

• S O U T H E A S T • A S I A •

# CONSTRUCTION

JANUARY - FEBRUARY 2017

## Cover Story:

Singapore residential projects  
built with PBUs

## Features:

Expansion of Greens Port in Texas  
Liebherr relaunches rough-terrain cranes  
Volvo shares futuristic machines  
ITA Tunnelling Awards 2016  
Market Talk: JCB



Preview




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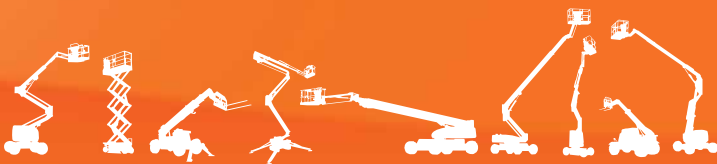
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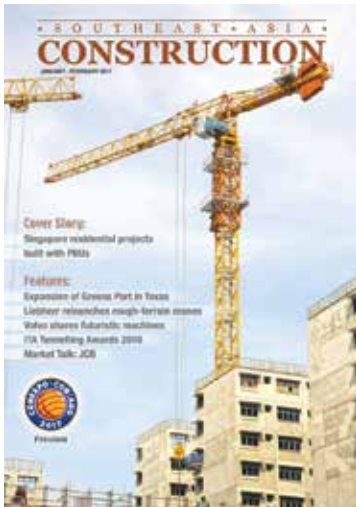
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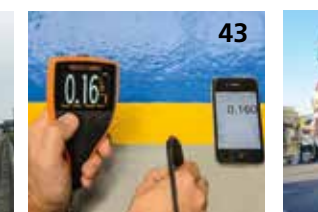
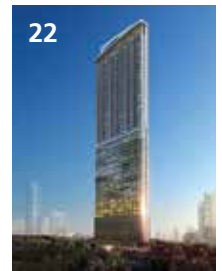
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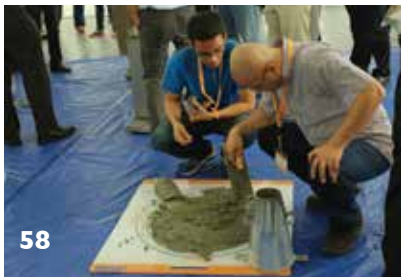
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## Lendlease's S\$3.2 bil urban regeneration project

Lendlease has recently unveiled its new, urban regeneration mixed-use development in Singapore, Paya Lebar Quarter. Planned to be completed in phases with retail and commercial in the second half of 2018 and residential in the first half of 2019, the project will be a significant landmark of Urban Redevelopment Authority's (URA) 12-ha Paya Lebar Central development.

Located just 10 minutes from the CBD by car or train, the 3.9-ha Paya Lebar Quarter is sited next to the Paya Lebar MRT interchange. Aligned with Singapore's vision to be a car-lite city, it is one of the first developments to incorporate a cycling path within the precinct that facilitates a continuous connection to the wider Park Connector Network.

Paya Lebar Quarter will include a mall with 200 retail shops, three Grade A office towers featuring close to 1 mil sq ft of work space, and Park Place Residences that comprises three towers with 429 units. The development is expected to serve a working population of 22,000 in the local catchment area within seven minutes' walk and approximately one million residents in the trade area. When the wider Paya Lebar Central precinct is fully developed, Paya Lebar Quarter is expected to have around 52,000 workers in its immediate catchment.

"Urban regeneration is a key pillar of Lendlease's strategy and it comprises over 70 percent of Lendlease's S\$49.3 billion international development pipeline. With its central location, Paya Lebar Quarter will lead the way in regenerating the area and will turn it into a vibrant hub offering a new and dynamic city life," said Richard Paine, managing director of Paya Lebar Quarter.

The Paya Lebar Quarter architecture responds the area's heritage with inspiration drawn from the intricate weaving patterns of the 'songket', a traditional brocade textile of the Malay culture; the design language and gold-and-silver colour palette for the facade seek to unify the buildings and public areas to seamlessly weave the seven buildings into a single tapestry.

Lendlease said it has been closely engaged with community stakeholders since the start of the planning for Paya Lebar Quarter, to ensure that its design enables social inclusivity and builds community heartware, an increasingly important consideration as cities urbanise. One of the highlights of Paya Lebar Quarter is the 100,000 sq ft of green public spaces (estimated to be the size of more than 20 basketball courts), where the community can get together through spontaneous interactions and collective celebrations among those who live, work and play at Paya Lebar Quarter. In addition, there will be a covered outdoor event space, which will also help enhance a strong community spirit and culture by hosting large scale celebratory, festive and community events.



Top and above: Lendlease's S\$3.2 bil Paya Lebar Quarter urban regeneration project will be a significant landmark of URA's 12-ha Paya Lebar Central development.

"We are glad that the distinctive cultural heritage and community spirit of this area is reflected in Paya Lebar Quarter," said Prof Fatimah Lateef, Member of Parliament (MP) for Marine Parade Group Representation Constituency (GRC) for the ward of Geylang Serai. "The development complements and adds to the revitalisation of the precinct as well as the dynamism of the area. It will complement the adjacent development of Wisma Geylang Serai, due for completion in 2018. This area will be a new place for the community to hangout and to own. It is befitting as a location in the Geylang-Paya Lebar sub-regional centre."

Paya Lebar Quarter's sustainability vision focuses on building an Active, Green and Engaged environment for people who live, work and play there. It is on track towards being the first development to achieve the BCA Green Mark 2015 Platinum rating. ■

## Huatong to deliver three civil engineering contracts in Singapore

Huatong Contractor Pte Ltd, a wholly owned subsidiary of Huatong Global Limited, has secured three new civil engineering contracts from the Housing & Development Board of Singapore (HDB) totalling approximately S\$26.6 million. The company is expected to deliver the projects in phases over the next two years.

The new contracts include a project at Bukit Batok estate (with several work scopes including earthworks and slope formation at Bukit Batok N4, widening of Bukit Batok West Avenue 2 and construction of Bukit Batok West Avenue 5 (extension) and Bukit Batok West Avenue 8, and relocation of bus bay and bus shelter at

Bukit Batok Road); site clearance and earthworks for Defu Industrial City; and earthworks and construction of Punggol Drive.

"Times are challenging for the construction sector, but there is still a strong pipeline of public sector projects in areas such as housing and neighbourhood upgrading, MRT and transport infrastructure, and utilities. We believe Huatong Global's rich experience in public civil engineering works puts us in a good position to tap into this pipeline. We will continue to actively pursue opportunities to grow our order book," said Patrick Ng, CEO of Huatong Global. ■

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## AECOM secures HKIA's new passenger building project

AECOM has been awarded the detailed design consultancy work for Hong Kong International Airport's (HKIA) new passenger building, part of the HK\$141.5 billion Three-Runway System (3RS) project.

With a floor area of 280,000 sq m, the new facility will have various features such as a courtyard at the centre of the building with lush landscaping. The design will also incorporate natural light and views in order to improve the experience for the passenger and help reduce energy, adding to the sustainable design credentials for the concourse.

The Third Runway Passenger Building, in its primary phase, will have 57 aircraft parking positions and will be able to handle 30 million passengers each year together with the modified Terminal 2. It is a vital component of the 3RS project, which will help maintain and strengthen Hong Kong's competitiveness as an international hub.

AECOM's team with its partners will research and conduct benchmarking studies that will assist the design team working with the client to deliver an excellent passenger facility. The studies will look at the future trends in information technology and airport systems, retail and advertising. Work has commenced and construction is expected to be completed in 2024. ■



AECOM will carry out the detailed design consultancy work for HKIA's new passenger building.

## New dealer for Bobcat compact equipment in the Philippines

Doosan-Bobcat has appointed Civic Merchandising Inc as its new dealer in the Philippines for Bobcat range of compact equipment. The company also holds dealership for Doosan brand (formally known as Ingersoll-Rand) of portable compressors and generators.

With Bobcat compact machinery and Doosan portable equipment under one roof, Civic is positioning itself as a leading compact and portable equipment specialist in the Philippines. The company is now able to serve a greater variety of customers across the country with a wider range of products, and in more diverse industries such as construction/infrastructure, agriculture, landscaping, animal farms, recycling, oil and gas, mining, utility, power generation, shipbuilding and repairs, cement, forestry, military and more.

Established in 1974, Civic Merchandising started as an independent dealer for heavy equipment spare parts. In 1980, the company expanded its operations to include sales of used equipment, and a few years later it began offering brand new machines. Since its foundation, Civic has grown from a three-man business to a corporation with over 650 employees. ■



The Doosan-Bocat team at Civic Merchandising.

## Ascendas-Singbridge to redevelop former CPF building in Singapore

Ascendas-Singbridge has entered into a joint venture with Mitsui and Tokyo Tatemono to redevelop the former CPF Building in Singapore, located at 79 Robinson Road, into a Grade-A office building with retail amenities. Ascendas-Singbridge and a consortium formed by Mitsui and Tokyo Tatemono (Mitsui – Tatemono JV) will hold 65 percent and 35 percent stakes respectively in the joint venture company Southernwood Property Pte Ltd. Under the partnership, Ascendas-Singbridge and the Mitsui – Tatemono JV will own, develop and manage the project.

The 47,050 sq ft site has a potential gross floor area of approximately 617,850 sq ft. The new development will feature

over 500,000 sq ft of prime Grade-A office space, catering to clients in Information Technology, Communications & Media, Banking, Finance and Insurance and those in Professional and Business Services. It is expected to accommodate the evolving workspace needs of local and international businesses, as well as that of a growing millennial workforce. Total development cost for the project is estimated at S\$1 billion.

The existing building will be decommissioned and development works are planned to commence in the second quarter of 2017. Construction is expected to complete by 2020. ■



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## Terex Trucks strengthens in Malaysia with new dealer

Terex Trucks has appointed Volvo Malaysia Sdn Bhd as its official dealer in Malaysia, further strengthening its dealer footprint and supporting customers in the Southeast Asia region.

Volvo Malaysia is a leader in the distribution, sale and support of construction equipment for mining and quarrying throughout East and Peninsular Malaysia. To boost its offering to customers in these segments the company will add all four of Terex Trucks' rigid haulers – the TR45, TR60, TR70 and TR100 – to its portfolio.

“Terex Trucks is a perfect fit for our business, as the addition of the rigid haulers complements the existing range of equipment that Volvo Malaysia carries, while at the same time driving Terex Trucks penetration into an exciting market,” said Wee Kim Wei, business director at Volvo CE Malaysia.

Malaysia's economy, which is the fourth largest in Southeast Asia, is both vibrant and relatively diversified. Once the world's biggest producer of tin, the nation enjoys ample oil and gas reserves, as well as natural resources, such as rubber and palm oil, forestry and minerals. With the construction sector strengthening, Malaysia also has varied opportunities for rigid dump trucks, which is where Terex Trucks' versatile machines come in.

Built on simplicity, the Scotland-built rigid trucks offer payloads that range from 41 to 91 t. The robust machines provide a good balance of power, effective gearing and optimum weight distribution to move material efficiently over the toughest terrains. They also deliver excellent rimpull, thanks to a resilient drivetrain and rear axle configuration.

Clement Cheong, director of sales and marketing APAC at Terex Trucks, said, “It is a natural progression for Terex Trucks to collaborate with Volvo Malaysia as we can go to the market with a complete range of equipment to serve the mining and quarrying segment in the country. Volvo Malaysia has been making progressive investments; in October, the Johor branch was inaugurated, making five branches in Malaysia. We are confident that Volvo Malaysia will drive Terex Trucks penetration and provide excellent customer support with its branch network.” ■



Terex Trucks TR70 rigid haulers (above), along with the other three models - TR45, TR60 and TR100 - are now available in the Malaysian market through Volvo Malaysia Sdn Bhd.

## Kobelco's 500th crawler crane for Sin Heng

Kobelco has passed another milestone in Singapore with the delivery of its 500th crawler crane to Sin Heng Heavy Machinery Limited. Both parties recently celebrated this landmark achievement at Kobelco factory in Okubo, Japan.

In 2010 Sin Heng was appointed as one of Kobelco crawler crane distributors in Singapore. Founded in 1969, Sin Heng possesses many years of experience in the local crane market and has built an extensive network of customers.

“We are privileged to be able to contribute to this great achievement and be part of this historic crawler crane growth cycle through Sin Heng. It reflects the market confidence of our Kobelco crawler crane products and Sin Heng's dedication and support to our valued customers,” said Takemichi Hirakawa, managing director of Kobelco Cranes South East Asia Pte Ltd. The company is a subsidiary of Kobelco Construction Machinery Co Ltd.

Tan Ah Lye, chairman of Sin Heng Heavy Machinery Limited said, “We are proud to accomplish this landmark achievement. Our highest appreciation to Kobelco for their strong support and collaboration. We would also like to thank our supportive customers for their continued patronage and valuable feedback. We will continue to open up new grounds and opportunities and progress towards greater success with all our valued partners.” ■



Kobelco celebrates its 500th crawler crane for Sin Heng.

## Black & Veatch to work on major water project in Western Australia

Black & Veatch, in a joint venture with Cimec (BVCJV), will upgrade and expand one of Western Australia's largest wastewater treatment plants. The EPC (Engineering, Procurement and Construction) alliance contract with the Water Corporation will see Black & Veatch return to Woodman Point Wastewater Treatment Plant, located 22 km south of Perth. The contract was scheduled to commence in November 2016, with the work to be completed by end of 2019.

The plant's treatment capacity will increase from 140 to 180 mil l/ day, and serve 900,000 people when completed. The upgrade also comprises expansion of existing odour collection and treatment systems; new grit removal facility; new flow distribution channel; new sedimentation tanks; and conversion of the existing batch reactor to a permanent aeration facility. ■

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## JCB partners with DKSH in Thailand

JCB has appointed DKSH as its market expansion services provider in Thailand. This new partnership will provide sales, parts and service support for the full line of JCB machines, and consequently assist JCB in expanding its market reach in Thailand.

DKSH will support JCB in providing business solutions across the construction, quarrying, mining, government and agricultural segments in Thailand. The new partnership will carry a wide range of high-quality and robust construction machinery, including backhoe loaders, tracked excavators, compact excavators, skid steer loaders, telescopic handlers, wheel loading shovels and compactors. DKSH will provide world-class solutions to JCB's Thailand customers, thanks to its experience in the construction market, and its demonstrated capabilities in after-sales services and maintenance.

The new dealership's main base will be in Wangnoi, with additional branches in Suratthani, Khon Kaen and Lampang. The collaboration between JCB and DKSH will provide customers with a wide-reaching and extensive customer service package. This includes a range of technologically-focused service management tools, one being GPS tracking to determine when a job has been opened or finished at a customer's site. The tools can also provide location tracking and allow DKSH to calculate their response rate after every case has been closed. The partnership will also provide a call centre for its customers, which will be available seven days a week for eight hours each day.

"DKSH has been home in Thailand since 1906, while JCB is already a well-established, reputable brand in the industry. We are



DKSH has been chosen as JCB's market expansion services provider in Thailand.

delighted to be partnering with them to provide a structured approach in penetrating the promising Thai market," said Jareuk Meekhanthong, VP for Business Unit Technology at DKSH Thailand.

Tom Cornell, managing director of JCB Southeast Asia, said, "Thailand is JCB's number one market in Southeast Asia and we are delighted to have DKSH as our partner for growth. DKSH brings along tremendous amount of sales and service experience in the construction, quarrying and mining segments and we look forward to working with them closely." ■

## Aver Asia to train ITE students

Aver Asia, a Singapore-based access rental company, has signed a Memorandum of Understanding (MOU) with the Institute of Technical Education (ITE) and International Powered Access Federation (IPAF) to establish a joint training centre in ITE College West, providing specialised training in the use of mobile elevating work platforms (MEWPs).

The MOU aims to promote training and development in the area of workplace safety and health for ITE students and staff. Under the agreement, Aver Asia will provide and maintain the equipment, as well as provide training and certification for ITE students, at no cost to the other parties. In return, ITE will provide Aver Asia and IPAF access to the equipment and facilities at the ITE premises. IPAF will facilitate the use of its MEWP operator training programme and PAL Card (Powered Access Licence) certification.



The MOU goes beyond training and promotes continuous development through internship places for ITE students, and book prizes and outstanding student awards for ITE Facility Management and Engineering students. It will also facilitate the transfer of knowledge and sharing of good practice in the area of MEWP operations and training, through conferences, seminars and attachment opportunities for ITE staff at Aver Asia and IPAF-managed facilities. ■

One of the machines to be used for training, a Genie aerial platform, is seen here at the joint training centre in ITE College West.

## Work on Sydney hotel starts

M&L Hospitality, a Singapore-based real estate investment group, has started the development of its new hotel at 65 Sussex Street in Sydney, Australia. Multiplex has been commissioned to build the hotel, which is due for completion in the fourth quarter of 2017. Designed by Architects Fitzpatrick + Partners, the mid-scale hotel property is located in the central business district and will boast an eight-level tower with a distinctive geometric facade, 182 guest rooms including four suites, an internal courtyard, meeting space, restaurant and bar. ■



An artist's impression of the new hotel at 65 Sussex Street, Sydney. It is due for completion in 2017.



