformed into one of British Columbia’s most popular hiking and cycling trails. In January 2003, just seven months before the wildfire, the Myra Canyon section of the Kettle Valley Railway, now part of the Trans Canada Trail, was named a National Historic Site.

In May 2004, the province converted the majority of Myra-Bellevue from a Protected Area to a Class A Provincial Park.

Each year, 50,000 people visit Myra Canyon and its trestles, generating $5 million in economic benefits.

Source: Public Safety and Emergency Preparedness Canada

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national highway safety outreach program.

Volvo Trucks North America, Inc., is part of the Volvo Group of companies, a publicly held company headquartered in Gothenburg, Sweden. With 2003 sales of approximately $22 billion, Volvo’s business areas include heavy trucks, buses, construction equipment, marine and industrial drive systems, aerospace, and financial services.

Volvo Trucks North America, Inc.

BRIGGS EQUIPMENT, INC. OUTFITS HEAVY EQUIPMENT RENTAL FLEET WITH GLOBALTRACS

Qualcomm Incorporated announced that Briggs Equipment, Inc., the United States’ 14th largest equipment rental company and the foremost Case construction equipment distributor in North America, will outfit its entire heavy equipment rental fleet with Qualcomm’s GlobalTRACS® equipment management solution. The GlobalTRACS solution collects, manages and transmits equipment operating status and location data, all easily accessible through a Web-based application or integrated into existing back-end business software systems.

“In the equipment rental industry, being able to track utilization hours is absolutely crucial to running a successful business,” said Homer Denning, president of Briggs Equipment. “By deploying the GlobalTRACS solution to our entire fleet, we will be able to maintain our equipment at regular intervals to prevent unnecessary downtime and manage our service contracts more efficiently, which directly translates into cost reduction and better service for our customers.”

“Qualcomm is pleased to be working with Briggs, one of the nation’s largest equipment rental fleets, to help them provide even more efficient and effective services to their customers,” said Tim Lewis, senior director of construction equipment operations for Qualcomm Wireless Business Solutions.

“Now, with the help of the GlobalTRACS solution, not only will Briggs significantly reduce their operating costs but they will be able to service their customers better; providing the parts, services and equipment when they need it. That translates into increased productivity for them and their customers.”

Qualcomm is the industry’s global leader in providing high-value wireless data solutions with Network Operations Centers that process more than nine million transactions each day. Qualcomm has shipped more than 523,000 Qualcomm mobile systems to businesses in more than 39 countries on four continents.

Qualcomm Incorporated, headquartered in San Diego, California, is a leader in developing and delivering innovative digital wireless communications products and services based on the Company’s CDMA digital technology.

Source: Qualcomm Wireless Business Solutions

VOLVO CE RENTS SIGNS CONTRACTS FOR RENTAL FRANCHISES IN CANADA

Volvo Construction Equipment Rents, Inc. (Volvo CE Rents), has announced the signing of two franchise agreement for new Volvo equipment rental centers in Alberta and one in Ontario.

Extreme Rentals, Inc. has entered into a Volvo CE Rents franchise agreement to own and operate independent Volvo CE Rents centers in Grande Prairie, Alberta.

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STANTEC TO ACQUIRE ONE OF TORONTO’S PREMIER ARCHITECTURE FIRMS

Stantec announced it has reached an agreement in principle to acquire one of Toronto’s top architecture firms, Dunlop Architects, which also has an office in Hamilton. The addition of Dunlop’s approximately 100 employees will add to Stantec’s architectural and interior design group – already one of the largest in the country – and enhance the Company’s presence in the Greater Toronto Area (GTA).

“We have built a very successful and respected architectural practice in western Canada,” says Tony Franceschini, Stantec President & CEO. “The addition of Dunlop moves us to one of the top architectural firms in the country and increases Stantec’s presence in the GTA.”

Dunlop Architects, a full service architecture firm established in 1953, is recognized as a leader in the design of facilities in the acute and long-term health care, laboratory, justice, civic and institutional, post-secondary educational, entertainment, and high-tech communication markets. The firm provides a wide spectrum of architectural consulting services including architectural design, project management, specifications, contract administration, site review, and facilities programming.

“We’re looking forward to joining with Stantec because of the opportunities it will create for our employees and clients,” says Chris Fillingham, Dunlop Managing Principal. “Our staff will be gaining access to greater technological and financial resources and get the opportunity to work on projects throughout North America while also being able to offer a wider range of services to our clients.”

The transaction is expected to be complete by mid-October.
Source: Stantec

NEW ALUMINIUM TRAILERS AT DELOupe

Deloupe Inc., a semi-trailer manufacturer based in La Guadeloupe, Quebec, has an-
nounced a new business partnership with East Manufacturing of Ohio that will allow Deloupe Inc. to diversify its product line.

East Manufacturing is a North American leader in the aluminium semi-trailer industry. This will enable Deloupe to offer a high-quality product to its clientele in the province of Quebec and Maritimes.

Sales director Pierre Liasse Deloupe says that through this agreement, the company will be able to offer a full aluminium semi-trailer under the name of Ultramax. It will be available in two versions: ‘Ultramax’, with a load capacity of 50,000 lbs., and ‘Ultramax HD’, with a load capacity of 72,000 lbs on 4 feet spread in 2-3-4 axles.

Source: Deloupe Inc.

MEC TO LAUNCH PHOENIX SCISSOR LIFT

MEC Aerial Work Platforms, Fresno, Calif., expects to begin production in the first quarter of 2005 on a new scissor lift line featuring an omni-directional drive system (ODS). The Phoenix scissor lift line is based on proven MEC scissor lift design, with familiar features such as the Powerlift 2 single beam lifting mechanism. The first Phoenix models to be available will be the 1932 ODS and 3068 ODS featuring 19- and 30-foot platform heights, respectively, with other models to follow during 2005. The Phoenix line will be available through MEC dealers along with MEC’s traditional scissor lift line.

Because the Phoenix scissor lift with ODS can rotate in its own footprint, make 90° or 45° turns, or go sideways without turning at all, it is ideal for confined space applications. But, extreme maneuverability is also of interest to everyone, no matter the application.

Working in conjunction with Airtrax Inc., Hammonton, N.J., the developer of ODS, MEC is now in the process of field testing prototype units. A concept vehicle was displayed at ARA’s 2004 Rental Show and a production unit should be available in time for next year’s show.

The Airtrax ODS has no pivot steering wheels. Even vehicles with power steering must pivot their wheel and be moving either forward or reverse in order to allow for proper steering. This method causes friction between the steering wheel and the surface area, which could cause distortion to delicate floor surfaces. By independently controlling the rotation of each wheel, the scissor lift has the ability to travel in any direction, with very low friction to the surface areas.

The Phoenix scissor lifts feature four-wheel drive. The drive module for each Omni-Directional wheel consists of its own independent electric motor, transmission, brake, and controller. The motor turns the wheel hub, which is enencircled with multiple rollers that are angled from the wheel axis. The operator controls the directional movement of the scissor lift with a joystick. Operating on a three-axis system, the joystick delivers 360° control.

The system is low maintenance because the motors do not have brushes or commutators to wear out and they have no grease fittings. They’re lubricated for life. Likewise, the wheel rollers are fabricated from durable urethane and other materials. If individual rollers must be replaced, each one is secured with a single nut, making replacement easy.

Airtrax also offers an electric lift truck featuring ODS. It is called The Sidewinder with 3,000 lbs capacity.

Source: MEC Aerial Work Platforms

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ATLAS COPCO INAUGURATES ROCK REINFORCEMENT COMPETENCE CENTER

Atlas Copco has inaugurated its first dedicated development center for rock reinforcement technology, with the aim to make rock excavation and underground operations safer and more productive.

The center, based in Feistritz/Drau, Austria, is the former headquarters of MAI Ankertechnik, which Atlas Copco acquired in 2002. Atlas Copco has invested 2.3 million Euros in new production machines and to extend and modernize the production facilities, in order to increase productivity and lower costs.

“This dedicated competence center for the development of superior rock reinforcement products has been created to serve the worldwide tunneling, mining and construction industries,” says Björn Rosengren, Business Area Executive, Construction and Mining Technique. “Customers can expect to see many additional, interesting products from Atlas Copco in the years ahead.”

Atlas Copco’s rock reinforcement product line has been relocated from Sweden to Austria to join Atlas Copco MAI’s self-drilling anchors product line, enabling the company to utilize common resources and facilities in a more efficient, productive way. In line with the Group’s strategy of continuous innovation, the center aims to offer innovative, value-added products for demanding rock reinforcement and ground engineering applications.

The competence center is part of Atlas Copco Underground Rock Excavation division, within Construction and Mining Technique. The creation of dedicated competence centers is of crucial importance to this business area.

Source: Atlas Copco, Construction and Mining Technique

ROADTEC SELECTS BLS POLY BOLT-ON TRACK PADS FOR ITS RX-500 MILLING MACHINE

Roadtec, Inc., manufacturer of world-class equipment for the road building industry, has announced that it will offer, as an option, the new BLS Poly Bolt-On™ track pads on its RX-500 milling machine. The RX-500 is a 500 HP machine available with three or four track assemblies. This lighter weight versatile machine allows contractors to cut up to thirteen inches deep with widths of 6’3”, 6’7”, or 7’2”, and is highly maneuverable for urban situations.

BLS Enterprises, Inc., of Itasca, Illinois, U.S.A., has supplied Roadtec with TUPPADS® bonded-to-triple grouser track pads for many years. The newly introduced BLS Poly Bolt-On™ version, which bolts to the steel triple grouser, drew the attention of Roadtec engineers when they talked to BLS President, Barry Stoughton, at a recent trade show, and he demonstrated for them the benefits of utilizing the new type track pad.

Earlier in 2004, Roadtec announced that it will offer, as optional equipment, the new BLS Poly Bolt-On™ track pads on its new RX-900 milling machine. This new highway-class, full lane/half lane milling machine was introduced at the World of Asphalt, held in Nashville, Tennessee, U.S.A, March 16-18, 2004.

The BLS Poly Bolt-On™ track pad is the first of its kind to be manufactured for track vehicles and is seen to be especially useful on milling machines. Owners of milling machines can now have the labor savings of easy installation and dismantling of a bolt-on pad and the cost savings that can be realized by reusing the steel grouser, combined with the durability and long life of a polyurethane track pad. BLS Enterprises Inc. has received much positive feedback from customers who have been using the Poly Bolt-On™ track pads. Customers also save money by replacing only the Poly Bolt-On™ track pads and reusing their steel grousers after the first purchase. Savings also result from lower shipping costs, because much of the weight is in the steel grouser. Costs to assemble old cores for shipping become a thing of the past. Because of simplified installation and removal, companies can now replace track pads in the field with a just small crew and avoid having to transport the machine back to the company’s garage.

BLS Enterprises, Inc. is the first company to sell bonded track pads made from polyurethane and has done so for eighteen years. Now BLS is the first company to manufacture bolt-on to triple grouser track pads made from polyurethane. In fact, the new BLS Poly Bolt-On™ track pads, like the bonded pads, are made from a special improved polyurethane compound known as Poly II, for up to 24% longer wear.

Roadtec, a legendary manufacturer in the road building industry, is the first machine maker to realize the benefits of using BLS Poly Bolt-On™ TM track pads, but it will certainly not be the last.