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## Manitou officially opens Malaysia facility

Manitou recently celebrated the official opening of its new office in Malaysia. The 900 sq m site located in Sungai Buloh has been operating since January 2016, where it provides both sales and rental of the company's products. Other support services such as repair services, service contracts, extended warranty and financing are also available.

Manitou has been present in Malaysia for nearly 20 years through a local partner, and the company has experienced a positive growth in the market. "We see Malaysia as a great potential especially with a large fleet of telescopic handlers. As a fast developing nation, we see Manitou's presence as timely because of the potential market of its sectors, which require all-terrain material handling equipment," said Julien Poupart, operations manager of Manitou Malaysia.

According to Manitou, Malaysia represents the second largest fleet of Manitou telescopic handlers in Asia and therefore, it requires a commercial presence and increased provision of services on site. "The opening of this office in Malaysia is very important for the development of Manitou's services and solutions offered to our customers at their doorstep," said Mr Poupart. "We want to provide them with a service adapted to their requirements. In particular, we have a rental fleet of new telehandlers with various heights to enable our customers develop their activities with the latest generation equipment."

Among the machines targeted at the market are the Manitou Man'go 12 platforms, Manitou MHT-X 790 telescopic handlers and Gehl R260 skid steer loaders. These rough terrain machines can be used in different industries. ■



Above and left: Manitou celebrates the official opening of its new office in Malaysia.

## Carmix reaches milestone in India

Italian company Carmix has sold its 100th mobile concrete batching plant in India, reaching its first important milestone in the country. "These are definitely extraordinary results, thanks to good quality, high versatility and avant-garde tools that render Carmix's self-loading cement mixer trucks essential to facing up to even the toughest of construction jobs and extreme work scenarios," said Manuela Galante, marketing director of Carmix.

"India is a rapidly developing place and we are certain that in the near future we'll be able to increase our production to meet the requirements of an ever more demanding and competitive market like that of India," she added.

Carmix small mobile concrete batching plants are sold in 155 countries worldwide and used in five continents. In 2014 the company formed a joint venture with Apollo Concrete Solutions, creating Apollo Carmix Equipments Ltd, which manages the production and sales of Carmix models in India.

There are currently two models produced for the Indian market, Apollo Carmix 25 FX and Apollo Carmix 4TT. Compact and reliable, they are equipped with four-wheel steering and a user-friendly driver system. Featuring low maintenance costs and high reliability, safety and agility index, these machines are ideal for all jobsites that require a small amount of concrete. ■



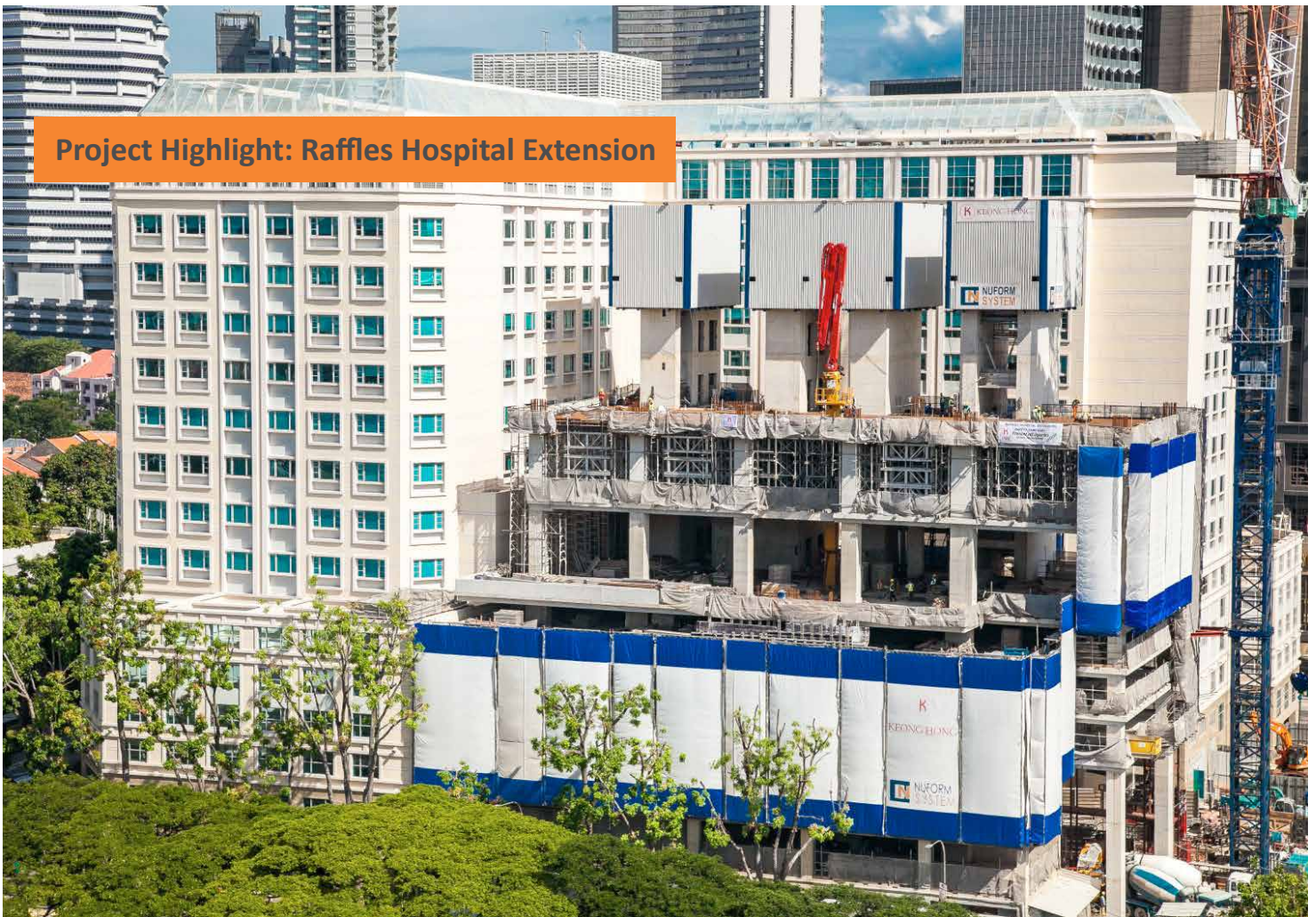
Carmix has reached a milestone in India with the sale of its 100th mobile concrete batching plant.

## SMEC wins road design project in Australia

SMEC has been engaged by VicRoads to prepare concept and detailed engineering design for the Streamlining Hoddle Street Project in Melbourne, Australia. The project is the first stage of the Victorian Government's planned transformation of Hoddle Street, which aims to improve the journey along and across Hoddle Street for all road users and introduce innovative intelligent transport systems and urban design initiatives along one of Melbourne's busiest arterial roads.

As part of this pioneering approach, SMEC will lead its project partners Advisian, Nation Partners and BECA to deliver Australia's first Continuous Flow Intersection (CFI) at the Hoddle Street and Swan Street intersection. CFIs eliminate left and right turns at main junctions, instead have dedicated turning lanes that redirect turning traffic prior to reaching the main intersection.

SMEC's scope of works includes: intersection design at Eastern Freeway, Johnston Street, Brunton Avenue and Swan Street; transport modelling; urban design; Intelligent Transport System (ITS) design; and stakeholder engagement. ■

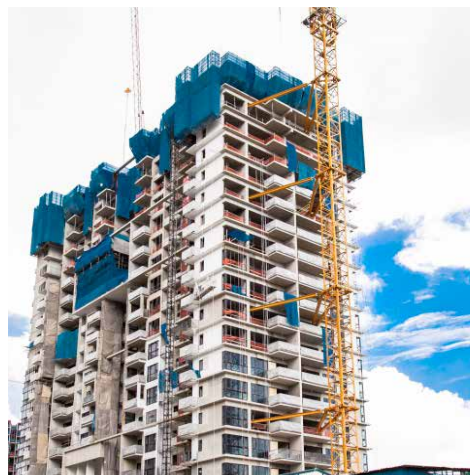


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## McCloskey's new dealer in China

McCloskey International is expanding its global distribution network in Asia with the appointment of a new dealer, Shanghai Shibang Machinery (SBM) for the Chinese market. SBM has also acquired a McCloskey machine, an S190 triple deck screener.

Founded in 1987, SBM is a global crushing equipment manufacturer based in Shanghai, with nearly 1,300 employees located in around 16 countries. In the past 30 years, the company has been devoted to producing mining equipment, aggregates equipment and industrial grinding mills. With the advantages of high efficiency and low maintenance cost, its products have been widely used in the construction and mining industry both at home and abroad.

"McCloskey has a very good reputation in the industry," said Libo Fang, SBM's vice general manager. "The products are very

competitive both in quality and price, and can be a complementary product for SBM. Our ambition is to drive the industry development by delivering reliable and sustainable products and services in mining, aggregates and grinding industries. Our customers' needs derive from certain global trends – urbanisation and the growing demand for minerals – these are what drive us."

"Asia is a growing market for McCloskey's crushing and screening equipment, and a partnership with SBM will allow us to continue our rapid growth in the region," said Paschal McCloskey, president and CEO of McCloskey International. "Their commitment to their customers lines up with ours, and we look forward to working with them to round out their product offerings to the market. ■



Shanghai Shibang Machinery's factory.

## China State Construction wins Dubai project

DAMAC Properties has awarded China State Construction Engineering Corporation a AED 554 million contract to build the Paramount Residences at the Paramount Tower Hotel & Residences in Dubai. The contractor won the main work contract for 27 floors that comprise a collection of luxury residences.

The 64-storey Paramount Tower Hotel & Residences (below) is located on Sheikh Zayed Road. It is scheduled for completion in 2020. The architect on the project is LACASA Architects and Engineering Consultants. ■



## Manitowoc has new leaders for Asia and Middle East

Manitowoc has made two senior appointments for the Asia and Middle East region. Christophe Simoncelli takes on the new role of vice president, tower crane sales, Asia and the Middle East, while David Semple is senior vice president, mobile cranes, Asia and the Middle East.

Both Mr Semple and Mr Simoncelli have close to 20 years of experience at Manitowoc, working primarily in sales and general management functions across the company's product lines. Mr Simoncelli was previously vice president of sales for Western Europe and French-speaking Africa. He has relocated from France to Singapore, and has also assumed the role of general manager for the company's regional headquarters in the country. Mr Semple was previously vice president of sales for the Middle East and English-speaking Africa, and will remain based in Dubai.

The new roles have been created in alignment with Manitowoc's recent reorganisation, which saw its tower crane activities operated independently from its mobile crane and crawler crane operations. From a regional perspective, the company's sales and marketing activities for Asia were also combined with those of the Middle East.

The respective tower crane and mobile crane organisations



Far left: Christophe Simoncelli.

Left: David Semple.

will cover a range of customer-facing activities, including: sales of new and used cranes; spare parts sales; rental sales; field service activities; marketing support; and marketing communications. Manitowoc's reorganisation of its operations will help the company bring more focus, greater innovation and increased velocity to its activities, all with the goal of delivering stronger value to customers.

Following the reorganisation, Jack Lee, long-standing general manager of Crane Care in Asia, has announced his retirement. Raman Joshi, former executive vice president for Asia Pacific, has also left the company. ■

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## New, innovative office building in Jeddah

A new, innovative office building is currently under construction in Jeddah, Saudi Arabia. The Abdul Latif Jameel Corporate Headquarters is envisaged as an open-plan, social office that will house 2,300 staff when completed. The company commissioned Aedas to design the building and Aurecon was appointed as the structural engineers.

“The client’s vision was for the facility to provide various social interaction zones through a bright, open and flexible layout. Such designs are uncommon in Saudi Arabia, where intense heat means that building designs are dictated by the need for thermal comfort, rather than space or brightness,” said Andrew Bromberg of Aedas.

To create the bright, open spaces in this challenging environment, Aedas oriented the L-shaped building so that the solid face of the building faces west, thus bearing the brunt of the intense afternoon sun, which can hit above 40°C.

The building’s tapered L-shaped structure meant that Aurecon’s structural engineers had to devise a tailored support structure that would not compromise the design vision of an open-plan space. “The L-shaped office areas are arranged in a manner which gives the architectural tapering effect - both legs of the L-shape are arranged slightly differently from the adjacent floors. This created an intriguing challenge in determining the column layout to suit the open plan office and also integrating it with the car park layout in the basement,” said Andy Mak, principal structural engineer at Aurecon.

Aurecon developed sophisticated models using Revit design software and worked to integrate that with Aedas’ models produced using the Rhino platform. “We went through many iterations of overlaying the Revit model and the Rhino model to coordinate the optimum column arrangement,” said Mr Mak. “In the end we decided on inclined and kinked columns on one leg of the L shape. This worked very well with the interior architecture and also avoided major transfer beams in the floors.”

The link bridges were an integral part of the design and the key visual element in the atrium space. “For architecture, the bridges are a key visual element in the atrium space. But they also provided the only route to get building services into the office space. Structurally we used the link bridges to anchor the L-shaped floors back into the large lift shafts, meaning that horizontal forces induced by the kinked columns and all of the seismic storey shear forces had to be channelled through the four link bridges on each floor,” said Mr Mak.



© AEDAS

Abdul Latif Jameel’s new HQ in Jeddah, Saudi Arabia, will offer one of the most innovative working environments in the region.

Mr Mak also noted that the strength and stiffness of the structure was provided by the use of high-strength reinforced concrete. However, for the building’s office floors, post-tensioned concrete was used, as it could better withstand the tension from the tapered columns, building a stronger connection between office floors and elevator shafts.

Another significant challenge encountered by Aurecon during the building process was the absence of solid bedrock beneath the site. Unusually for Jeddah, where bedrock is usually found at relatively shallow depths, the building sits on top of dense sand where the bedrock is more than 60 m below ground. The site is located at a dip in the bedrock where the Hijaz Mountains meet the Red Sea, and this site condition meant that long friction piles were required to support the loads of the building.

“To minimise the loads onto the piles, we conducted soil structure interaction analysis, incorporating the piles and soil into our structural analysis model,” explained Mr Mak. “This facilitated the design of a piled raft foundation system where 20 percent of the foundation load was shed from the piles into the ground bearing raft, delivering a more efficient design.”

When completed, the new headquarters building will rise to more than 100 m high. It is located on the northwest corner of a 21-ha site adjacent to a major traffic intersection in Al-Balad, the historical area of Jeddah. ■

## Volvo CE appoints new dealer in Vietnam

Volvo Construction Equipment (CE) has appointed T&C Machinery and Parts as its new authorised dealer for Volvo branded construction equipment in Vietnam.

T&C Group is a dynamic group of Vietnamese companies, providing products and services within various businesses, including heavy equipment, automotive and logistics. With extensive experience in the Vietnamese mining and construction equipment business, and strong presence across the country, T&C will support the growing number of Volvo CE customers.



“T&C is a very strong and respected partner and we are very pleased to join forces with them as we continue to drive our presence in Vietnam, with strong focus on customer support and a strengthened market position. With Volvo’s broad product range we will be able to make a significant contribution to the development of Vietnamese society and infrastructure going forward,” said Roger Tan, VP of Volvo CE, Hub Southeast Asia. ■

T&C is now a Volvo dealer in Vietnam.

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As of April 1st 2016, Kobelco Construction Machinery and Kobelco Cranes merged their management organizations to form Kobelco Construction Machinery Co., Ltd.

## Bruce Shaw to be renamed Linesight

International construction consultancy firm, Bruce Shaw, will change its name to Linesight as part of its new global strategic plan. The company is headquartered in Ireland, providing professional services, management support and strategic advice to the construction industry. It has continued to grow and currently operates in over 40 markets worldwide across multiple sectors, including commercial, data centres, life sciences, high tech industrial, hospitality, healthcare, education, residential and retail. In response to this ongoing expansion, the business now requires a name that can be owned outright in all markets and sectors in which it operates, to allow it market as one brand.

In Singapore, Linesight plays a key role in enabling the US\$1,265 billion data centre market by managing construction costs and project control and management. The company also brings its experience in creating energy-efficient data centres to the local market. In addition,

Linesight is active in growing Singapore's biomedical technology sector and is expanding its presence by supporting commercial and leisure developments locally. Beyond Singapore, the company has done work in Malaysia, Vietnam and China as well.

"Singapore serves as our hub in the region and will continue to do so for many years to come," said John Butler, managing director for Asia Pacific at Linesight. "This is an exciting time for the company as we continue to grow and strengthen our market leading position in Asia."

Mr Butler also said that three quarters of the company's business in Asia comes from clients Linesight has partnered with before. "This is testament to the strength of our talent, solutions-based approach, deep trusted relationship and commitment to our clients. We will continue to honour these same values as Linesight moving forward." ■

## Terex Cranes appoints new key executives

Steve Filipov has been appointed as president of Terex Cranes, replacing Ken Lousberg who will be leaving the company to pursue other opportunities. Mr Filipov will also continue with his responsibilities as president of Terex Material Handling and Port Solutions until completion of the sale of this segment to Konecranes Plc.