Source: BLS Enterprises, Inc.
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For more information, stop by your Cat Dealer today. While you're there, ask about the Cat Work Tool opportunity, quality products that will make the Cat difference.
ArvinMeritor and Raydan Manufacturing Enter into Licensing Agreement for Vocational Suspensions

ArvinMeritor, Inc. Commercial Vehicle Systems (CVS) business group announces the signing of a licensing agreement with Raydan Manufacturing Inc., Alberta, Canada, for the patented Air Link™ rear tandem suspension product line. This exclusive agreement begins a long-term global collaboration between the two companies authorizing ArvinMeritor to market, engineer and manufacture the Air Link rear suspension product line, up to and including 52,000 lb. gross tandem weights for commercial truck, trailer, specialty and military OEMs. Raydan will continue to manufacture the suspension for crane chassis, custom retrofit, and all applications above 52,000 lb. gross tandem weight.

“This is a significant agreement for ArvinMeritor as we continue to expand our suspension module product line and meet our customers’ expectations as a full systems supplier. We are proud that Raydan has the confidence in our engineering, manufacturing, sales and service capabilities to enter into this licensing agreement,” said Sergio Carvalho, vice president and general manager, Brakes, Suspension Systems, Trailer Products and Ride Control.

Effective immediately, all engineering, marketing, product planning and sales activities for Air Link applications specified within the agreement will be managed from ArvinMeritor’s headquarters in Troy, Michigan. This suspension is the industry’s only walking beam air suspension and has been tested successfully by Canada’s National Research Council, the U.S. and Canadian militaries, as well as private corporations. It is standard original equipment on many road crane and fire apparatus vehicles.

“We are very pleased to be working with ArvinMeritor,” said Ray English, president and CEO of Raydan Manufacturing Inc. “Their global presence makes the Air Link available worldwide, and as the largest axle manufacturer in North America, the Air Link is a natural fit.”

Established in 1992, Raydan Manufacturing Inc. is an Edmonton, Alberta-based producer of specialized suspension and coupling systems for trucks and heavy equipment.

Source: ArvinMeritor
Air-Weigh® On-Board Truck Scales Now Available as Factory Option For Freightliner Trucks

Freightliner Trucks announced today the availability of the Air-Weigh® in-dash on-board truck and trailer scale system as a factory option for all truck models with air suspensions. The Air-Weigh Self-Weighing Truck Scale™ can improve productivity and reduce operating costs and delays caused by check-weighing at truck stop scales.

Freightliner Trucks is the first OEM to offer Air-Weigh on-board scales as a factory option for its product line. The scales can help decrease operating costs by eliminating overweight fines and scale fees associated with overweight loads.

“The Air-Weigh scale system takes the guesswork out of loading, which helps our customers maximize their time on the road while minimizing fines and fees”, said Mark Lampert, Senior Vice President, Sales and Marketing, Freightliner Trucks. “Freightliner Trucks is pleased to be the first to make self-weighing trucks available to its customers.”

The Air-Weigh system consists of an in-cab truck scale and a remote trailer scale. The in-cab unit acts as the system master controller. It displays steer, drive and lift axle weights, up to seven trailer suspension weights if equipped, GVW and net payload weight.

The Air-Weigh on-board scale is a true scale system that is calibrated to each vehicle’s suspension and weight, which is measured by an installed air pressure sensor in the suspension air line. Once the system is calibrated, the Air-Weigh scale displays the weight of the axle group to within 300 lbs. of a DOT certified scale.

When a self-weighing tractor picks up a trailer that is equipped with the Air-Weigh trailer scale, the trailer weight data is automatically transmitted to the truck scale in-cab display gauge and is included in the GVW and net payload weights.

The Air-Weigh AW5800 series scale system is available on any Freightliner Trucks medium or heavy-duty truck models with rear or combination front and rear air suspensions.

Direct sensing of the front axle is also available on vehicles with the Freightliner AirLiner® front suspension. On those tractors without front air suspension, the Air-Weigh truck scale automatically calculates the transfer of weight on and off the steer axle.

“Freightliner is committed to offering options and features that contribute to efficient and productive operations,” said Lampert.

“By offering customers the option to spec the Air-Weigh scale system in our vehicles, we are helping them achieve a more successful business operation.”

Source: Freightliner Trucks
From innovation to standard feature
50 Years With Volvo's Turbocharged Engines

For 50 years, since June 5, 1954, Volvo has continuously marketed trucks with turbocharged engines; initially as an option for customers wanting maximum horsepower, but since 1980 as standard on all Volvo trucks in all weight classes.

Volvo has never been famous for its adventurous spirit but rather for its steady, cautious approach to technical innovation. Volvo’s technical founding-father, Gustaf Larson, wrote in a renowned sales manual back in 1936 that Volvo had never introduced new-fangled ideas that had not been tried and tested for at least a couple of years!

Turbocharging, however, was no ‘new-fangled’ idea. A method was patented back in the early 1900s whereby a turbocharger pressed more air into the engine’s cylinders, thus increasing power output and operating efficiency. During the half-century or so before Volvo started its continuous series production of turbocharged engines for trucks, this technology was utilised in applications such as large ship engines, railcar engines and even the odd experimental truck.

LEGENDARY ENGINE DESIGNERS

In the early 1950s, there was considerable enthusiasm at Volvo’s diesel engine design department. When the turbo experiment got under way in 1951, it was only five years since the company had starting making pre-chamber diesel engines. The first direct-injection Volvo diesel engine had been built just one year previously, in 1950.

At this time, Volvo was a small truck factory selling its products mainly in Scandinavia. Production focused on medium-sized trucks. There were no resources for the development and manufacture of bigger diesel engines than the largest then available, which had a displacement of 9.6 litres. The company’s engineers agreed that an even bigger engine would add unnecessary extra weight and excessive size and lead to high fuel consumption.

At this time, Volvo’s engine design department was headed by the legendary John Stålblad. His team included Bertil Häggh, later the head of Volvo Trucks’ department of Engine Design and known throughout the truck industry as ‘Mr Turbo’.

John Stålblad and Bertil Häggh discovered that turbo manufacturer Eberspächer was in the process of developing a smaller turbocharger that might be suitable for applications such as truck and bus engines. The two engineers realised that turbocharging might be the answer to their quest for higher engine power outputs.

PRACTICAL TESTING

The Stålblad-Häggh team realised that turbocharging required stronger engines than the conventional normally aspirated units currently produced. This realisation fitted in well with the company’s strategic plans: the largest truck engine at the time had been developed for small production volumes using high-tech methods adopted from Volvo’s aircraft production, and would scarcely be suitable for mass-production techniques.

While other manufacturers at this time experimenting with turbocharging chose to add the new technology to already existing engines, Volvo went the other way: the company developed an engine that from the very outset was designed to accommodate turbocharging, but Volvo also offered this same engine without the new feature, for customers who did not have much faith in the new technology or who did not require the added power it offered (or who hesitated over the additional price-tag for the extra horsepower).

In 1951 work started on the new engine that would be designated the TD96AS (turbocharged), D96AS (normally aspirated) and D96AL (in horizontal configuration, for buses). This was paralleled by series production of the VDF engine with the same cylinder dimensions as the forthcoming ‘96-series’ engine. This was admittedly a lightweight and dependable power unit, but it was also expensive to make and did not really have sufficient margins for turbocharging without compromising on reliability and service life.

It was soon established that the new D96 engine (in its basic form) would have the same power output as its predecessor the VDF (150 hp). However, most of the design work was aimed at creating generous safety margins so that the TD96 (the turbo version) would be able to produce far higher outputs in the future.

Although this was an entirely new engine and although there were no computer-aided design programs at this time, the design process was completed in a very short period of time. This was because the engineers were able to draw on their experiences from the VDF engine, which had the same shape of combustion chamber as the new 96-series engine.

To test whether the turbo variant was as reliable and durable as the previous engines and the non-turbo version, the new engine was secretly fitted to a number of L395 Titan trucks used for daily haulage duties.

Experiences from these practical tests were very positive. Although there was potential for extracting immensely high power outputs, Volvo decided to limit power output to 185 hp (35 more than the non-turbo version).

Initial plans called for just 200 trucks to be powered by the turbocharged engine, followed by a thorough evaluation of the
experience gained and a decision on whether to continue producing turbocharged trucks. Owing to the excellent feedback, however, production continued without a break after delivery of the first 200 turbo trucks.

**JUNE 5, 1954**

From June 5, 1954, customers could specify the new L395 Titan Turbo. This more powerful truck was far more expensive than the ‘normal’ Titan (which was still one of the most powerful trucks on the market at this time). While the base version of the L395 Titan cost 32,300 kronor, a Titan Turbo cost at least 42,500 kronor (the turbo engine cost an additional 5,500 kronor but it also required a stronger rear axle with the renowned ‘Norrländ’ final drive at a price of 3,700 kronor, which was able to handle the higher torque).

It would be a few months before customers could take delivery of the most powerful Volvo model. A nationwide tour took place during the summer, highlighting the introduction of the legendary Volvo ‘Viking’ with its 115 hp engine and where the spectacular P1900 sports car was also unveiled to potential customers. It was not until the end of October 1954 that the first turbo trucks were finally delivered to their eager customers.

**INCREASING POWER OUTPUTS**

Before John Stålblad and his team of engineers authorized these higher power outputs, they wanted to evaluate the experience gained from the many turbocharged trucks from autumn 1954 that had been used in regular haulage operations. It therefore took another five years before they finally gave the go-ahead for the 185 hp that the TD96 engine produced.

It was not primarily the engine’s basic design that limited the potential power output, but rather the poor lubricants available at the time, which were of far inferior quality compared with those in use today.

In 1960, power output increased to 195 hp. At that time, it was clear that it was not the engine that was the critical component, but rather the ‘driveline’ as a whole (that is to say the combination of engine, gearbox and rear axle). It wasn’t until Volvo presented an entirely new rear axle in 1963, with two-stage hub reduction, that power outputs were allowed to make a significant upsurge – to 230 hp.

The TD96C engine’s 230 hp, however, was the upper limit for good reliability and long service life. That is why work on an all-new 9.6-litre engine had already been launched, the ‘100-series’ engine (that, however, is an entirely different story).

**BETTER ENVIRONMENTAL PROPERTIES**

When turbocharging made its appearance on Volvo’s engines, the main aim was increased power output (and increased torque), combined with unimpaired fuel economy. Better environmental properties, quieter operation and cleaner exhaust emissions were simply added benefits that did not come into focus until much later – but they were benefits that would force Volvo’s competitors to adopt turbocharging too – albeit rather unwillingly.

Following the success of the first turbocharged trucks, Volvo introduced turbo engines (initially as options) in small and medium trucks too.

In 1961, both the 6.7-litre engine (in the Volvo Viking Turbo) and the 4.7-litre engine (fitted to the Volvo Raske Turbo) came with turbo power.

1970 saw the introduction of the F89, the world’s first truck with a turbo engine as standard.

In 1980, Volvo made its last non-turbocharged trucks.

**NO RESTING**

Already back in 1963, practical tests were conducted with an intercooler as a supplement to turbocharging with the aim of improving reliability and extending the service life of the considerably more powerful engines. The technology functioned perfectly, but at the time there was no real need for increased engine power and the transmissions of the day did not have sufficient margins to handle the significantly higher torque produced. 1978 saw the introduction of the F7 Intercooler which, not least thanks to its engine technology, won the ‘Truck of the Year’ award.
In 1987, Volvo was the first European truck manufacturer to present the very first series-produced truck engine available in Europe (the TD122FS) to feature electronic fuel injection, EDC.