"We thank Ken for his dedicated service and leadership over many years within the AWP segment, Terex China and his current position with Terex Cranes, and wish him the best in his future endeavours," said John L. Garrison, Jr, president and CEO of Terex Corporation.

Commenting on the new assignment for Mr Filipov, Mr Garrison said, "Steve is the right person to lead the turnaround efforts to improve our global cranes business. Steve started his career at Terex in the company's crane business and served as president of Terex Cranes from 2004 to 2008. Steve's intimate knowledge of the Terex Cranes business, its products and, most importantly, its customers will put him in an excellent position to start immediately with the work of improving and growing our cranes business. Steve has demonstrated strong leadership skills during his tenure with Terex and I am confident that in his new responsibility as president of Terex Cranes he will serve us and our customers well."

Mr Garrison also said that Kevin O'Reilly, currently vice president of Operational Finance at Terex Corporation, will assume the position of group vice president of Finance for Terex Cranes, assisting Mr Garrison with the turnaround.

### New directors for crawler cranes and technology platforms

Terex Cranes has also appointed Ingo Nöske as its director product management for crawler cranes and Dr Ascan Klein as its director of competency centre technology platforms.

In his new capacity, Mr Nöske will lead the global product management teams for the Demag and Terex crawler crane lines as they work closely with customers to ensure products are developed to meet their current and future needs. Mr Nöske will also manage the development and execution of product line strategies.

With 20 years of crane engineering experience, Mr Nöske returns to Terex Cranes after working with two global crane equipment



Steve Filipov.



Ascan Klein.



Ingo Nöske.

manufacturers, where he has held several management positions, including managing engineering product development and, most recently, globally directing crawler crane product development. Prior to departing Terex Cranes in 2008, he worked in the Zweibrücken factory as chief engineer development and project manager lattice booms.

Meanwhile, Dr Klein's role is to drive common approaches for crane equipment software, electronics, hydraulics and load management, where technology commonality throughout the product lines will benefit Terex Cranes' customers globally.

Dr Klein's deep engineering experience in the crane industry spans a career of more than 16 years. He rejoins Terex Cranes, where he held multiple leadership positions in engineering until 2011. He has spent the last five years with a multinational crane equipment manufacturer, where he held various management positions focusing on product innovation. Most recently his management skills were put to use in a global capacity in the area of advancing excellence for control systems.

The Engineering Competency Centres serve as cornerstones to Terex Cranes' new and enhanced product engineering, development and management programme. These centres develop common approaches to technology platforms i.e. crane controls and componentry, which are then leveraged by local engineering teams to address local customer feedback, improve service response time and drive new product development. ■

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## Chernobyl arch reaches resting place

The sliding operation of Chernobyl's New Safe Confinement in Ukraine was recently completed, marking a key milestone before the finalisation of the international programme to transform Chernobyl into an environmentally safe and secure state by November 2017.

Thirty years after the nuclear disaster in Chernobyl, the radioactive remains of the power plant's destroyed reactor 4 have been safely enclosed following one of the world's most ambitious engineering projects.

Chernobyl's giant New Safe Confinement (NSC) was moved over a distance of 327 m from its assembly point to its final resting place, completely enclosing a previous makeshift shelter that was hastily assembled immediately after the 1986 accident.

The equipment in the New Safe Confinement will now be connected to the new technological building, which will serve as a control room for future operations inside the arch. The New Safe Confinement will be sealed off from the environment hermetically. Finally, after intensive testing of all equipment and commissioning, handover of the New Safe Confinement to the Chernobyl Nuclear Power Plant administration is expected in November 2017.

The Chernobyl arch is reportedly the largest moveable land-based structure ever built, with a span of 257 m, a length of 162 m, a height of 108 m and a total weight of 36,000 t equipped. It will make the accident site safe and with a lifetime of 100 years allow for the eventual dismantling of the ageing makeshift shelter from 1986 and the management of the radioactive waste.

The structure was built by Novarka, a consortium of the French construction firms Vinci Construction and Bouygues Construction. Works started in 2010.

With a cost of €1.5 billion, the giant structure is said to be the most prominent element of the Shelter Implementation Plan for Chernobyl, which involved more than 300 projects and activities. The €2.1 billion programme is financed by the Chernobyl Shelter Fund. Established in 1997, the Fund has received more than €1.5 billion from 45 donors to date. The European for Reconstruction and Development (EBRD) manages the Fund and is the largest contributor to the New Safe Confinement project.

Sir Suma Chakrabarti, president of EBRD, said, "We welcome this milestone in the process of the transformation of Chernobyl as



Chernobyl's New Safe Confinement.

a symbol of what we can achieve jointly with strong, determined and long-term commitment. We applaud our Ukrainian partners and the contractor and we thank all donors to the Chernobyl Shelter Fund whose contributions have made today's success possible. The spirit of cooperation gives us confidence that the project will be completed on time and within budget a year from now."

Novarka's project director Nicolas Caille, commented, "We are very proud to have been able to actively contribute to meeting this one-of-a-kind technological challenge. The New Safe Confinement at Chernobyl is a feat of engineering that will ensure optimal safety conditions for the Ukrainian people for the next 100 years. I would like to take this opportunity to commend the achievement of the teams of the Novarka joint venture formed by major French groups Vinci Construction and Bouygues Construction."

Igor Gramotkin, director general of the Chernobyl Nuclear Power Plant, added, "We were not building this arch for ourselves. We were building it for our children, for our grandchildren and for our great-grandchildren. This is our contribution to the future, in line with our responsibility for those who will come after us." ■

## New CEO for Rolls-Royce Power Systems



Andreas Schell (left) has been appointed as CEO of Rolls-Royce Power Systems, starting 1 January 2017. He is succeeding Dr Ulrich Dohle, who will be retiring soon.

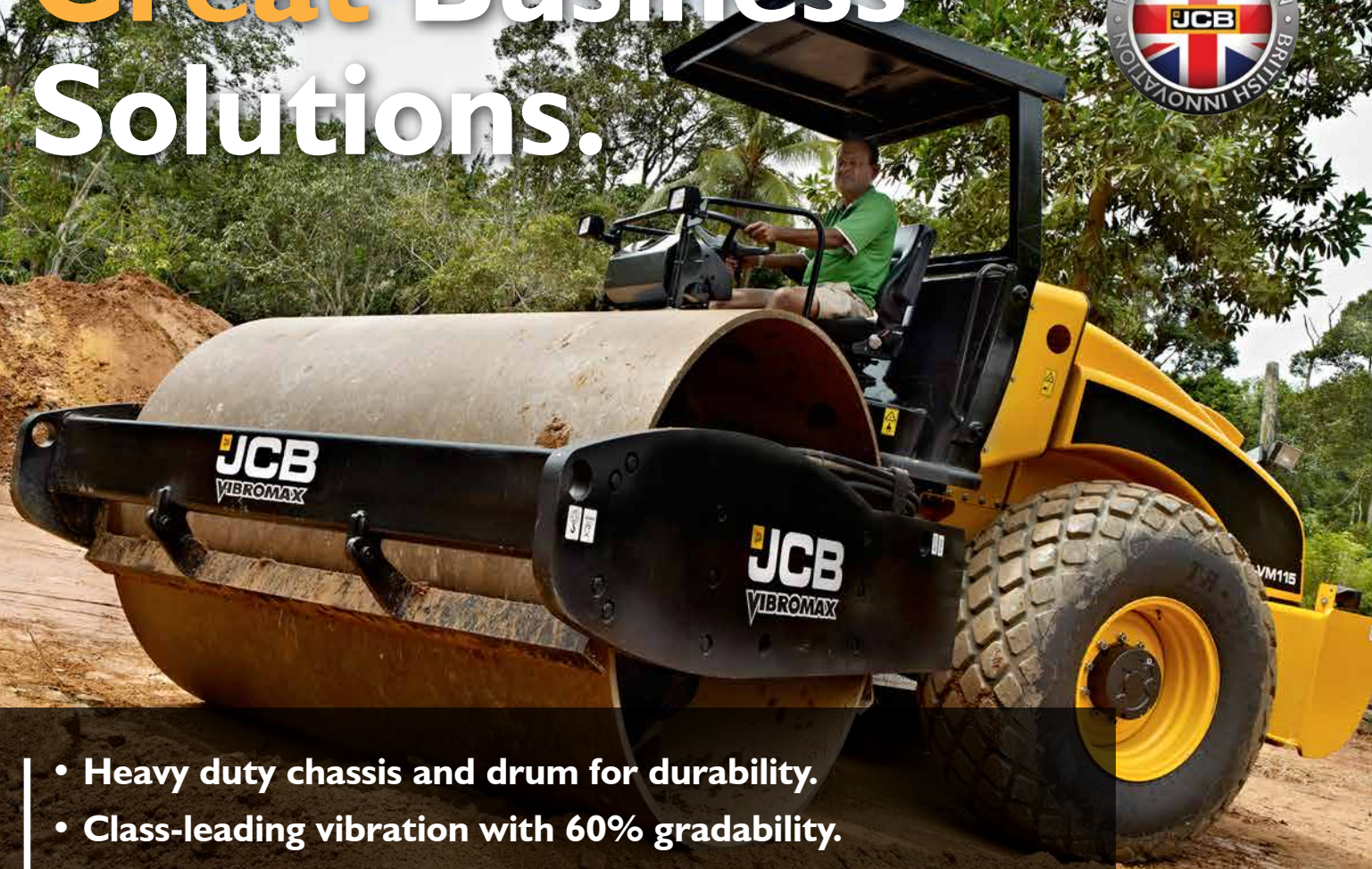
Mr Schell has a wealth of international leadership expertise, running large complex organisations involved in high-technology engineering across a number of sectors including aerospace and automotive in Germany, the UK and US. He has experience in operational transformation programmes, strategy and the development of new business models, products and markets.

Most recently, Mr Schell was vice president of digital strategy for UTC Aerospace Systems with responsibility for creating new digital tools and services. He joined UTC in 2009 as vice president

of engineering for Aerospace Power Systems, before being appointed as president for Electric Systems and then president for Actuation & Propeller Systems. Previously Mr Schell worked at Chrysler, where he held a number of positions including vice president for Electrical and Electronics Core Engineering and was responsible for developing and releasing electric systems for the Chrysler, Jeep and Dodge product lines. He was also responsible for hybrid development, fuel cell systems and advanced vehicle engineering at DaimlerChrysler. He began his career as a development engineer at Daimler-Benz in 1996.

Rolls-Royce Power Systems is headquartered in Friedrichshafen in southern Germany and employs around 10,000 people. The product portfolio includes MTU-brand high-speed engines and propulsion systems for ships, power generation, heavy land, rail and defence vehicles and for the oil and gas industry. ■

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## Dana to purchase Brevini businesses

Dana has signed an agreement to purchase the power-transmission and fluid power businesses of Brevini Group SpA. Under terms of the agreements, Dana plans to initially purchase an 80 percent share in the Brevini businesses, with an option to purchase the remaining 20 percent by 2020.

The acquisition, which is expected to close in early 2017, will immediately expand Dana's product portfolio with adjacent technologies and establish Dana as the only off-highway solutions provider that can manage the power to both move the equipment and perform its critical work functions. It adds technologies for tracked vehicles, doubling Dana's addressable market for off-highway driveline systems. It also provides a platform of technologies that can be leveraged in Dana's light- and commercial-vehicle end markets, helping to accelerate the company's hybridisation and electrification initiatives.

"We have long admired Brevini's exceptional products, customer focus and company culture, which are some of the most pertinent reasons we specifically targeted this acquisition – at this opportune time in the off-highway business cycle," said James Kamsickas, president and chief executive officer of Dana.

The acquisition of Brevini aligns with Dana's enterprise strategy, which includes leveraging core expertise, strengthening customer centricity, expanding global markets, commercialising new technologies, and accelerating hybridisation and electrification.

Founded in 1960, the privately held Brevini Group employs approximately 2,300 people. It has engineering and manufacturing operations in China, Germany and Italy, with a network of 30 sales subsidiaries and nine service centres around the world. The businesses being acquired reported sales of €388 million in 2015.

"Dana's global footprint, operational excellence, deep industry knowledge, and position as a top-tier supplier to manufacturers will raise the profile and market penetration of our products," said Renato Brevini, president of Brevini Group SpA.

Brevini technologies that will be purchased by Dana include a wide range of highly engineered mobile planetary hub drives; planetary gearboxes; hydraulic pumps, motors, and valves; and advanced electronic control systems. Brevini's expertise in cylindrical gearing and planetary hub gears will supplement Dana's long history and market leadership in spiral bevel and hypoid gear technologies.

"Brevini's product line is a perfect complement to Dana's current offerings, helping us to increase the amount of Dana content on construction, mining, material handling and other off-highway equipment," explained Aziz Aghili, president of Dana Off-Highway Drivetrain Technologies. "Brevini's technology portfolio will increase the number of patents and patents pending for Dana's off-highway business by 33 percent, enabling us to provide our customers with a full range of power-conveyance systems." ■

## Hyundai Construction Equipment appoints new COO



Hyundai Construction Equipment has appointed KY Kong (left) as its new chief operating officer. He is succeeding SG Rhee, who has recently retired.

Mr Kong has been working for Hyundai for 30 years and has held a number of positions within the company, which include head of global forklift sales and head of production. In his new capacity, Mr Kong will continue with maximising operational excellence in both development and production.

"Technology, quality, marketing and HR are the key drivers

for sustainable growth in our business. I am very confident that by focusing on these four pillars we will deliver great value to our customers, grow our market share and achieve our goal of becoming a global top-three construction equipment manufacturer and a top-ten material handling equipment manufacturer," said Mr Kong.

During the past years, Mr Rhee has steered the company through challenging times amid a recessive economy in global markets like Brazil, Russia and China, among others. He has also initiated a comprehensive programme to reduce operating costs and to realign and minimise the number of key suppliers. "Mr KY Kong and I have managed numerous projects together; this makes me believe that this transition should work out smoothly," commented Mr Rhee. ■

## Laurent Bonnaure joins Manitou



Manitou has appointed Laurent Bonnaure (left) as its executive vice president for global sales and marketing, and member of the executive committee. Responsible for the group's worldwide sales and marketing strategy, Mr Bonnaure will be overseeing all of Manitou's distribution subsidiaries as well as the global sales and marketing teams, and will also manage the global dealer network.

He is replacing François-Frédéric Piffard, who will retire in 2017.

Mr Bonnaure has held numerous senior management positions in the US, the UK and France, spending 11 years at the Elis Group before taking on the role of deputy managing director and board member of the Fraikin Group for eight years. There, he also held the

positions of executive vice president international, chief operating officer, and more recently chief executive development officer.

"Manitou is an extraordinary company that is expanding in global markets and territories that are still open to new growth opportunities, thanks to its high-added-value products, the continued innovations in its products and services, and its employees and dealers who are proud of the company and its products," said Mr Bonnaure.

"Continuing to strengthen our global leadership and constantly improving our customers' satisfaction are the main challenges for the coming years," he added. "Building on the remarkable work of François-Frédéric Piffard, I will be concentrating my efforts to accelerate Manitou's development and taking on these new challenges, alongside our teams and our entire network." ■



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## Brokk and Aquajet team up

Brokk, a global manufacturer of remote controlled demolition machines, has acquired Aquajet Systems, a global manufacturer of hydrodemolition machines. "By becoming a part of the Brokk group, we can now accelerate the global growth of Aquajet," said Roger Simonsson, managing director of Aquajet Systems.

Brokk and Aquajet are already well established with customers worldwide. In the construction sector, the products of the two companies complement each other perfectly. While Brokk machines are primarily used for demolishing concrete, Aquajet machines are mainly used for concrete renovation.

Aquajet Systems was founded in 1988. The company is based in Holsbybrunn in south Sweden, where it has its headquarters and production. Brokk is based in Skellefteå, Sweden, and the company has just celebrated its 40th anniversary last year (2016).

"With the acquisition of Aquajet Systems, the Brokk group



Far left:  
Martin Krupicka,  
CEO of Brokk.

Left:  
Roger Simonsson,  
managing director of  
Aquajet Systems.

further strengthens its leading position in providing world-leading machines for the concrete demolition and renovation businesses," said Martin Krupicka, CEO of Brokk.

According to Brokk, there are no organisational changes following the acquisition and the management of both companies will remain the same. ■

## Kobelco restructures

Following its merger with Kobelco Cranes in April 2016, Kobelco Construction Machinery (KCM) is now going to restructure and consolidate its group companies in Japan and overseas. The process will be carried out in stages.

As a first step, KCM will consolidate and establish several new subsidiaries overseas. In the Middle East and Africa, the company has established a subsidiary in Dubai, UAE, named Kobelco Construction Machinery Middle East & Africa FZCO. It is responsible for sales and service operation of hydraulic excavators in the Middle East and Africa, as well as sales and service operations of crawler cranes in the Middle East.