In 1987, Volvo began utilizing ‘articulated piston’ technology in its TD102FS engine. Articulated pistons are made in two parts from different materials and can handle higher power outputs without jeopardizing reliability or service life, while contributing to a low noise level and relatively low exhaust emissions.

Back in 1987, Volvo also introduced its first 16-litre engine, the TD162F, with four valves per cylinder.

1993 saw Volvo introduce its most revolutionary engine thus far, the D12A, in its FH12 truck model. This made Volvo the first vehicle manufacturer with an in-house designed engine that featured not just a turbocharger, intercooler and four valves per cylinder, but also an overhead camshaft, fuel supply via electronic unit injectors and a unique, patented engine brake known as VEB (Volvo Engine Brake).

In 1995 Volvo unveiled its vision of tomorrow’s distribution truck in the form of the ECT (Environmental Concept Truck) powered by a gas turbine. It could run on a wide variety of fuels, including renewable fuels that contribute to a cleaner environment. This was paralleled by an experiment with hybrid trucks that combined a traditional diesel engine with electrical power for the lowest possible environmental imprint when operating in built-up areas.

In 1996 Volvo introduced its D6A-250 engine that featured a turbocharger, intercooler and a mechanical compressor or supercharger, in the FL6.

Today Volvo offers a variety of solutions centered on environmentally optimized vehicles for use in vulnerable environments, such as the G6B (a 6-litre engine running on natural gas) and the exhaust filter.

DEVELOPMENT CONTINUES...

For 50 years now, Volvo has been the only manufacturer to continuously produce trucks with turbocharged engines. Development has been progressing steadily all the time. The 1954 Volvo TD96AS produced 185 (gross) horsepower. The 2004 Volvo D16C–610 pumps out 610 (net) horsepower.

In 1954, the Volvo TD96AS offered maximum torque of 73 kilogram-meters (corresponding to about 715 Nm). Torque in the 2004 Volvo D16C–610 peaks at 2,500 Nm.

At comparable power outputs, today’s modern truck engines from Volvo are more fuel-efficient, quieter and produce cleaner exhaust emissions than their 50-year-old ancestors.

And development continues ...

LEADING GLOBAL MANUFACTURER

Volvo is today a leading manufacturer of large truck engines. Volvo's engine factory is today one of the world’s largest production facilities for the manufacture of large diesel engines (over 9 liter displacement). The factory in Skövde produced 87,881 diesel engines in 2003 for installation in commercial vehicles and for marine/industrial applications. Volvo also manufactures diesel engines in Curitiba, Brazil. In addition, preparations are underway in Hagerstown, Md. for production of Volvo engines in North America, in time for the 2007 emissions regulations.
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Canada’s First GM Hybrid-Equipped Buses

General Motors of Canada and New Flyer Industries announced today that BC Transit will be the first transit system in Canada to put GM’s advanced hybrid diesel-electric system in regular service. Buses equipped with GM’s hybrid system improve fuel economy by up to 50 percent and reduce emissions by up to 90 percent when compared to a conventional diesel.

Michael Grimaldi, President of General Motors of Canada, said, “With this agreement, BC Transit will set the standard for fuel efficient, environmentally-friendly bus fleets in Canada. We are in discussions with other transit agencies in Canada and have received genuine interest from authorities in Toronto, Montreal, Vancouver, Edmonton, Hamilton and other jurisdictions.”

John Marinucci, President and CEO of New Flyer said, “We are extremely pleased to announce our first hybrid electric bus sale in Canada after considerable success in the U.S. New Flyer and GM have emerged as the industry leaders in this field. We have a significant portion of our production dedicated to hybrids and we look forward to providing our hybrid buses to other transit systems across Canada.”

BC Transit, the provincial agency responsible for municipal transit systems across the province, has signed a contract to purchase six 40-foot (12m) production hybrid diesel-electric buses, with delivery in the spring of 2005. Three of the buses will go to the Victoria Regional Transit System and three to the Kelowna Regional Transit System. The GM hybrid system uses dual electric motors for regenerative braking that slow the bus down and capture the energy into the advanced battery system. This captured electrical energy is then used to launch the bus from a stop using quiet electric motors instead of the diesel engine.

“BC Transit is committed to identifying and adopting new technologies to enhance environmental quality,” said Greg Solcombe, Chair of BC Transit. “The hybrid electric bus has major advantages in not only environmental quality but in lower operating and life cycle costs as well as fuel costs. We look forward to putting these buses into service.”

Industry Minister David L. Emerson said,
“British Columbia has long been on the cutting edge of environmental technologies and I am pleased to see the adoption of these hybrid buses as a continuation of the region’s leadership in this area.” “These hybrid-buses are an excellent example of putting advanced technologies into action to help Canada address climate change,” said the Honourable R. John Efford, Minister of Natural Resources Canada. Environment Minister Stephane Dion also adds, “It is this kind of collaboration that will allow Canada and Canadian business to become global leaders in innovation and environmental excellence”.

New Flyer is headquartered in Winnipeg with two facilities in the U.S. and is the largest manufacturer of heavy-duty transit buses in North America. New Flyer’s innovative low-floor and articulated buses are operated by public transit authorities in New York, Los Angeles, Vancouver, Seattle and many other major cities in North America. New Flyer is also supplying 235 GM Allison hybrid buses to King County, Washington. By the end of 2004, New Flyer will have 309 hybrid buses in operation with over 1 million service miles.

Source: GM Canada, New Flyer, BC Transit

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**Record Number Of International Exhibit Pavilions at Conexpo-Con/Agg and IFPE**

Conexpo-Con/Agg 2005 and the co-located IFPE 2005 will host a record number of international exhibit pavilions, bringing an added dimension to the shows. The pavilions will provide attendees with access to product innovations and services developed outside the U.S. Attendees will also have the opportunity to develop global business contacts through the industry trade groups organizing the pavilions.

Conexpo-Con/Agg 2005 and IFPE 2005 will be held March 15-19, 2005 at the Las Vegas Convention Center in Las Vegas, Nevada, USA and will be the international gathering place in 2005 for the construction, construction materials and power transmission industries.

Conexpo-Con/Agg 2005 will feature eight international exhibit pavilions with exhibitors from China, Finland, Germany, Italy, Korea, Spain and the U.K. (Two Chinese industry groups are hosting pavilions at the show.)

IFPE 2005 will host two international exhibit pavilions run by Chinese trade organizations as well as an Italian pavilion and a pavilion featuring exhibitors from Taiwan.

The Conexpo-Con/Agg 2005 international exhibit pavilions will be located in the North Hall, Central Hall 1 and Central Hall 5 as well as outdoors in the Gold Lot. In addition, satellite stands associated with the international exhibit pavilions will be located in product concentration areas throughout the show to make it easier for attendees to find the types of products they are interested in. The IFPE 2005 international pavilion participants will display their products and services in South Hall 2, where IFPE is located.

Source: Conexpo-Con/Agg 2005 and IFPE 2005

DEMO International 2004

The Canadian Woodlands Forum DEMO International 2004 show, which was held September 16-18 near Quebec City in Laval University’s research forest, drew thousands of people to see and feel what was new in the forest.

Initiated in the 1960’s by the Sustaining Members Group of the Woodlands Section of the Canadian Pulp and Paper Association (now known as the Canadian Woodlands Forum), the DEMO show has become a world-class event with visitors coming from the US, Chile, Russia, United Kingdom, France, New Zealand, Finland, Austria, Sweden, Brazil and Australia to name a few. The sites were fantastic and many kudos are due to the exhibitors who obviously put a tremendous amount of time and planning into their sites. Visitors were not disappointed as they were able to see the very latest lines of equipment available from the major manufacturers “live and in action”.

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Champion Motor Graders is Back in the News

One door closed and another door opened. That is the day Volvo Compact Motor Graders was acquired by Champion Industries LLC. “We had always hoped that if Champion or Volvo decided to divest itself of this line that they would talk to us first,” said Gary Abernathy, President of the new Champion Motor Grader organization. “We are very excited by this turn of events. To once again be affiliated with the Champion name as it relates to motor graders is something that we feel very strongly about.”

Abernathy’s original compact motor graders business became part of the Champion Motor Graders line in 1993, which was then acquired by Volvo Construction Equipment in 1997. When Volvo recently decided to divest the compact graders, and retain only its full-size graders, Champion Industries was formed to take over the line.

According to Gary Abernathy, the Champion line got its start as a family owned company as did his own organization and he considers it a real privilege to be able to put the Champion name and gear logo on their machines.

“With so much at stake, I am sure that if Volvo did not feel we could properly represent the name and the built-in brand equity, we would not have been given the opportunity.”

PART OF A WORLDWIDE ORGANIZATION

“From a manufacturer’s perspective, it was wonderful to be part of two of the greatest names in the history of the construction equipment industry – Volvo and Champion,” said Bryan Abernathy, Vice President of Marketing & Sales. “Today, the new Champion Motor Graders are better as a result of our association. You don’t spend that long with some of the greatest construction equipment engineers in the industry without learning lots.”

Some of the changes and product improvements that have been incorporated into both the C-60/66 B and the C-80/86 B Motor Graders include a new pedestal, incorporating industry standard controls, and an isolated cab, which dramatically reduced sound levels while improving operator comfort and productivity. Other benefits of being part of the world’s leading manufacturer of construction equipment is that in 2002, the Charlotte operation and home of the Compact Graders received its 9001 ISO Certification and this year received its 9000:2000 Certification.

“Having ISO Certification means that our employees know how to build a compact grader,” said Bryan Abernathy. “This certainly differentiates us from some of the other niche manufacturers who may not always follow a disciplined procedure during the build or engineering portions of the job.”

“The certification process was very gratifying for us,” he continues. “We have always had a strong quality discipline. With help from Volvo, we were able to document our existing procedures and meet the ISO guidelines without needing any real changes to the way we build. We just had to get it written down according to form.”

Bryan feels that ISO certification, along with the fact that Champion makes the only compact graders with EPA Tier 2-compliant turbo engines, differentiates them from the other players who have not achieved this level of excellence. “This should give us a
distinct advantage on governmental bids where meeting EPA standards will soon become part of the bid spec.”

RIGHT MACHINE FOR THE JOB
Gary Abernathy pointed out that other markets where the machine has success include municipalities and State DOTs. In the case of the municipalities, city workers are using it for patchwork on roads or ditching. In the case of the State Department of Transportation, with the price of fuel and labor rising in direct disproportion to budgets available, some of the DOTs are choosing the compact graders for many of the same reasons contractors have been using them for years – easy to get to the job site, more convenient and they do not need a certified grader operator for the machine.

THE GROWTH OF THE COMPACT MARKET
According to industry reports, the compact equipment sector is still growing. Some of this is driven by subdivision projects, where homes that are being built closer together. The end result for grading contractors is the need for maneuverability. “The contractor still has to get onto the site, complete his work and get off the site. This makes the new Champion Motor Grader the right machine for the job.

“Contractors have always liked the machine because they have been able to maneuver it around. As well, they like it because of the versatility it offers and the attachments that are available. For some of them it is almost like a tool carrier,” said Bryan Abernathy.

“As well, there is a significant price differential between the compact grader and a regular-sized grader. If all you need is a 15,000 lbs grader,” continued Gary, “then our C80 B will do the job. Governments and contractors do not want to spend the money to bring a 30,000+lb. machine to the job site when a smaller more efficient one will do.”