Originally, KCM's excavator and crane businesses had been handled by an overseas representative office in Bahrain and Kobelco Cranes Middle East FZE (a subsidiary in Sharjah, next to Dubai, UAE), respectively. With the consolidation of the local business

operations, Kobelco Cranes Middle East FZE will be liquidated, said KCM.

In addition, to streamline the business in the Americas, KCM will combine its two subsidiaries currently operating in the US. After the consolidation, the company will not only manufacture and sell hydraulic excavators and oversee excavator dealers, but also sell crawler cranes and oversee crane dealers in the Americas.

Originally, KCM's excavator and crane businesses had been managed by Kobelco Construction Machinery USA (KCMU) headquartered in Katy, Texas and Kobelco Cranes North America located in Houston, Texas, respectively. However, in order to improve the business efficiency of these subsidiaries and optimise their operations, KCM will merge Kobelco Cranes North America into KCMU to develop and improve sales, the dealer network and after-sales service network in the Americas. ■

## Mecalac to acquire Terex's construction business in England

French manufacturer Groupe Mecalac SA has signed an agreement with Terex Corporation to acquire its subsidiary in Coventry, England, the UK, which manufactures backhoe loaders, site dumpers and compaction rollers - these machines are also known under the Fermecc and Benford brands. The acquisition is expected to be completed in the first quarter of 2017.

Groupe Mecalac specialises in the design, manufacture and distribution of construction equipment, especially for urban construction sites. The acquisition will allow the company to broaden its offerings with a complementary range of products, open up to new geographical distribution areas and expand its industrial know-how.

"This acquisition follows our growth strategy, based on excellence, on the broadening of our range of equipment for urban construction sites, and on international distribution deployment. Our intent is to foster the sharing of expertise, the development of industrial and sales synergies, and to encourage cultural exchanges along with sharing our fundamental values among the teams," said Henri Marchetta, CEO of Groupe Mecalac. ■

## US construction equipment exports down 25 percent

Exports of US-made construction equipment fell 25 percent overall for the first three quarters of 2016 compared to the same period in 2015, for a total US\$8.2 billion shipped to global markets, according to the Association of Equipment Manufacturers (AEM), citing US Department of Commerce data it uses in global market reports for members. All world regions were in decline from single-digit drops for Europe and Central America to decreases in the 50-percent range for Africa and South America.

The top countries buying the most US-made construction machinery during the first three quarters of 2016 (by dollar volume) were, in order: Canada - US\$3.5 billion, down 21 percent; Mexico - US\$831 million, down 9 percent; Australia - US\$392 million, down 33 percent; Belgium - US\$294 million, up 33 percent; Germany - US\$202 million, up 24 percent; China - US\$190 million, down 8 percent; Peru - US\$181 million, down 30 percent; Chile - US\$165 million, down 60 percent; Japan - US\$147 million, up 6 percent; and Brazil - US\$145 million, down 61 percent. ■

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12 to 14 Apr 2017	Ecobuild Southeast Asia 2017 Kuala Lumpur Convention Centre Kuala Lumpur Malaysia	United Business Media (M) Sdn Bhd Tel: +603 2176 8788, Fax: +603 2164 8786 Email: ecobuild-sea@ubm.com Website: www.ecobuildsea.com
18 to 20 May 2017	BuildTech Yangon 2017 Thuwunna Stadium Yangon Myanmar	Sphere Exhibits Pte Ltd Tel: +65 6319 4037, Fax: +65 6319 6140 Email: btyangon@sph.com.sg Website: www.btyangon.com
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31 Oct to 3 Nov 2017	APEX Asia 2017 Shanghai New International Expo Centre Shanghai China	KHL Group Tel: +44 1505 850 043 Email: murray.pollok@khl.com Website: www.apexasia.show.com
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7 to 11 Mar 2017	Conexpo-Con/Agg 2017 Las Vegas Convention Centre Las Vegas, Nevada USA	Association of Equipment Manufacturers Tel: +1 414 298 4167, Fax: +1 414 272 2672 Email: international@conexpoconagg.com Website: www.conexpoconagg.com
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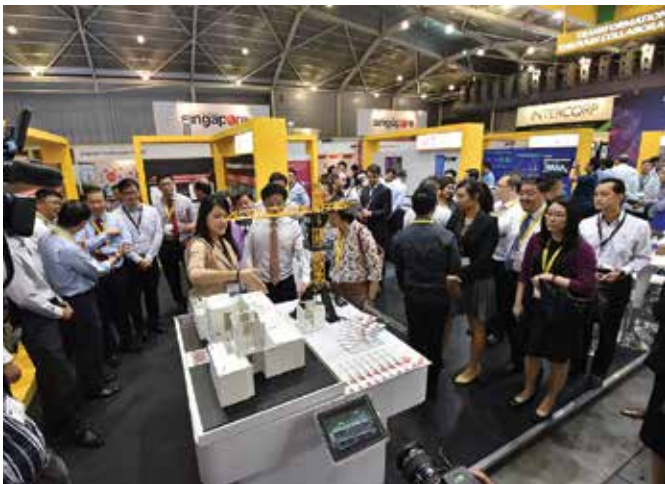
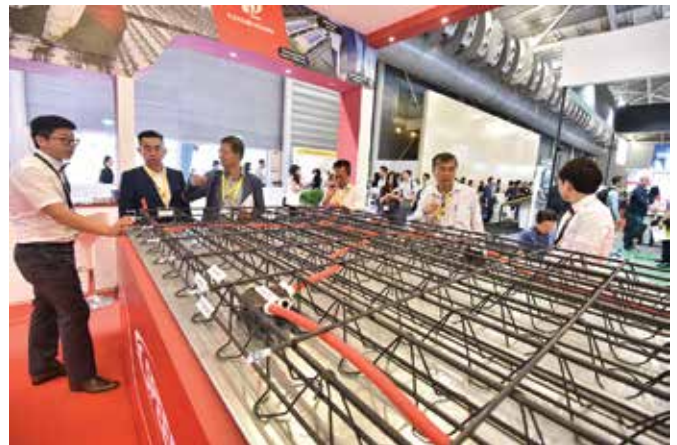
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# Singapore reinforces productivity with new technologies

The sixth edition of BuildTech Asia, organised by Sphere Exhibits and hosted by the Building and Construction Authority (BCA), was held from 18 to 20 October 2016 in conjunction with the Singapore Construction Productivity Week (SCPW). The show attracted approximately 7,000 visitors from 32 countries, featuring the latest technologies in construction machinery, building materials and architectural solutions. Robotics and Internet of Things (IoT) technology were also on display alongside 3D concrete printers, immersive Big Data and Virtual Reality applications.

BCA identified 35 key technologies under seven R&D clusters to enable the built environment sector sustain productivity improvements in the long term. These areas include Design for Manufacturing and Assembly (DfMA), automated equipment and robotics, infocomm technology, Building Information Modelling (BIM) and Virtual Design and Construction (VDC), 3D printing, advanced construction materials and productive solutions for civil engineering works.

In addition, BCA's announcement to fund S\$2 million for four research projects will focus on solutions that drive DfMA in the sector with much on-site construction works shifted to off-site prefabrication and automation in a factory environment as well as improving integration across the construction value chain.



All images: BuildTech Asia 2016 was held in conjunction with the Singapore Construction Productivity Week.

About 100 trade delegates were also present at site visits to the BCA Skylab - a rotatable test facility pivotal to developing innovative energy efficient building technologies - and a construction site for a residential estate comprising nine blocks of 22 storey buildings. This residential site is said to be the first in Singapore to implement the use of productive technologies such as Prefabricated Volumetric Construction (PVC) modules for three blocks, conventional 2D precast panels for the remaining six blocks and the use of Prefabricated Bathroom Units (PBUs) for all units. The project is based on first generation (Concrete PVC) proposal using columns, beams and slabs.

Other programmes at the BuildTechAsia included the inaugural Building Internet of Things Asia (B-IoT Asia) Conference, the Environment Sustainability Conference, and the first Productivity and Innovation Awards (PIA) 2016 organised by the Singapore Construction Association Limited (SCAL).

The SCAL PIA 2016 is an industry-led initiative designed to raise productivity in the construction sector through a ground-up approach for innovative ideas, which aims to generate significant improvements at the workplace. The winners were: Lian Soon Construction Pte Ltd (Gold), for its durable reusable ECM drain (iDrain); Samwoh Corporation Pte Ltd (Silver), for its productive and green solution for pavement retexturing & spillage removal; and S C Ang Consortium Pte Ltd (Bronze), for its GNSS for piling project.

The next BuildTech Asia is planned to return to the Singapore Expo in October 2017. ■

Website: [www.buildtechasia.com](http://www.buildtechasia.com)

## Concrete industry players gather in Indonesia

Concrete Show South East Asia took place for the fourth time in Jakarta, Indonesia, from 14 to 16 September 2016. Organised by PT UBM Pameran Niaga Indonesia, the show serves as a platform for major industry players to expand their network and develop their business both in Indonesia and across Southeast Asia, as well as to offer solutions that support the local government's initiative to improve and accelerate national infrastructure developments in all regions of Indonesia.

Concrete Show South East Asia features a wide range of products, services and technologies such as precast and prestressed concrete, concrete mixers, batching plants, lightweight brick machinery and steel reinforced concrete technologies. The show was attended by more than 200 companies from 28 countries including Indonesia, Germany, Italy, Spain, Belgium, Turkey, Japan, Singapore, Malaysia, Russia and China. Among Indonesian exhibitors were Semen Indonesia, Waskita Beton Precast, Adhi Persada Beton and Royal Chemie Indonesia.

There were also conferences and seminars with various speakers, including Davy Sukamta, head of Indonesia Construction Export Association (Himpunan Ahli Konstruksi Indonesia); Prof Ir Bambang Budiono from Bandung Technological Institute (ITB); Hari Nugraha



All images: Concrete Show South East Asia serves as a platform for major industry players to expand their business in Indonesia and across the region.

Nurjaman, general secretary of Indonesia Precast and Prestressed Expert Association (Ikatan Ahli Pracetak dan Prategang Indonesia), and Lim Chong Sit from Singapore.

Christopher Eve, president director of PT UBM Pameran Niaga Indonesia, commented, "Technological improvements must be continued progressively in order to accelerate both infrastructure developments and national economy growth. Concrete Show South East Asia is hoped to become a platform to improve the quality and capability of the construction sector where all primary industry players come and interact. National industry players can also use this opportunity to update information, find a solution and adapt to new technologies that can increase the efficiency and quality of concrete products in Indonesia. Therefore, we hope that Indonesia will not only be able to compete in the ASEAN markets, but also capable of producing quality projects in terms of national developments."

Indonesia is the largest economy in the Southeast Asia region and its construction sector is expected to grow significantly in 2017, with many public and private projects. Due to this, the use of concrete and other construction materials is also expected to increase, as they will be needed for these developments. According to the show organiser, the size of the construction market in Indonesia was the biggest consideration when selecting the country as a host for Concrete Show South East Asia. ■

Website: [www.concreteshowseasia.com](http://www.concreteshowseasia.com)

# IPAF's new representatives for India and Nordic region

Jason Woods, IPAF Middle East representative, will take on additional responsibility as IPAF's representative for India. This new role builds on his extensive experience in the access industry and recent success in growing IPAF's presence in the Middle East. IPAF currently has members across Jordan, Kuwait, Oman, Qatar, Saudi Arabia and the UAE. The Federation has also established good relations with several health and safety authorities in the region, with the aim of promoting the safe use of powered access equipment in different industries.

"Adding India to IPAF's Middle East representation was a logical development, due to the strong trade links between the regions, with many India-based companies operating in the Gulf area," said IPAF CEO Tim Whiteman. There are currently close to 15 IPAF members in India. Mr Woods is based in the UAE.

Nitin Gokhale from Dynamic Crane Engineers, who chairs the IPAF India Country Council, said, "IPAF members in India welcome Jason's new appointment

and additional support. This will help us further promote the safe and effective use of powered access in emerging markets where technical expertise, guidance, training and safety initiatives will be of great benefit."

In addition, Kent Boström has been appointed to the position of IPAF Nordic representative. "The Nordic region is seeing fast-growing demand for IPAF's services," said Mr Whiteman. "I am delighted that Kent is coming on board to help us further promote the safe and effective use of powered access here. His experience in international marketing and communications, and in-depth knowledge of the industrial and construction sectors make him well-suited to this exciting role."

Reporting to Romina Vanzi, IPAF head of regional development and MCWPs, Mr Boström brings a wealth of marketing and communications experience from his work with manufacturers in Sweden. This includes a decade developing the marketing and communication strategy for dewatering pump manufacturer Grindex from 2000 to 2010.



Jason Wood.



Kent Boström.

More recently, Mr Boström draws on his experience as a communications manager at water-powered drilling specialist LKAB Wassara, through his own company, KB Communications, and as communications manager for ITT Water & Wastewater.

IPAF representatives are responsible for liaising with government and industry organisations, recruiting new IPAF members and training centres, and promoting IPAF's safety initiatives and training programmes. ■

## IPAF invests in technical depth

IPAF has appointed two technical officers to add depth and innovation to its technical and safety department. One of them is Harald Fries, who will be based in IPAF's Swiss office in Basel. He is an electrical engineer with a background in safety processes and nuclear energy. Mr Fries has held several safety director positions in the nuclear industry, and has some experience of operating mobile elevating work platforms (MEWPs).

The other new officer is Rupert Douglas-Jones, who will be based in IPAF's head office in the UK. He is a seasoned MEWP instructor, having been in the access industry for over 20 years in differing management roles. Mr Douglas-Jones also has experience as an expert witness.

Both technical officers will report to IPAF's technical & safety executive Chris Wraith. "Between us, we now have an increased range of experience and knowledge in the technical and safety department, thus enabling us to offer greater support to our members, undertake



IPAF's technical and safety team now comprises (from left) Harald Fries, Chris Wraith and Rupert Douglas-Jones.

specific research projects, and influence European and international developments in the market," said Mr Wraith. ■

## International Awards for Powered Access 2017 to be held in London

The International Awards for Powered Access (IAPAs) 2017 will be held on 4 April 2017, in London, the UK. Organised by IPAF and Access International magazine, the event will take place on the same day as the IPAF Summit at the Hilton London in Wembley.

The award categories include: The IAPA Innovative Technology Prize; Contribution to Safe Working at Height; Access Rental Company of the Year; Powered Access Pioneer; Product of the Year – Self-propelled below 20 ft / 6.1 m (booms, scissors, atrium lifts, vertical

masts); Product of the Year – Self-propelled above 20 ft / 6.1 m (booms, scissors, atrium lifts, vertical masts); Product of the Year – Mast climbing work platforms/hoists; Product of the Year – Vehicle, trailer-mounted; Project of the Year; IPAF/Access International Lifetime Achievement Award; and Access Photograph of the Year.

The awards are free to enter, and companies and individuals can enter themselves or nominate others. ■

Website: [www.iapa-summit.info](http://www.iapa-summit.info)

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## New Watermaster Classic V dredger

The new Watermaster Classic V dredger from Aquamec has 50 percent more suction dredging capacity compared to the previous model, the Classic IV. Featuring a larger Watermaster Cutter Pump, along with a more powerful engine and other new features, the Classic V offers a pumping output of up to 900 cu m/hr.

A big part of the work Watermaster does is located in urban areas and done for environmental reasons, including flood prevention and removal of polluted sediments. With a wide selection of heavy-duty attachments, this versatile machine can perform various tasks like dredging, excavating, raking, piling and hammering.

The new Classic V can also work and move in the whole shallow water area from dry ground to 6 m depth, said Aquamec. The machine's cutting knife system for debris enables it to pump soils containing a significant amount of plastics and other urban trash and thus dredge in areas where only excavation work was previously possible.

Other new features increase the pace of the urban dredging process. The new hard soil cutter crown together with the bigger, more powerful hydraulic motor take Watermaster Classic V to a new capacity level in hard soil dredging.

The amphibious multipurpose Watermaster dredgers have been used worldwide in many applications, such as flood prevention, deepening shallow waterways, cleaning urban canals, building infrastructure in water environment and industrial-pond maintenance work. According to Aquamec, the size of the machine has stayed the same (20 t) since the first generation model - Classic I - but the capacity has nearly tripled.

Based in Finland, Aquamec Ltd develops, manufactures and markets Watermaster dredgers. The Watermaster Classic I was launched in 1986, followed by Classic II in 1996 and Classic III in 2003. Watermaster Classic IV was launched in 2011 and the 2017 version of the same model is manufactured alongside Classic V. ■

Website: [www.watermaster.fi](http://www.watermaster.fi)

All images: Aquamec's new Watermaster Classic V dredger has 50 percent more suction dredging capacity compared to the previous model. With a wide selection of heavy-duty attachments, the machine can carry out various tasks such as dredging, excavating, raking, piling and hammering.