Abernathy noted that machine weight can be a critical factor. With the state of today’s bridges in many parts of the world, road profiles can restrict certain large pieces of equipment from the job site. If the load limit on the bridge is 20,000 lbs, then sending a 33,000 lbs machine to do the job is not an option.

NEXT STEPS
Both Gary and Bryan are looking forward to the challenges ahead of them including building a dealer base. However, they know that with the equipment that they are offering, the experience that they both bring to the operation and the team that they have been working with for the last 11 years, the new operation is ready for those challenges. 

“We made a lot of good friends in the Volvo organization and we plan to stay in touch with them.”

Champion Motor Graders, the newest company in the construction equipment industry with a long and successful history, has their head office and manufacturing facility in Charlotte, NC. At this plant, they manufacture motor graders with an operating weight of 12,000 to 15,500 lbs.

Source: Champion Motor Graders

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At the Great American Trucking Show, held last month in Dallas, Texas, Freightliner Trucks unveiled the new Business Class M2 106V vocational truck. It is a highly-versatile vehicle engineered to be agile, efficient and reliable. It also complements the Business Class M2 112V, which was launched in the second quarter of 2004. The M2 106V and 112V are designed for specialized applications which require heavy-duty, front-end stability and power. The M2 V truck models are ideal for snow plow and crane operations, along with construction, agriculture, fire and emergency, refuse, utility and municipal and governmental services.

“As we see Freightliner Trucks’ business increase in local and regional distribution and services applications, we expect the introduction of this vehicle to allow us an even greater penetration of the vocational market,” said Mark Lampert, Senior Vice President, Sales and Marketing, Freightliner Trucks. “We believe the versatility and reliability of the new Business Class M2 106V makes it a compelling value for the market segment.”

The 106V incorporates all of the same key features as the Business Class 112V in a smaller, versatile package. Features include a front engine power take-off (PTO) provision for powering snow plows, refuse packers, cranes and utility equipment. Additionally, front frame extensions provide a solid mounting point for hydraulic pumps, winches, front stabilizers and snowplows. These integral frame extensions are offered in 6-, 12- and 24-inch increments.

Along with the other vehicles in the Business Class M2 product line, the new M2 106V features the Freightliner Trucks Multiplex Wiring System that enables body builders to modify the PTO interlocks with software instead of designing a new harness. Additionally, a clean back-of-cab allows for easy body installation while exhaust stacks can be mounted on the right or left side, vertically or horizontally.

As part of the Business Class M2 product line, the new M2 106V is built for reliability, efficiency and maximum productivity. Its lightweight aluminum cab maximizes payload and resists corrosion. The Business Class M2 106V also features a standard stationary grille...
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and optional hood access hatches for ease of service, which reduces maintenance time and costs.

The new Business Class M2 106V offers features which improve drivability and maneuverability. The M2 106V offers an up-to 55-degree wheel-cut, allowing for maximum agility while the large windshield and low-profile dash provides an expansive view. Fresnel windows are available for a wide-angle passenger-side view.

The Business Class M2 106V comes standard with a 6.4-liter Mercedes-Benz MBE 906 engine which offers up to 260 HP, 520-700 lb ft of torque, excellent fuel economy and the best power-to-weight ratio in the industry. The 7.2-liter MBE 926, with up to 330 HP and 800-1000 lb ft of torque, is available as an option along with the Caterpillar C7 and C9 engines. A full range of transmission options are available including the Eaton Fuller manual, Allison automatic and the Mercedes-Benz Automated Gear Shift.

The new M2 106V is particularly effective for jobs that require increased front-end stability. Available with front suspension ratings up to 20,000 lbs and single or dual steering gears, the M2 106V is able to take on jobs previously unsuited for a truck its size.

A complete front axle selection, rated from 10,000 lbs to 20,000 lbs, is available on the new M2 106V to meet the most demanding applications. Rear axles ranging from 21,000 lbs to 46,000 lbs are offered, rounding out the vehicle’s ability for heavy-duty applications.

Multi-leaf or taper-leaf front suspension is available as well as Freightliner’s proven Air-Liner® or TufTrac® rear suspension systems, with front suspension ratings from 10,000 lbs to 20,000 lbs and rear suspension ratings from 21,000 lbs to 46,000 lbs.

The new Business Class M2 106V also features a standard 1,000 in² radiator. The radiator is raised up so that the PTO shaft coming out of the engine runs under the radiator rather than through it, for enhanced cooling capacity and optimal packaging within the engine compartment.

The new Business Class M2 106V is available in Day Cab, Crew Cab and Extended Cab configurations.

“The release of the new Business Class M2 106V bolsters the already robust Business Class M2 product line,” added Lampert. “This vehicle continues the legacy by offering the latest technology and heavy-duty features which allow operators to get any job done with maximum efficiency and driver comfort.”

Source: Freightliner Trucks
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Urban Infrastructures, Managing the Assets, Mastering the Technology

This tenth edition of Urban Infrastructure Week represents the culmination of a decade of ongoing commitment and decisive action on the part of CERIU and its partners to secure the sustainable and economical development of urban infrastructure. This year’s theme, “Urban Infrastructure: Managing the Assets, Mastering the Technology,” is an invitation to participants to focus on the various steps involved in the sound planning of investments related to urban infrastructure rehabilitation as well as on the avenues available to fund expenditures of this nature.

Essential infrastructure systems, including waterworks, sewer systems, municipal pavements and public utilities, occupy a critical place in the municipal framework, alongside public buildings, libraries, parks and recreational facilities. Keeping them in good working order and preserving their value requires a great deal of imagination and money. Recent innovations in inspection, rehabilitation and management have undoubtedly helped make the absolute most of the available resources — but this is simply not enough.