## Kolberg-Pioneer expands jaw crusher product line

Kolberg-Pioneer has expanded its jaw crusher product line with the new 3365 Pioneer jaw crusher. The innovative shaft and bearing assembly increases serviceability and reduces maintenance and rebuild cost, providing a lower total cost of ownership through the lifetime of the machine. The electric motor mount, v-belt drive and guarding are all integrated on the machine, providing an easy-to-install compact package for mobile or stationary applications.

According to Kolberg-Pioneer, the crusher has up to 20 percent more capacity than the next size in its width class in both hard rock and recycled applications. The 3365 also features an automatic adjust, for both the wedge style and tramp iron release systems. Other advantages include replaceable jaw die seats, barrel protector plate and an aggressive 1.5-in stroke. ■

Website: [www.kpji.com](http://www.kpji.com)



Right: The new 3365 Pioneer jaw crusher.

## LINNHOF ASPHALT MIXING PLANT



Photo: Mobile Asphalt Plant TSD1500 (90-100 TPH)

Linnhoff Technologies is a manufacturer of asphalt mixing plants from Germany since 1900s. Linnhoff product range includes various capacities of mobile, portable, and stationary asphalt mixing plants, as well as ancillary equipment.

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# Wirtgen's new W 215 milling machine for Asian market

Wirtgen's new W 215 cold milling machine is targeted at the Asian market. The chassis is significantly narrower, giving the driver an improved view of the milled edge. Level Pro Plus, a new levelling system developed by Wirtgen, has been completely integrated into the machine's control system to ensure a precise, high-quality milled result thanks to its simple intuitive operation. The preset target milling depth is accurately controlled via robust displacement sensors located in the hydraulic cylinders, which are mounted on the side plates. It is indicated on the high-resolution Level Pro Plus colour display. The plug-and-play interface allows additional sensors to be connected easily to the levelling system at any time.

The W 215 provides an extra 25 percent of milling output, according to Wirtgen. Equipped with a 470 kW diesel engine, this large milling machine delivers enormous engine power yet still consumes less fuel per cubic meter of milled asphalt, said the company. Three variably selectable milling drum speeds individually ensure the maximum milling output across a wide range of applications. The high-precision steering system on the front and rear crawler tracks also make for great manoeuvrability on the job site.

The milling drum assembly is bursting with technology. 'Delta 18', for instance, the new milling drum technology, guarantees a high milling output while reducing cutter costs. The right-hand side plate can be raised by 450 mm, and the left-hand side plate by 330 mm, making it easy to mill flush to edges even at great working depths, explained Wirtgen.

With the Flexible Cutter System Light (FCS Light), Wirtgen offers an optimum solution: milling drums with various tool spacings can be replaced in a short space of time. That makes it possible to perform a range of milling operations with one and the same machine. As a result, the W 215 is versatile, able to cover everything from standard applications through fine milling for the creation of new, level road surfaces (ideally with the Multiplex levelling system) to the use of what are known as ECO cutters for a particularly high area performance – up more than 20 percent on standard milling drums – at low cost.

Incorporating additional ingenious solutions in milling and loading, the W 215 can carry out its job efficiently while attaining a high level of performance. Combined with a



Above: The new Wirtgen W 215 cold milling machine is suitable for the Asian market, equipped with the company's Level Pro Plus levelling system.

Left: The complete integration of the Level Pro Plus levelling system into the machine's control system leads to a high degree of automation while greatly improving levelling quality. Mechanical surface scanning, cross slope sensor, sonic sensors and the Multiplex system allow a wide range of milling operations to be performed precisely.



Thanks to the 850-mm-wide loading conveyor and a slewing angle of 60° to the left and right, the W 215 can load milling material quickly and efficiently.

faster conveyor speed, the extra-wide loading conveyor achieves an excellent output, allowing for continuous RAP loading. The conveyor's wide slewing angle of 60° to both

the left and right also makes it possible to transfer material even on difficult job sites, such as at traffic circles or intersections. ■

Website: [www.wirtgen.com](http://www.wirtgen.com)

# Elcometer 500

The new Elcometer 500 coating thickness gauge is designed to accurately measure the thickness of dry film on concrete and other cementitious substrates up to 10 mm thick. It allows 60+ readings per minute in standard mode and over 140 readings per minute in scan mode.

Due to its ergonomic design, the Elcometer 500 is suitable for continuous use. It is also easy to use – users can select the coating material and start measuring; no need to set up gates, range values or know the thickness of the coating. To prevent false or incorrect readings, the gauge only displays a reading when the signal strength indicator goes green.

The Elcometer 500 has a 100,000 reading memory with data transfer via Bluetooth or USB to ElcoMaster for PC or mobile devices for instant report generation. The gauges and probes are ideal for harsh environments, featuring dust and waterproof design equivalent to IP54, with field replaceable probe wear tips. The Elcometer 500 can be used in accordance with ASTM 06132, SSPC PA9 and ISO 2808. ■

Website: [www.elcometer.com](http://www.elcometer.com)



Signal strength indicator prevents incorrect readings.



Transfer data to PC or mobile devices via Bluetooth or USB.

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## Rammer attachments and demolition tools

The new Rammer cutter crusher (RCC) range is manufactured from wear resistant HB400 steel for a longer life. Suitable for carriers in the 3 to 130 t operating weight range, the RCC models (except the 290 kg RCC04R) feature a chamfered jaw design for greater penetration, a speed valve and desynchronised jaws for more precise placement and faster cycle times.

All models (other than the RCC04R) feature full hydraulic rotation for faster and more precise positioning. This system is covered by hydraulic rotation valve protection for longer motor life and reduced owning and operating costs. As a further nod towards system protection, the larger RCC models all feature forged and fully protected cylinder rods, heat-treated pins as well as bushes for a longer low maintenance life.

The smaller RCC04R may lack the powered rotation of its larger brothers, but it also benefits from a number of technological advances. A pressure intensifier system, which is installed on both cylinders, allows the jaws to deliver optimum performance with the external hydraulic system operating at normal pressure. Not only does this enhance performance, delivering the crushing power of larger and heavier competitive models, it also helps protect the operator and maintenance personnel from exposure to high-pressure systems.

Integrated oil filters help protect the boosters from impurities in the hydraulic oil, while a regeneration and cleaning oil distributor maintains pressure at the required level, avoiding pressure peaks as well as reducing maintenance costs.

The Rammer scrap shear (RSS) line-up is designed to withstand harsh demolition environments. With nine models that are suitable for carriers in the 2 to 60 t operating



Far left: RCC30R cutter crusher.

Left: RPV29R pulveriser.

Below, left: RSS45R scrap shear.

weight range, these scrap shears are also manufactured from HB400 steel for optimum wear resistance and a long working life. They also share the same hydraulic rotation, rotation protection, heat-treated pins and bushes, and weld-free cylinder rods found on the Rammer cutter crusher range.

All the new models feature a speed valve for improved cycle times and a smart jaw design that allows material to fall away from the cutting area, enhancing performance and increasing uptime. A double guide helps ensure excellent cutting jaw alignment for better cutting delivering lower owning and operating costs.

A central pin adjustment system also helps prevent jaw deviation to maintain maximum cutting performance. This system can also reduce operating costs by minimising the amount of material struck between the jaws. To further minimise owning and operating costs, each unit features cutting blades that have four usable sides that can be reversed.

In addition, Rammer's new RPV series of rotating pulverizers consists of four models that are suitable for carriers in the 10 to 45 t operating weight class. This series is also manufactured from HB400 steel, featuring heat-treated pins and bushes for a long service life.

A full hydraulic rotation, which is protected by a rotation protection system, facilitates more precise alignment for faster cycle times and greater productivity. A speed valve system reduces cycle times for greater productivity, and helps reduce stress on the hydraulic components, extending their life and reducing owning costs. The RPV jaws are designed to allow crushed material to escape from the crushing area, reducing clogging, minimising maintenance and increasing productivity. Cutting blades and wear parts can be changed 'in the field' without special tooling to return the Pulveriser to factory specifications.

The RPV range of static pulverizers, which has six models with operating weights from 150 to 4,200 kg, are suitable for carriers in the 1.5 to 45 t operating weight class. They share all the features of the RPV series, aside from the hydraulic rotation. ■

Website: [www.rammer.com](http://www.rammer.com)

## Hyundai offers de-tiering kits

Hyundai Construction Equipment offers de-tiering kits to adjust machines to those markets with a less stringent emission regulation and high-sulfur fuel.

The company recently launched its Stage IV excavator and wheel loader line-up, which comply with the latest emission regulation. These new HX excavators and HL wheel loaders are succeeding the previous Stage IIIB Hyundai 9A-series. Now, with the availability of 'de-tiering kits' or 'sulfur tolerance kits', Hyundai dealers can de-tier their 9A-series machines before delivering them to countries with less stringent emission regulation. De-tiering means automatically emission decertification. ■



# Ammann HRT plant designed for greater productivity

The Ammann ABP 320 HRT plant is ideal for asphalt manufacturers who need to incorporate large proportions of recycled asphalt (RAP) without sacrificing production capacity and quality. This ‘2-in-1’ plant features both a warm and cold recycling system that can be used simultaneously.

There are two warm recycling systems to choose from. One is the conventional concurrent flow dryer for RAP additions of up to 60 percent. The second is Ammann’s latest development in warm recycling, the RAH100, from which 100 percent recycled materials can be utilised. The plants also can be equipped with optional RAP feed bins, which enable the separation of different RAP grain sizes to the drum or mixer, depending on the recipe.

The Ammann ABP 320 HRT has a production capacity of 320 t/hr. It can utilise foamed bitumen, pigments and other additives. The plant is equipped with the as1 control system, which is user-



Ammann ABP 320 HRT plant features both a warm and cold recycling system that can be used simultaneously.

friendly and includes valuable tools such as energy consumption monitoring and a fully automated load-out module.

The Ammann ABP 320 HRT is designed to produce hot mixes, low-temperature asphalt and optionally cold asphalt. The standard design features a real-time energy consumption display, a fume suction system

throughout the plant and full cladding. According to Ammann, the most notable difference between the HRT and traditional plants is the vertical stacking of the RAP-bearing components; this configuration reduces wear and sticking and shortens the travel distance of hot RAP material. ■

Website: [www.ammann-group.com](http://www.ammann-group.com)

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# Formwork solution for Malaysia's new office tower

A new administration building is currently under construction in the government district of Putrajaya for the Malaysian Anti-Corruption Commission (Suruhanjaya Pencegahan Rasuah Malaysia or SPRM). The first 30 floors of the three building complexes are elevated on delicate inclined supports. A massive intermediate level seems to hover at a height of 40 m. In addition to the special architecture, the ambitious construction schedule provided a special challenge.

For the project, Peri planned and delivered the overall concept of the wall, slab and climbing formwork through to the appropriate formlining for the required concrete surfaces. A particularly important role in the project specific planning services was played by the spatial working scaffold and shoring solution, which was based on the Peri Up modular scaffold system. The construction team could carry out the stable structure base efficiently, safely and in a correspondingly short time right from the beginning.

For working at heights, Peri planned the project-specific optimal combination of different climbing systems. With the help of RCS climbing formwork units, CB working platforms and BR shaft platforms, the vertical reinforced concrete components and circular

inclined supports were efficiently and safely constructed. For the most part, the Vario GT 24 girder wall formwork was combined with the respective climbing system. Following the fast working speed of the climbing technology, Peri Up was assembled as a birdcage scaffold with a basic grid of 1.50 m x 1.50 m. The scaffolding provided safe working and access areas at all levels.

In addition, corresponding intermediate supports could be done with the construction for the required horizontal bracing of the inclined reinforced concrete columns. The solution for this temporary stabilisation of up to 30 m high inclined columns was developed by Peri in close cooperation with Arup; for this, ST 100 stacking towers were used as well as specially developed connection components.

The dimensioning of the Peri Up birdcage scaffold was especially coordinated to accommodate the subsequent load-bearing function in order to concrete the up to 1.80 m thick intermediate slabs at heights of over 40 m. Due to the 25 cm system grid, the scaffolding could be flexibly adapted to suit the building's geometry. As a result, different set-up levels, circular columns at inclined spatial angles as well as increased load concentrations could be taken into consideration. In the birdcage scaffold, integrated Peri Up aluminium flights of stairs also provided safe access to all areas. ■

Website: [www.peri.com](http://www.peri.com)



Three elevated high-rise structures for the new SPRM administrative centre. Peri supported the construction progress with an efficient climbing solution, complex shoring construction along with a comprehensive range of services.



Above: On the basis of the RCS rail climbing system, the inclined circular columns could be efficiently constructed.



Working scaffold, bracing and shoring all rolled into one: Peri Up subsequently followed as birdcage scaffold within the cycle of the RCS climbing formwork.



Left: The floor slabs above the 1.80 m thick intermediate slab were built cost-effectively with PD 8 shoring towers and large-sized slab tables.

# Haulotte plays role in Singapore major projects

Haulotte aerial platforms have been involved in a number of major projects in Singapore. One of them is the construction of Changi Airport Terminal 5 (T5) located at Changi East. The project is expected to be completed in 2020, after which it will be able to handle about 50 million passengers a year.

Several Haulotte Optimum 8 AC scissor lifts are being used on the T5 project site. The machines, rented out by Aly Energy, are helping the construction crew to carry out various ceiling works including the ventilation system at a new three-storey building, a part of landside facilities of the airport.

In addition, Haulotte's Optimum 8 AC scissor lift and HA18SPX articulated boom have been used at the construction of Duo Residences, located at 1 Fraser Street in the Bugis area. The project is scheduled for completion in 2017.

Developed by M+S Pte Ltd, the Duo Residences is a mixed development of a hotel, 49-storey residential tower and 39-storey commercial tower. Both Haulotte machines, leased out by Nishio Rent All Singapore Pte Ltd, were used to assist the facade works, cladding roof panels for sheltered walkway and installing wall panels. ■

Website: [www.haulotte.sg](http://www.haulotte.sg)



Above: Several Haulotte Optimum 8 scissor lifts are currently working on the Changi Airport Terminal 5 project.



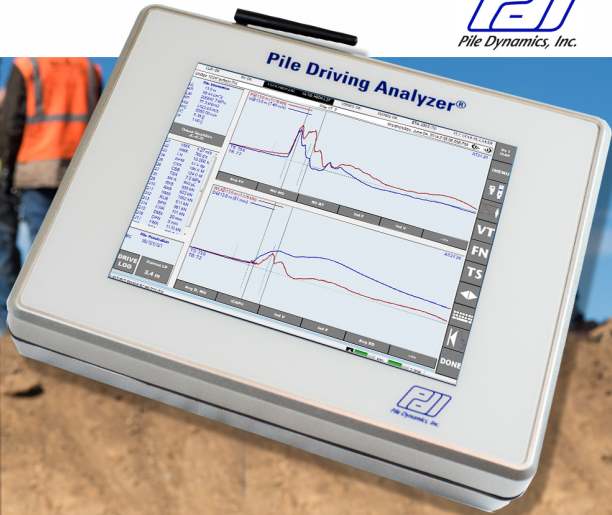
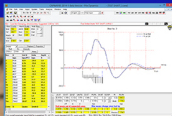
Left and far left: Haulotte Optimum 8 scissor lift (left) and HA18SPX articulated boom have been used at the construction of Duo Residences in the Bugis area.



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# Mapei systems chosen for SAMUR project in Malaysia

Construction of Petronas Chemicals Group Bhd's Ammonia Urea Complex – also known as the SAMUR Project - in Sipitang, Sabah, Malaysia, started in mid-2012. The facility is located at the Sipitang Oil & Gas Industrial Park, comprising an ammonia plant, a urea plant, a granulation plant, integrated utility units and jetty facilities.

This RM5 billion BEPC (Basic and Detailed Engineering, Procurement, Construction and Commissioning) contract was awarded to a consortium comprising Mitsubishi Heavy Industries, Apex Energy Sdn Bhd and PT Rekayasa Industri. The project was completed in November 2015.

Mapei systems were used to provide a highly chemical-resistant and abrasion-resistant lining for the cooling tower in the ammonia processing plant, as well as for waterproofing the roof slab.

Mapei's Primer SN, Mapecoat VE 825 AP and Mapetex GRP225 were all used for the lining of the cooling tower, covering an area of 2,500 sq m. The Mapetex GRP225 was applied to reinforce the Mapecoat VE 825 AP. Mapei's Plastimul MY and Mapethene TA were chosen for waterproofing the roof slab, covering an area of 1,500 sq m. ■

Website: [www.mapei.com.my](http://www.mapei.com.my)

Below: Mapei's waterproofing system, Mapethene TA, being installed on the roof slab.



Above: View of the SAMUR project in Sabah, Malaysia.



Left: The ammonia processing plant that houses the cooling tower.

Below: Mapei's Mapecoat VE 825 AP system was used for the lining of the cooling tower.



The article courtesy of Realta Mapei International no. 57

# XCMG drill jumbo goes to Mongolia-China railway project

An XCMG hydraulic rock drill jumbo has been working at the construction of Mongolia-China railway. The machine is being used by Shanghai Civil Engineering Co Ltd of CREC in the 14.533-km-long Da Zhongshan tunnel, which is a main part of the MHTJ-16 bid-section of the project.