Recently, the Coalition pour le renouvellement des infrastructures du Québec and the Conference Board of Canada estimated that municipalities would need a little more than $1 billion a year for the next 15 years to make up for the accumulated maintenance deficit. In this context, it is obvious that short-term federal and provincial subsidies are inadequate and that long-term infrastructure funding must be a core priority for municipalities looking to ensure the sustainability of their urban infrastructure systems.

In Quebec and around the world, efficient planning is a must. This requires stakeholders to rigorously analyze their respective situations and actively seek out innovative, cost-effective solutions. What’s more, provincial and federal infrastructure policy is increasingly requiring municipalities to prepare an action plan. In order to establish their priorities in this regard, they must also eventually produce inventories and status reports.

The process is a long and time-consuming one, which requires the involvement of both the government and the public and which promises to dominate the attention of the various urban infrastructure stakeholders in the coming years.

Source: Centre d’expertise et de recherche en infrastructures urbaines
Tel: (514) 848-9885, www.ceriu.qc.ca

Mark Systems Announces Agilis

Mark Systems announces the release of Agilis, the first modern, all-inclusive software suite specifically designed for the construction industry. Agilis utilizes state-of-the-art technology to deliver highly effective equipment asset management and advanced job management, integrated with a fully-featured construction accounting system. “The construction industry deserves a fully-featured, state-of-the-art system that addresses industry-specific needs for asset and job management as well as basic financial management,” stated Robert Comperchio, vice president of field operations for Mark Systems. “Agilis is that system.”

Agilis equipment asset management module reduces costs by optimizing equipment utilization and maintenance as well as its acquisition and disposition. With industry-leading machine-to-machine (M2M) technology providing real-time status of engine use and location, the system’s integrated dispatch allows the company to schedule equipment use efficiently according to job requirements. Significant cost savings can result from avoiding unnecessary equipment rentals. By integrating work orders, parts inventory and maintenance tracking, Agilis optimizes both manpower and material. The system even produces equipment break-even analyses and profit and loss statements for management decision making.

“Asset management is critical to construction company profitability,” said Roy Walker, president of WES Construction. Agilis increases equipment utilization while decreasing direct labor and total direct costs significantly.

Agilis’ job management module allows unprecedented ease and accuracy in managing people, equipment and materials while providing automatic time and materials collection for billing. Single point-of-entry input of daily man-hours, equipment hours, materials orders and the progress of each phase of the job give managers direct, real-time visibility into job progress and instantly flags out-of-budget expenses. Comprehensive vendor analysis and rating enables managers to easily identify the best vendor for a particular material or job. Agilis allows the production time card to be filled on paper, via laptops that get docked, or via wireless devices such as cell, satellite or WiFi.

Job management is the core of the construction industry, key to budget control and accurate billing,” said Peter Griffin, General Manager of WES Construction. “Agilis will allow us to respond immediately to job site situations that can mean the difference between profit and loss.” Key to Agilis’ ability to enhance profitability is its industry-leading single point-of-entry system which captures all essential data at the relevant point of activity, enabling a rich suite of reports and automatic actions. “By using state-of-the-art technologies,” explains Mark Worsnop, Mark Systems’ president, “including Microsoft SQL server, Microsoft .Net developer suite, and Crystal Reports, we were able to build a single point-of-entry system that allows a construction company to enjoy sophisticated results without increasing demands on office or field staff.” Matt Karam, Mark Systems’ senior software engineer, concludes “Nothing for this industry has ever been so complete.”

While Agilis includes comprehensive industry-standard construction accounting, Mark Systems has extended these features to include: insurance claims management and accident tracking; automatic email notification to insurance companies for equipment and personnel changes; and multi-company, multi-profit center accounting.

Source: Mark Systems
www.mark-systems.com
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InfraStructures October 2004 – page 30

Aluma Systems Wins Dubai Shoreline Apartment Project Supplying Alumalite Flying Table

Aluma Systems announced recently that it was awarded the formwork contract for four residential/commercial tower blocks of 11 floors complete with podium levels. The contract is part of the Shoreline Apartments on The Palm Jumeirah. The total concrete area of the project is in excess of 110,000 m² and is expected to be completed by April 2006.

The scope of the Aluma Systems’ contract is to provide one and two thirds of a floor of Alumalite Tables on each block totaling a formwork area of 14,200 m².

The Shoreline apartments are located at the “trunk” or hub of the Palm with theme parks, marinas, shopping malls and restaurants.

Aluma Systems continues to expand its project base within the Dubai construction market. Aluma Systems’ projects in Dubai include: the HSA Residential & Hotel development for Meridien, the Burg Dubai Residents Project, the Gate Project at the Dubai Finance Centre and the Dubai Marina.

“The market in the UAE has changed dramatically, in that the construction market was price driven due to cheap and plentiful labor. The labor pool has tightened considerably, costs have risen, and efficiencies and timetables have become ever more demanding. Now, contractors and developers are insisting on the signature efficiencies long associated with Aluma Systems’ technologies, equipment and solutions,” stated Terry Taylor, Aluma Systems’ General Manager, Middle East.

Aluma Systems, based in Toronto, Canada, was founded in 1972, is one of the largest industrial scaffolding and concrete construction services companies with annual revenues more than $ 250 MM. The company’s two divisions, Concrete Construction (CC) and Industrial Scaffolding Services (ISS) serve scores of industries worldwide. Aluma Systems CC delivers high-efficiency forming and shoring equipment with unrivaled engineering expertise to global projects ranging from high-rise towers, airports and parking garages to dams, stadiums, bridges, transit systems and water treatment plants. Aluma Systems ISS serves refineries, chemical processing plants, shipyards, power plants, pulp and paper mills, marine maintenance, offshore oil rigs, mining and industrial construction. Aluma Systems, an award winning industry leader in safety, innovation and quality, has 32 offices worldwide and a growing international network of alliances in 50 countries. For further information on Aluma Systems and its services go to its homepage: www.aluma.com.
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