The MHTJ-16 bid-section features a total length of 44.86 km. It comprises 14 tunnels with an overall length of 33.38 km, accounting

for 74 percent of the whole railway. The XCMG TZ3A three-boom hydraulic rock drill jumbo was put into operation in September 2016.

The machine was first launched in 2012, and since then it has been involved in many other national projects such as a water supply project in the northwest of Liaoning Province, Shenzhen-Maoming high-speed railway and Mianzhu-Maoxian highway, among others. ■

Website: [www.xcmg.com](http://www.xcmg.com)



Far left and left: The XCMG TZ3A hydraulic rock drill jumbo plays role in the Mongolia-China railway project.

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# Genie helps build rail lines in Vietnam and Singapore

Singapore's Mass Rapid Transit (MRT) system is being expanded. One of the projects is the Tuas West Extension, which will extend the East West Line with the addition of four more stations. This extension features a 7.5 km twin-tracked MRT viaduct. The construction work started in May 2012 and is expected to be completed by early 2017.

Aver Asia (S) Pte Ltd rented out 120 Genie machines for the project, which included Genie Z-80/60, GS-5390 RT, S-105, GS-1930, Z-34/22 N and GS-2646. These machines came into the project at the M&E stage to carry out electrical and fire protection installations. They were mainly used to elevate workers to hard-to-reach areas of the MRT viaducts.

The Genie Z-80/60 is an engine-powered articulating Z boom that provides lifting versatility with a combination of up, out and over positioning capabilities and outreach that is second to none. It comes with Genie Fast Mast system that lowers the platform to the ground without having to lower the secondary boom. It can raise primary and secondary booms simultaneously.

The Genie GS-5390 RT rough terrain scissor lift is a tough, construction-oriented four-wheel drive machine with positive traction control. It is ideal for increasing productivity in demanding outdoor worksites and rigorous jobsite conditions.

The Genie S-105 is a telescopic S-boom with an excellent horizontal outreach. It is perfect for areas with limited access in construction and industrial applications. This machine is a Super Boom model that combines maximum reach with great manoeuvrability.

The Genie Z-34/22 N boom is an electric and bi-energy machine that offers quiet, emission-free operation to be used in highly sensitive work environments. It is suitable for confined work spaces at only 1.47 m wide with zero tailswing.

The Genie GS-1930 scissor can manoeuvre in tight spaces. Its slab scissor lift is excellent for indoor and outdoor construction, maintenance and installation applications with firm, level surfaces. The machine works on a zero-emission electric operation.

The Genie GS-2646 scissor can also manoeuvre in tight spaces and has similar features to the GS-1930. The machine comes with a zero-emission electric operation.

In addition, Vietnam plans to build nine MRT lines in Ho Chi Minh City (HCMC). The



All images: Genie machines being used in the construction of MRT lines in Singapore (above) and Ho Chi Minh City, Vietnam (above left and left).

construction of the first two lines is already underway. Line 1 will run from Ben Thanh Market, the commercial hub, to Suoi Tien in a northeasterly direction. A total of 2.2 km of the 19.6 km line will be underground. The 18.3 km Line 2 will run underground from Thu Thiem via Ben Thanh Market and Tan Binh district to Nga Tu An Suong.

HCMC's master plan involves developing three monorail lines with a total length of 37 km and six underground metro routes with a total length of 107 km. The Asian Development Bank (ADB) projected the cost of building this infrastructure to be US\$104.3 million.

The construction of Metro Line 1 is being handled by Freyssinet-VSL-Rizzani de Eccher Joint Venture (FVR JV), a customer of Genie dealer, Tuyet Nga Co Ltd. The joint venture specialises in the construction of girder segments and structures. The job on the project includes casting and assembling

4,563 U-shaped girder segments across a distance of 12 km in District 9 of HCMC.

This job involved working in high positions using a lot of materials and equipment of different shapes, sizes and weights. FVR found Genie telescopic forklift and telescopic booms to be most suited to lift up construction materials, metal parts and equipment. Four units of GTHTM-1056 forklift (two sales and two rental), two units of S-80 boom lift and two units of S-60X boom lift were used on the project.

The telescopic forklift has a maximum lift height of 17.32 m and a maximum forward reach of 12.8 m to move heavy loads over obstacles. It also has a compact outside turning radius, with an excellent ground clearance and horizontal outreach. S-booms are also designed for productivity with the traction and drive speed needed to get around the job site and to the work area. ■

Website: [www.genielift.com](http://www.genielift.com)

## Moore Construction and Auger Torque team up in NZ

More than five years after the deadly earthquake in February 2011, the city of Christchurch in New Zealand continues to rebuild, with much of the work now focusing on its central business district (CBD) and suburbs. One of the local companies involved in this rebuilding effort is Moore Construction, a family owned business that operates in and around Christchurch. Having been in the earthmoving industry for over 25 years, the company predominantly works in the Christchurch area, but also operates a smaller base in the West Coast region. Its main workload usually revolves around civil and concrete works as well as regular earthmoving jobs; however, as the demand of screw pile installation has increased in the years after the earthquake, this kind of work has now become a large part of the company's day-to-day agenda.

In addition, Moore Construction has carried out a major screw piling work in the north of New Zealand. On this project, the company deployed its Hitachi excavators to put down over 3,500 m of screw piles to help lift a prison which had sunk. The Hitachi excavators worked together with some of Auger Torque's latest screw pile torque heads, enabling the job to be completed on time and on budget.

The new Auger Torque XHT250, delivering up to 250,000 Nm of torque, and a smaller unit, the Earth Drill 50,000 MAX, created an extremely versatile and capable combination. According to Moore Construction, the two units worked well in conjunction with the smaller unit starting the pile and punching through the softer layers quickly, and the larger unit would then take over where high levels of torque were required, ultimately reaching up to 35 m in depth.

On another project just outside of Christchurch, Moore Construction has been tasked with the installation of the foundation for a new community hall. The site used to be part of a big housing estate before it was demolished after the 2011 earthquake. Equipped with the Auger Torque XHT250, Moore Construction was able to install the timber piles in the dense sand layers easily.



Above and below: Moore Construction has been working on foundation projects across New Zealand.



Though definitely not a typical application for the XHT250, such technique meant that instead of leaving the screw pile in the ground, it was used to predrill down to 7 m with a 330 mm diameter, then the pile was reversed and pulled out, before another one of the Hitachi excavators drove timber piles down to their required depth. It was believed that getting through the dense layers with another drive head or conventional auger setup in this case would have been more messy, not as quick and would have disturbed the ground quite a bit more compared to simply displacing the ground with a screw pile. Overall, the 25 t Hitachi excavator in combination with the Auger Torque XHT250 screw pile head completed the job successfully. ■

Website: [www.augertorque.com.au](http://www.augertorque.com.au)

Far left and left: To help complete the jobs, Moore Construction uses its Auger Torque screw pile torque heads together with Hitachi excavators.

## New crusher distributor plates boost quarry production

The Panchami Stone granite quarry is located 60 km from Bangalore, in the south of India. The company originally acquired a Sandvik Construction UH311 cone crusher and a UV312 Vertical Shaft Impact (VSI) crusher in 2014 and 2015 respectively; the latter is fitted with Sandvik's CV218 VSI. This new plant operation replaced Panchami Stone's old jaw to jaw crusher configuration, which was unable to produce the desired material fractions and end product quality.

The Sandvik wheeled semi-mobile cone and VSI crusher configuration has proved to be the ideal solution for manufacturing sand. Panchami Stone has also benefitted from improved production, reduced emissions and a lower cost per ton operation with the CV218 providing many real benefits over other autogenous VSI crushers.

The 0-36 mm granite feed material at the Panchami Stone quarry is fed from the cone into the VSI, from which the manufactured sand product is produced, at a rate of 40,000 metric tons per month. Due to its shape the sand product has proved to be superior to naturally occurring sand, thereby providing the local construction industry with a highly valued commodity.

The problem for Panchami Stone was that with a work index of 18-20, and an abrasion index of 0.5-0.6, as well as a bulk density of 1.6 cu m ton, meant that the distributor plates on the VSI had to be replaced at regular intervals. This was not only affecting production, but also proving to be very costly in both time and money.

The distributor plates Panchami Stone was using for the 85 hp rotor of the VSI had to be replaced after every 18,000 t. This meant that two to three plates had to be replaced each month, with production being affected due to increased down time and longer service intervals, which were having a negative effect on production costs.

To solve the problem, Panchami Stone decided to change its current distributor plates and finally opted for the Sandvik HX900. The new plates are designed to provide lower maintenance and operating costs, thus resulting in fewer maintenance stops. These factors can lead to higher capacity over time. In terms of wear protection solutions, the HX900 distributor plates also deliver low cost per ton. Additionally, ease of fitting is inbuilt into the design, with the new HX900 distributor plates being easily locked onto an adapter plate.



Top and above: The Panchami Stone granite quarry has fitted the HX900 distributor plates to its 85 hp rotor of its Sandvik Construction CV218 VSI, resulting in a long wear life and reducing its replacement costs by 50 percent.

The plates possess a long wear life. This is due to the design that consists of three different wear materials, and results in wear life being about five times longer than with conventional white iron distributor plates. Longer wear life means a minimum of maintenance stops, saving time on changing distributor plates.

A wear indicator clearly shows when it is time to change plates, and when it comes to changing plates, there is no need to lift off the crusher's upper section. No crane needed, and no time wasted, resulting in

easier and safer installation. This last feature is further aided as the distributor plate is split into three parts, weighing only 5 kg each. This makes handling easier and speeds up installation; a more user-friendly design resulting in safer service routines.

Following the adoption of the HX900, the distributor plates now only have to be replaced after 80,000 metric tons of production; a significant improvement of up to 500 percent, with an operational cost saving of 50 percent. ■

Website: [www.construction.sandvik.com](http://www.construction.sandvik.com)

# Stirling Lloyd's system protects major bridges in Turkey

Stirling Lloyd's Eliminator system has been chosen by the Turkish state highways agency, KGM, to waterproof two new major bridges. For the Yavuz Sultan Selim Bridge, the system covered a total of 37,435 sq m, while for the Osman Gazi Bridge it covered 76,000 sq m.

The applicators were able to apply 4,500 - 5,000 sq m of the bridge waterproofing system per day on the Osman Gazi Bridge, facilitating quick contract progression. Stirling Lloyd said this was made possible due to the speed and ease of application of the Eliminator system, together with the fact that each element of the system cures in under an hour, enabling the next element of the system to be applied immediately.

Built over the Sea of Marmara in Turkey's Izmit Bay, the Osman Gazi Bridge opened in June 2016 and is believed to be the fourth longest suspension bridge in the world. Spanning over 1.5 km, the bridge enables passengers to make the journey across the sea in just three minutes instead of joining the long queue to take the one-hour intermittent and uncomfortable ferry ride or the alternative highly trafficked 100 km detour over land.

The Yavuz Sultan Selim Bridge is part of the projected 260 km long Northern Marmara highway. It is said to be the longest combined motorway/railway bridge in the world and the eighth longest suspension bridge. ■

Website: [www.stirlinglloyd.com](http://www.stirlinglloyd.com)



Above and left: Stirling Lloyd's Eliminator system being applied on the Yavuz Sultan Selim Bridge, covering a total of 37,435 sq m.

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# Bomag hard at work on Turkey's new airport project

A new airport is being built in Istanbul, Turkey, which is expected to be the largest in the world when completed. The project site is located about 35 km northwest of Istanbul's centre, right on the coast of the Black Sea. The area, a former opencast coal mine, is characterised mainly by very rugged terrain and thus has to be levelled. To do so, it is necessary to remove 400 mil cu m of soil and fill in the resulting or existing holes. About 13,000 workers are deployed on the construction site, seven days a week in two shifts, 20 hours a day.

Bomag machines are heavily involved in the project. At the beginning of 2015, a fleet of BW 226 and BW 216 heavy single drum rollers with padfoot and polygonal drums commenced work on the construction site. A total of 136 machines, 61 of them equipped with the Bomag Terrameter (BTM) and 45 with the Bomag Compaction Management 05 (BCM 05) with GPS - both compaction control systems - are used for the compaction control. In five major areas alone, 20 rollers are working in each zone. The surfaces are paved in 40 cm layers and compacted. The compaction requirement is achieved in four passes.

To facilitate the process for the roller drivers involved,

depending on the type of material, a combination of four padfoot and/or polygon soil compactors drive behind each other on a lane, followed by a smooth drum roller that finishes and documents the compaction process.

One of the challenges posed is the daily compaction checks required. With a compacted surface area per day of about 2 mil sq m, roughly 2,500 individual tests would usually be required, which is a very costly and time-consuming process. Bomag's BCM 05 compaction control system and the Bomag GPS system offer an efficient alternative. They monitor the surface and collect all the relevant data. This is then transferred to a central laboratory, which compiles and reads it. An external consultant responsible for approving the tested areas evaluates the resulting single documents - an average of 20 per day - and checks the compaction processes. This guarantees complete documentation that in turn ensures a smooth and efficient construction process.

According to Bomag, the single drum rollers are still working on site before the targeted opening of the first phase in February 2018. ■

Website: [www.bomag.com](http://www.bomag.com)



Turkey's new airport is under construction. It is expected to be the world's largest airport upon completion.



A total of 136 Bomag machines are involved in the project. In five major areas alone, 20 Bomag rollers are working in each zone to compact the surfaces in 40 cm layers.



Above and right The BCM 05 compaction control system and the Bomag GPS system ensure that the daily compaction checks required are documented smoothly.



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# JCB REMAINS RESILIENT IN SOUTHEAST ASIA

*Despite difficult economic conditions in the developing markets, JCB keeps moving forward with new innovations. Tom Cornell, managing director of JCB Southeast Asia, recently shared with Southeast Asia Construction the company's latest machines and technologies and how they will impact on the construction industry in the region, both now and in the future.*

**1. Mr Cornell, JCB is a well-known name in the Indian market. The company has even built what is believed to be the world's largest backhoe loader factory in Ballabgarh. Added to that, growth in India has reportedly returned for JCB while other markets are still struggling. How is your progress in Southeast Asia compared to that in India?**

**Tom Cornell (TC):** Our growth in Southeast Asia has been quite modest over the past five to six years, given the market is dramatically smaller than it was since the 2011 peak. JCB has been focusing on some major changes to our distribution network, so that when the market starts to get stronger we will be ready for growth.

You know, the slowdown in the Chinese market has had a mixed effect on us. Positively, JCB China is now more focused on export and moving the production of our 20-t excavator has helped reduce import duties across Southeast Asia and also increase the frequency of shipping. But on the negative side, the slowdown has affected investments in Southeast Asia and it has made Chinese OEMs even more aggressive in the region.



Left: Tom Cornell, managing director of JCB Southeast Asia.

Below: The iconic JCB 3CX backhoe loader is also a popular model in Southeast Asia. Here, the machine is being used at a construction site in Kuala Lumpur, Malaysia.



Above and below: JCB excavator (above) and telescopic handler work on various construction projects across Southeast Asia. The machines are designed to be simple and easy to maintain.



**2. You mentioned about making some changes to the distribution network in the region. Can you tell us a little bit about this?**

**TC:** Basically we now have a better distribution network and much greater coverage of the market. We continue to strengthen our regional presence through existing dealers - including Indonesia, Vietnam and the Philippines - as well as expand our distribution network with the appointment of new dealers including CPL Yoma in Myanmar and DKSH in Thailand.

Since 2011, Thailand has doubled in size and is now the region's largest market for us. Indonesia remains a critical market and offers the greatest single opportunity for growth. Markets such as the Philippines, Singapore, Malaysia and Vietnam also remain focal points.

**3. Did you also have to make other changes in this region?**

**TC:** Yes, increasing our product range is also one of our key drivers of growth. We continue to lead the backhoe loader and telescopic handler markets in Southeast Asia; but we are also placing greater emphasis on the Heavyline products with some unique offerings such as the VM116 soil compactor and the JS305 tracked excavator for the 30-t market.



Another main driver of growth is our technological development. The introduction of LiveLink allows our dealers to track our customers' machines and ensure we are maximising uptime.

I also see rental becoming a bigger piece of the market. It is a very large segment of the market in the US and Europe; but I see more and more customers in Southeast Asia wanting to rent a machine rather than owning, especially in Thailand, Indonesia and Singapore. So we are adjusting to this new approach as well.

**4. It seems that there is a trend towards telematics in the construction industry nowadays. Could you share the benefits of this system with us?**

**TC:** JCB Livelink is an innovative telematics solution that enables JCB owners to monitor and manage their machines remotely. This can be done simply via mobile devices and internet connection.

Our JCB customers can now manage machine maintenance easily and enjoy greater machine uptime as data is communicated between the machine and JCB data centre. This also helps to improve maintenance planning because critical machine alerts and maintenance history records are available.

JCB Livelink also tracks and transmits fuel levels in real-time so customers can monitor and analyse fuel consumption using the analysis function throughout the day.

In addition, customers can enjoy greater security benefits and have a peace of mind with Livelink's security features; for instance, fleet customers can set predetermined zones so that Livelink's real-time geofencing alerts inform them when their machines move out of a specific area. Also, real-time curfew alerts inform fleet owners of unauthorised usage straight to their mobile devices.

**5. Another new development you recently introduced is a multipurpose machine, the Hydradig. Do you think this is also the direction where the industry is going?**

**TC:** Pretty much so! The Hydradig is a revolutionary product - it can operate as a digging, lifting, loading and tool-carrying machine, and is particularly suitable for congested urban environments or on busy road networks. Our customers have been telling us they need a single machine solution, so this is it.

The JCB Hydradig is a typical example of how innovation is part of JCB's DNA. It was four years in the making and a project directly sparked by our chairman, Lord Bamford. The machine is intended for the global market, but the focus is currently on the UK and Europe. We look forward to introducing it to the Southeast Asia in time to come.

**6. How do you differentiate your products for Southeast Asia from those for other markets?**

**TC:** This is one of the biggest advantages that JCB can offer to our customers. Product development does not always mean that machines have to become more electrical or sophisticated; in fact, JCB has developed products specifically for developing markets like Southeast Asia that are simpler than those for more developed European markets.

Our JS205 excavator, backhoe loaders and telescopic handlers are all powered by engines with mechanical fuel pumps. This makes the products easier to maintain and more resilient to poor fuel. Often our machines are working in very remote rural areas and therefore if they encounter problems, our customers don't have to wait for a laptop to arrive to diagnose the fault.

The engines also offer very competitive levels of fuel economy, which saves our customer thousands of dollars over the life of the machine. Fuel today is always the second biggest cost for the customer after the cost of the product. Low fuel consumption in all JCB products



JCB's latest innovation, the Hydradig, is a multipurpose wheel excavator that can operate as a digging, lifting, loading and tool-carrying machine. The development of the product was sparked directly by JCB's chairman, Lord Bamford (pictured).



Above: JCB's plant in Ballabgarh, near New Delhi, India, is said to be the biggest backhoe loader factory in the world.

Left: JCB also has an excavator plant in Pune, India.

reduces customers' costs, makes our customers more profitable and we can prove this when we demonstrate the product.

**7. Earlier you also said that Chinese OEMs are becoming more aggressive in this region, following the slowdown in the Chinese market. How do you stay on top of such tougher competition?**

**TC:** Well, just like other OEMs, we continually face challenges across the region over which we have little influence - currency fluctuations, investments in infrastructure, political instability, government tenders, etc. However, there are matters we can have an influence on in order to overcome the challenges in the region, and this is what we do: better products for the region, improving after-sales supports, lower cost of ownership for the end users, developing our distribution, recruitment and training, and of course, building the JCB brand. ■

Website: [www.jcb-singapore.sg](http://www.jcb-singapore.sg)

# CONCRETING WITH EASE

The new generation of admixture from BASF - MasterEase - is designed to deliver low-viscosity yet stable concrete mixes. It aims to improve the speed, durability and sustainability of construction projects around the world. The product has recently been introduced to the Singapore market.



MasterEase significantly reduces the viscosity of concrete.

**In MasterEase**, BASF has created a new polymer technology that improves the rheological properties of fresh concrete, significantly reducing its viscosity. As a result, the time and effort for pumping and placing the concrete can be minimised, making installation much easier and faster.

“Compared to our MasterGlenium admixture, which offers a standard concrete mix using PCE (polycarboxylate) technology, MasterEase reduces the viscosity of concrete by up to 30 percent. Due to this, customers have feedback that the pumping output has increased by up to 20 percent and mixing efficiency by up to 15 percent. If you need to carry out a long distance concrete pumping, MasterEase is a perfect solution,” said Arnold De Silva, head of BASF’s Construction Chemicals Division for Singapore, Malaysia, Myanmar, Laos and Cambodia.

“Based on our customers’ feedback, we are the only manufacturer that offers this kind of admixture at the moment,” he added. “Innovation is an important driver for our long-term growth. We collaborate with our customers to continuously work on new

products and solutions as well as innovative technologies. With the launch of MasterEase, we are offering our most advanced, and globally approved products in Singapore to support our customers in overcoming construction challenges and to successfully realise their projects.”

## High-strength concrete

MasterEase will benefit concrete producers and users in many ways. The system is flexible and can be adapted to challenging situations such as temperature and material variations. It is particularly suitable for concrete mixes that are designed and optimised for advanced engineering properties and sustainability. For example, high-strength concrete with low water/cement ratios, and mixes with higher levels of secondary cementitious materials (SCMs) to reduce the CO<sub>2</sub> footprint.

“The mix designs of MasterEase admixture are tailor-made and optimised for each market’s requirements and raw material availability,” said Mr De Silva. “The strength of MasterEase comes into play in projects that encounter specific challenges, like high-

rise structures of 500 m and taller, which typically require high-strength concrete.”

One of the major projects in Asia where MasterEase has been involved is the Signature Tower of Tun Razak Exchange development in Malaysia. The system was used for the record-breaking continuous concrete pour of 19,3000 cu m to cast the building’s raft foundation. The work was performed within 60 hours. “It was a massive operation and such result would have been very difficult to achieve without MasterEase,” said Mr De Silva.

Another notable building project using MasterEase includes the Four Seasons Private Residences Bangkok, Thailand.

Since its debut in 2015, MasterEase has been playing an important role in projects around the world. The product expanded into Asia Pacific in November 2015, with Australia being the first market to enter. It is now available in Indonesia, India, Vietnam, Hong Kong, Japan, Thailand, Malaysia and Singapore.

“MasterEase was first launched in Turkey in June 2015 for the European market. More than six months later, our expectations have been exceeded,” said Mr De Silva. “Some advantages of this new technology only become apparent in practice. For example, our customers have noted the advantages of faster pumpability and consequently the reduced downtime of their ready-mix trucks. The feedback from our customers has consistently been very positive.

“For our customers, MasterEase represents a simple solution to an existing problem that performs better than previous



Above: MasterEase is ideal for use in high-rise projects of 500 m and taller, which typically require high-strength concrete.

Far left: Real-time experience on how easy it is to mix concrete with MasterEase.

Left: The concrete mix with MasterEase is also smooth and easy to trowel, reducing the time and effort for pumping and placing the concrete.

systems. It is a breakthrough both in technology and in our usual way of mixing and placing concrete,” he asserted.

**Productivity, sustainability and safety**

Speaking about current issues faced by the concrete industry, Mr De Silva explained, “Today, modern concrete mixes are often optimised for sustainability. To this end, a significant amount of cement is frequently exchanged for alternative materials like fly ash or blast furnace slag. In comparison to conventional mixes, this often leads to a rigid concrete mix with poor workability. As a result, there will be significant problems when pumping and placing the concrete on site.

“Suitable sand is also in short supply in many countries. For environmental reasons, there are more and more restrictions on new approvals for the extraction of natural sand resources. The remaining sand often leads to concrete that is quite challenging in terms of its rheological properties.

“All these problems can be reduced with MasterEase,” continued Mr De Silva. “This admixture enables a higher usage of manufactured sand, therefore increasing the use of SCMs, which results in lowered environmental impact.

“MasterEase also reduces the stickiness (viscosity) of high-strength concrete and thanks to this, it has enhanced productivity at the ready-mix plant and increased efficiency in mixing, pumping and finishing the concrete mix. This in turn lowers energy consumption, wear and tear, and the need for additional labour, and thus reduces environmental impact. The superior placing and finishing also leads to better quality concrete and thereby higher durability of the concrete structures.

“With reduced viscosity, along with low water/cement ratios and high dosages of mineral additives and supplementary cementitious materials, MasterEase helps to ease the high environmental challenges on the construction industry.”

But that’s not all, MasterEase has another benefit. “The use of MasterEase can raise safety in construction projects,” said Mr De Silva. “With less people on site, the risk of accidents on personnel ultimately decreases.” ■

*Website:*

*www.master-builders-solutions.basf.com.sg*

Right: The demo of MasterEase mix versus Standard concrete mix shows how flowability is greatly improved with MasterEase.



Top: MasterEase aids the record-breaking continuous concrete pour of 19,3000 cu m in 60 hours for the Signature Tower of Tun Razak Exchange development, Malaysia.

Above: Arnold De Silva, head of BASF's Construction Chemicals Division for Singapore, Malaysia, Myanmar, Laos and Cambodia, speaking at the MasterEase launch in Singapore.

Left: MasterEase allows high-strength concrete of 80 MPa to be pumped and placed on site with ease for the Four Seasons Private Residences Bangkok, Thailand.





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Liebherr LRT 1090-2.1 rough-terrain crane.

The two models will also be displayed at Conexpo 2017. Liebherr Booth: G4637

# READY TO ROLL

**Liebherr has extended its mobile crane range with a new series of rough-terrain cranes in the 90-t and 100-t classes. There are currently two models, namely LRT 1090-2.1 and LRT 1100-2.1. Southeast Asia Construction visited the company’s manufacturing facility in Ehingen, Germany, to find out more about these products.**

Liebherr manufactured rough-terrain cranes in the 1980s until mid 1990s – with a lifting capacity of 25 to 80 t. According to the company, the objective at that time was to round off the range of all-terrain and crawler cranes and build on Liebherr’s global market leadership in these segments. After the company discontinued its rough-terrain crane production, the focus was mainly on its all-terrain and crawler cranes.

Recently, due to the increasing demand from its customers for rough-terrain cranes, Liebherr decided to re-enter this market. ‘Considering our present footprint in the industry, the rather constant outlook from a global economic perspective and the insistent appeal of our customers to re-enter into rough-terrain-crane business, we looked deeper into this topic,’ said Christoph Kleiner, managing director sales at Liebherr-Werk Ehingen GmbH.

The development of these new cranes was preceded by extensive

market surveys and analysis into the requirements for modern rough-terrain cranes, particularly in the North American market, said Liebherr. In addition to the cranes’ capacity, their safety - particularly one resulting from ease of operation - was a main focal point in the development of the cranes. ‘The aim is to keep the product simple and safe,’ said Mr Kleiner.

‘Our new cranes should meet the requirements of rough-terrain cranes in their class - from off-road pick & carry RT (rough-terrain) cranes, up to and including flexible industrial cranes in large industrial plants,’ added Dr Ulrich Hamme, managing director of construction and development, Liebherr-Werk Ehingen GmbH.

The two LRT models are based on the same basic technical concept. The crane chassis and turntable are almost identical; the differences relate to the boom length, telescoping technology, ballast weight and lifting capacity.

**Safety first**

The new cranes have been designed with high safety levels in mind, said Liebherr. Both models are equipped with an outrigger monitoring system as standard. The support status, on tyres or outriggers, can be detected automatically and saved to the crane controller. The attachment of the ballast to the turntable and the installation of the optional double folding jib, including its angle adjustment, are also recorded and monitored.

The VarioBase variable support base contributes to enhancing safety. It allows each individual outrigger beam to be extended to arbitrary lengths. The crane work is controlled by the load moment limiter within the Liccon controller, which calculates the maximum load capacities precisely for the current situation. This prevents accidents by human error during the assembly process and when hoisting loads. The VarioBase also provides greater flexibility on site. As a result of the increased lifting capacities when hoisting over the supports, the crane can hoist loads normally reserved for the next higher crane class, explained Liebherr.

Safety is also enhanced by providing a comfortable working environment for the operator. For example, the cabin is 220 mm wider than other standard cabins on the market, according to Liebherr. It can be tilted backwards for better comfort when hoisting loads to great heights. Clear, self-explanatory controls make the crane easy to handle, as they help the operator concentrate on the job. A cooler and USB charging socket are also standard features in the cabin.

There are ladders, a large number of handles and an electrically extending platform on the cabin to ensure safe access to the crane. Both models also have a wide range of storage boxes for accessories, rigging equipment and support timber, plus a storage facility for the crane hook.



Above and below: Liebherr LRT 1100-2.1 rough-terrain crane being displayed at the company's manufacturing facility in Ehingen, Germany.





**High lifting capacities**

The 100-t (110 US t) LRT 1100-2.1 has a 50 m telescopic boom with a ‘telematik’ telescoping system, on which the various telescoping sections can be extended independently with a single cylinder and then pinned to the telescopic section above. This telescoping system is simple and user-friendly as excellent lifting capacities over the entire radius range can be achieved with just two telescoping modes, Strong or Long. The crane has a counterweight of 14 t to ensure high stability.

The 90-t (100 US t) LRT 1090-2.1 features a 47 m telescopic boom and a 12 t counterweight. Its telescoping system consists of a two-stage hydraulic cylinder with a rope extension mechanism. The boom can also be extended easily with two telescoping modes, Strong or Long. The extension mechanism on both crane models has been designed for high telescoping lifting capacities.

A second winch and the rooster sheave are included as standard on the basic machine for two-hook operation. As an option, a 10.5 – 19 m double folding jib can be installed on the telescopic boom. It can be attached at an angle of 0°, 20° or 40°.

**Manoeuvrable, easy to transport**

The new Liebherr rough-terrain cranes have also been designed to offer excellent off-road capability and manoeuvrability. Both models are powered by a Cummins diesel engine,



Top left: Both the LRT 1090-2.1 and LRT 1100-2.1 rough-terrain cranes are designed based on the same basic technical concept - the chassis and turntable are almost identical; the differences relate to the boom length, telescoping technology, ballast weight and lifting capacity.

Above and left: The cranes have a spacious cabin, providing a comfortable working environment for the operator. It can be tilted backwards for better comfort when hoisting loads to great heights.



which meets all current emissions regulations. The engine develops 194 kW and supplies a maximum torque of 990 Nm. A six-speed powershift transmission from Dana and large 29.5 R25 tyres guarantee the required off-road capability for the cranes. Their maximum speed is 25 km/hr. All-wheel and crab steering ensure easy handling and high manoeuvrability in constricted conditions.

The LRT cranes measure 3.87 m in height and 3.3 m in width and can be transported on public roads with a low loader. Their curb weight is less than 55 t with complete equipment including ballast, or under 40 t without ballast and without equipment. This means that the cranes can also be transported worldwide at low cost. They can be prepared for use quickly and are easy to assemble once they have reached the site. The outrigger pads, which remain inside the width of the vehicle, contribute to this since they do not have to be removed for transport.

The LRT 1090-2.1 and LRT 1100-2.1 meet the global safety standards and comply with all global regulations such as the US standard ANSI B30.5, European EN 13000, Australian Standards (AS) and Russian GOST standard. According to Liebherr, sales of these new rough-terrain cranes will start in early 2017, and the delivery of the first units is scheduled to take place in the second half of 2017. ■

Website: [www.liebherr.com](http://www.liebherr.com)

Top, left and right: The new Liebherr rough-terrain cranes meet the global safety standards and comply with all global regulations.

Above left: Dr Ulrich Hamme (left), managing director of construction and development, Liebherr-Werk Echingen GmbH; and Christoph Kleiner, managing director sales, Liebherr-Werk Echingen GmbH.

Above: The Liebherr rough-terrain cranes are manufactured at the company's Echingen factory.



Volvo prototype autonomous A25F articulated hauler.

# XPLORING THE FUTURE

**Southeast Asia Construction recently joined Volvo CE's Xploration Forum in Eskilstuna, Sweden, to get an exclusive look at the company's futuristic concepts and innovations - electromobility, autonomous machines and total site solutions - which have the potential to transform the construction industry in the future.**



Volvo prototype autonomous L120 wheel loader.



The prototype autonomous A25F and L120 working together. In a one-hour comparison, it was found that the autonomous wheel loader could reach the equivalent of 70 percent of that of a skilled operator's productivity levels when loading and unloading.

The innovations showcased at the Xploration Forum are ongoing research projects that are not commercially available at this stage. However, the company believes that some - or many - of the features can be applied to the construction industry in the future.

"Although this technology may be years away from production, it will undoubtedly influence our future offering and has the potential to transform the construction industry as we know it. The progress our engineers are making is exciting," said Martin Weissburg, president of Volvo CE and member of the Volvo Group Executive Board.

According to Mr Weissburg, once these new innovations are materialised, they would be suitable for the global market. "The world is changing more than ever before, and it's going to have a significant impact on our lives, so we need to change with it," he said. "The need for changes is even greater in countries like India and China, especially when it comes to environmental needs."

### Sustainable future

Mr Weissburg stressed that although the industry must embrace and keep up with new technologies, it "should not change just for the sake of new technologies. Change is a progress," he said.

"At Volvo CE, we are committed to contributing to sustainable development. We are developing technologies connected to electromobility, intelligent machines and total site solutions that will benefit our customers and the environment by contributing to increased machine performance, productivity, efficiency, safety and sustainability. Our future products and services will play an important part in building a sustainable society," explained Mr Weissburg.

"Volvo CE is at the forefront of technological development," he continued. "Each year, the Volvo Group invests billions of Swedish Kronor in research and development to drive the evolution of new innovations."

Mr Weissburg further highlighted the importance of four key technology challenges, called Triple Zero and 10x: zero emissions, zero accidents, zero unplanned stops and 10x higher efficiency. Firstly, 'zero emissions' refer to zero emission machines, which will help make customers' businesses more environmentally sustainable.

Secondly, with pioneering safety innovations, machines could instinctively avoid accidents, resulting in 'zero accidents' and generating a completely safe working environment.

Thirdly, Volvo also aims to create a working environment without machine breakdowns, where machines can predict and plan their own maintenance, leading to 'zero unplanned stops'. And lastly, 10x higher efficiency means that the electrification of construction equipment and site optimisation will dramatically reduce energy consumption.

"We believe that our clear focus on electromobility, intelligent machines and total site solutions will help us achieve these ambitious goals and pave the way for a sustainable construction industry," said Mr Weissburg.

The new innovations at the Xploration Forum were presented under the umbrella of 'Volvo Concept Lab' – a new Volvo Group initiative that aims to communicate its future innovation and solutions. From now on, Volvo-branded companies within the Volvo Group will showcase their research and development projects under this technology communication platform.

### Autonomous machines

One of the highlights is the development of autonomous machines. Volvo has upgraded its L120 wheel loader and A25F articulated hauler with autonomous technology, but they are still in a prototype phase. Once a solution is finalised, the technology could be applied to other products in Volvo CE's range.

At the Xploration Forum both prototype machines were used together - the wheel loader filled the articulated hauler, before dumping its load and repeating the cycle. In a one-hour comparison it was found that the autonomous wheel loader could reach the equivalent of 70 percent of that of a skilled operator's productivity levels when loading and unloading. This is not just theoretical – Volvo CE said this autonomous wheel loader has also done 'real work' for its customer at an asphalt plant in Sweden.

"The demonstration machines were programmed to work together and carry out a specific set of actions on a pre-defined



Jenny Elfsberg, director of emerging technologies at Volvo CE.



Martin Weissburg, president of Volvo CE and member of the Volvo Group Executive Board.

Top and above: Volvo’s LX1 prototype hybrid wheel loader can deliver up to a 50 percent improvement in fuel efficiency, with a significant reduction in emissions and noise pollution.

route,” explained Jenny Elfsberg, director of emerging technologies at Volvo CE. “The machines can perform the same task over and over again, along a fixed route, for a relatively long period of time. But it’s still early days for this technology, we are working on developing solutions that have the required safety and performance levels that the market will accept.

“Currently these prototype machines do not communicate with each other, and machine-to-machine communication technology – where machines ‘talk’ to one another and to a central control point – is crucial when it comes to avoiding collisions and facilitating an efficient flow of equipment.”

Ms Elfsberg continued, “Autonomous machines will increase safety in hazardous working environments and eliminate the possibility of accidents caused by human

error. They will also perform repetitive tasks more efficiently and precisely than a human operator and, because machines will be operated in the most efficient way, customers will benefit from improved performance, productivity, fuel efficiency and durability.”

Volvo CE has been conducting research on autonomous machines for more than a decade. “We are starting to see systems that are less dependent on operator skills, ones that support operators with guidance or control primary functions,” said Ms Elfsberg. “In the future we will see increased machine autonomy and the operator will act more in a supervisory capacity. This will provide less stressful, more interesting work for operators, with perhaps several machines being controlled remotely by one operator. Looking ahead, I imagine that autonomous machines will be smaller and more robust. There will be no need for a cab or suspension.”

She added, “Of course, some tasks are so complicated that you really need to feel what you’re doing, and in those cases we will still need operators controlling the machines from inside the cab.”

### Hybrid wheel loader

Another innovation from Volvo CE is the LX1 prototype hybrid wheel loader, which can deliver up to a 50 percent improvement in fuel efficiency, with a significant reduction in emissions and noise pollution.

The LX1 incorporates a driveline that consists of electric drive motors mounted at the wheels, electric hydraulics, an energy storage system, a significantly smaller diesel engine and new machine architecture. The prototype – which has 98 percent new parts and a fundamentally new machine design – is capable of doing the work of a wheel loader that is one size larger, said Volvo CE.

The Volvo Group defines electromobility as ‘commercial vehicles and machines that can utilise an electrical motor to propel or to perform the main purpose of the machine’. A hybrid is classified as a machine that uses more than one power source and captures and reuses energy that would otherwise be wasted. It is a prerequisite that the machine has the capability for energy storage to count as a true hybrid.

Volvo CE has been working on electromobility and hybrid technology since 1998. The company has long-term plans to develop products and services for electromobility, including electric hybrids and electric sites.

“Although we believe that there will be a major shift towards electric hybrid technology in the future, our customers, quite rightly, want improved efficiency now. We are delivering this through more conventional technologies and soft offers,” said Scott Young, electromobility programme manager at Volvo CE.

“This is because we need to meet customers’ immediate expectations in terms of total cost of ownership (TCO). A large part of TCO is energy cost, but other significant expenses include purchase price and maintenance. These aspects help drive our hybrid development plans.

“Therefore, before we launch a machine like the LX1, you can expect to see elements of this design incorporated into our products. This supports short and mid-term developments and requirements while the market continues to accept the technology, technology improves and the cost of new technologies decreases.”

Volvo CE has teamed up with its customer Waste Management – one of the largest environmental services and recycling companies in North America – to field test the LX1. Waste Management has facilities in California, the US, where the LX1 is currently performing fuel efficiency and emission reduction tests.

“From the minute we were introduced to the LX1 we knew we wanted to work with Volvo CE to prove the concept in the real-world environments we operate in,” said John Meese, senior director of heavy equipment at Waste Management. “We are anticipating excellent results when it comes to reducing the use of fossil fuels and lowering exhaust emissions. An additional benefit is the dramatic reduction in noise pollution.”

Mr Young said, “Although it may be possible to realise fairly high levels of fuel savings and productivity gains in prototype form, when it comes to serial production



Top and above: The Volvo HX1 prototype autonomous, battery electric, load carrier is part of a research project that predicts up to a 95 percent reduction in carbon emissions and up to a 25 percent reduction in total cost of ownership.

you have to consider cost and ROI. Hybrid technologies are still a relatively expensive solution and adoption has been slow. This is because the benefit of current hybrid machines on the market isn’t significantly higher than conventional technologies, so it takes longer to achieve payback on your investment.

“However, the cost of energy storage systems like lithium ion batteries is steadily decreasing, along with other technology, so that’s starting to make hybrids more attractive financially. There are still opportunities to further optimise conventional technology – and these developments will compete with hybrid technology for some years. Although having said that, we are currently in a period of exponential technology growth and I believe this industry shift will move at a faster pace than others have in the past.”

### Autonomous electric load carrier

Volvo CE has also unveiled its new concept HX1 autonomous, battery electric, load carrier. This prototype machine is one element of an electric site research project that predicts up to a 95 percent reduction in carbon emissions and up to a 25 percent reduction in total cost of ownership.

The project aims to electrify a transport stage in a quarry – from excavation to primary crushing and transport to secondary crushing. It involves developing new machines, work methods and site management systems. As well as a fleet of HX1s, other prototype machines that make-up the electric site system include a hybrid wheel loader and a grid-connected excavator. New technology encompasses machine and fleet control systems and logistic solutions for electric machines in quarries.



Above and left: The HX1 prototype autonomous load carrier working together with the LX1 prototype hybrid wheel loader. They are part of the same project that aims to electrify a transport stage in a quarry – from excavation to primary crushing and transport to secondary crushing. The project is being carried out by Volvo CE together with its customer Skanska Sweden, the Swedish Energy Agency and two Swedish universities. It started in 2015 and is due to be completed in late 2018.

“By using electricity instead of diesel to power construction equipment in a quarry, we have the potential to deliver significant reductions in fuel consumption, CO<sub>2</sub> emissions, environmental impact and cost-per-tonne. The electrification of construction equipment will produce cleaner, quieter and more efficient machines – this represents the future of our industry,” said Johan Sjöberg, technical specialist in site automation at Volvo CE.

To carry out the project, Volvo CE has teamed up with its customer Skanska Sweden, the Swedish Energy Agency and two Swedish universities – Linköping University and Mälardalen University.

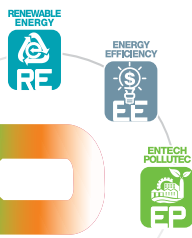
Volvo CE is coordinating the project and is in charge of developing the machines and systems. Skanska Sweden is providing logistical solutions, application relevance and job site knowledge. The Swedish Energy Agency – a government agency for national energy policy issues – is helping to fund the project and the universities are carrying out research. Three PhD students are looking at energy management for electric vehicles, safe and robust software controls and energy-optimised work cycle control.

The project started in October 2015 and is due to be completed in late 2018. Volvo CE is currently developing and testing the technologies, concept and prototypes in-

house. Skanska Sweden will incorporate the demonstration machines into its operations and test the electric site concept at a quarry in western Sweden, for 10 weeks at the end of 2018. After this, Volvo CE will examine the project results to see if the concept is viable for the industry.

The SEK 203 million initiative is jointly funded: Volvo CE has invested SEK 129 million, the Swedish Energy Agency has provided SEK 65 million (it awarded SEK 59 million to Volvo CE, SEK 5 million to Linköping University and SEK 1 million to Mälardalen University) and Skanska Sweden has contributed SEK 9 million. ■

Website: [www.volvoce.com](http://www.volvoce.com)



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## SINGAPORE'S PREFABRICATED HOMES

The Housing and Development Board (HDB) has been using precast components to build flats in Singapore since the 1980s. A project currently underway in Sembawang in the northern region of the country is among the latest, although this one has a notable difference. It involves precast modules with bathroom fittings that are completely built-in.

Such development reflects a growing trend in Singapore towards the use of prefabricated construction, which delivers both time- and cost-savings. The contractor on the project, LC&T Builder, has even developed its own capability to create some precast modules, allowing it to exercise greater control over work schedules without

having to depend on other companies to deliver precast units and components.

Founded in 1971, LC&T Builder is based in Singapore with HDB developments comprising 90 percent of its work. The company is presently working on another HDB project in Jurong West, as well as a warehouse on Harvey Road and a condominium in Pasir Panjang. The company currently has 100 employees based in its offices, with an additional 200 to 300 on-site construction workers.

### Heavy lifting solution

On the Sembawang HDB project, the built-in plumbing and fittings



saves time during construction but it adds a new challenge—increased weight. For LC&T Builder, that meant finding a tower crane that had a large enough capacity to lift the 17 t prefabricated bathroom units (PBUs), yet could still fit onto a congested job site.

“As we looked around, most of the cranes had a maximum capacity of 16 t and didn’t have the load charts we needed for the lifting and positioning of the bathrooms,” said Huei Teck Low, senior project manager at LC&T Builder, explaining the dilemma. “We called in crane supplier Manta Equipment, and the company suggested the 20 t Potain MCT 385. After seeing the cranes in action, we knew they’d be right for this project. The capacity of the cranes is their biggest selling point.”

LC&T Builder rented a total of 10 MCT 385s from Manta. Though a redesign eventually rendered the precast and prefabricated bathroom units lighter at 12 t - and under the maximum capacity of the cranes - the jobsite’s tight working quarters still presented a challenge.



Top (left and right) and above: A new residential development in Singapore is currently under construction, incorporating prefabricated bathroom units (PBUs).



“Crane layout on all HDB developments tend to be quite constrained because the construction area extends close to the borders of other properties. There were also a 6 m driveway and 2 m border that we needed to consider,” explained Mr Low.

LC&T Builder configured the cranes with relatively short jibs, ranging from 25 to 35 m, so as to avoid over-swing of neighbouring properties. The maximum jib length that the MCT 385 can accommodate is 75 m.

Starting at 35 m in height, the company steadily climbed the MCT 385 cranes as construction of the building rose, topping out at 55 m. Over the course of the project, the cranes will lift some 35,000 loads for the development’s 1,012 apartments.

Aside from the precast and prefabricated bathrooms, some of the heavier loads that the cranes have to deal with include lift walls and staircase walls. These sections

weigh approximately 7 t, while other precast sections typically weigh about 5 to 6 t. The cranes are expected to leave the worksite once the last of the modules are lifted into place, and the project is slated for completion in 2017.

“The MCT 385s have proven to be very reliable machines so far in this project. Their lifting ability and adaptability to compact worksites have helped us stay on course – and even speed up in sections,” said Mr Low.

Manta Equipment’s principal businesses are the rental and trading of tower cranes, trading of mast-climbing work platforms and maintenance services for tower cranes. The company has been operating in Hong Kong since 1975 and opened an office in Singapore in 1997. It now serves the construction and infrastructure sectors in Hong Kong, Macau, Singapore and Vietnam. ■

Website: [www.manitowoccranes.com](http://www.manitowoccranes.com)

Above left: The use of PBUs saves time during construction but it adds a new challenge – increased weight. For this, LC&T Builder needed to find a tower crane that had a large enough capacity to lift the 17 t PBUs, and the contractor finally chose the 20 t Potain MCT 385.

Above: LC&T Builder rented 10 MCT 385s from Manta Equipment. Over the course of the project, the cranes will lift some 35,000 loads for the development’s 1,012 apartments.

## SINGAPORE GOVERNMENT FURTHER REINFORCES CONSTRUCTION PRODUCTIVITY

In October 2016, the Building and Construction Authority (BCA) announced that it has awarded a total of S\$2 million to four projects under an inaugural grant call for construction productivity under a research fund by the Ministry of National Development (MND). These research projects will focus on solutions to drive Design for Manufacturing and Assembly (DfMA) in the sector, with as much on-site construction works shifted to off-site prefabrication and automation in a factory environment, as well as improving integration across the construction value chain.

Furthermore, Singapore’s Minister for National Development and Second Minister for Finance, Lawrence Wong, also shared the upcoming measures to further improve productivity in the built environment sector. One of them is that more Government Land Sale (GLS) sites will be required to adopt productive construction

methods like Prefabricated Pre-finished Volumetric Construction (PPVC), where entire flats complete with internal finishes and fittings are constructed off site before they are transported to site for installation. The government will also look into specifying productivity outcomes for GLS sites without mandating specific technologies and improving upstream collaboration between developers, architects and contractors to reduce reworks downstream.

In addition, to help firms improve collaboration and enhance the construction management process, BCA will be launching the Codes of Practice (CoP) for BIM e-submission. BCA will work towards making the CoP mandatory for building and structural plan submissions in the future.

The CoP guides the industry on standardising the type of



Above: LC&T Builder configured the cranes with relatively short jibs, ranging from 25 to 35 m, so as to avoid over-swing of neighbouring properties. The maximum jib length that the MCT 385 can accommodate is 75 m.

Top left, above left and left: This HDB project reflects a growing trend in Singapore toward the use of prefabricated construction, which delivers both time- and cost-savings. LC&T Builder has even developed its own capability to create some precast modules.

information to include in their BIM submissions and will greatly improve the efficiency in which regulatory agencies check plan submissions. It will also facilitate information exchange across the various building disciplines, thereby helping firms to identify and address problems upfront before construction.

Lastly, there will be more emphasis on productivity in BCA's ninth edition of the Construction Quality Assessment System (CONQUAS), where firms will be recognised for adopting productive technologies and materials.

CONQUAS was introduced in 1989 to measure the workmanship quality achieved in a new building project. Since then, it has undergone various changes to improve the system of quality assessment. The ninth edition is aimed at strengthening the existing scheme/criteria to better promote and recognise the synergies

between productivity and quality. It was developed with two main objectives, among which is to promote the adoption of DfMA, which supports both quality and productivity. More bonus points will be awarded to projects to further encourage the use of prefabrication technologies and productive materials, which lead to higher quality and productivity. This supports the productivity drive in the built environment sector and recognises the efforts of builders who adopt less labour-intensive design and material choices. These include the use of PPVC, PBU, mass engineered timber such as cross laminated timber/glued laminated timber and productive materials such as engineered wood and vinyl flooring. The other objective of the ninth edition is to ensure the CONQUAS score will be commensurate with end-users' expectations on workmanship quality. ■

# Tunnelling and underground projects in Asia excel

The International Tunnelling and Underground Space Association (ITA) organised the second edition of ITA Tunnelling Awards on 10 and 11 November 2016, which recognise and reward excellent achievements and innovations in underground infrastructures worldwide. The event took place in Singapore for the first time, held at the Marina Bay Sands Hotel.

According to ITA, Singapore was chosen to be the host country as it provides an inspiration in its approach to the use of subterranean space. Furthermore, it is part of the Asian region

where the tunnelling and underground space market is becoming more and more important.

The first day of the event featured a technical conference focusing on innovation and productivity in the tunnelling industry through high-profile keynote lectures. This was followed by the awards conference on the second day, during which stakeholders of the pre-selected entries presented the last updates of their underground infrastructure projects.

The awards are divided into nine categories, which include: Major Tunnelling Project of the Year; Tunnelling Project of the Year; Outstanding Tunnelling Project of the Year; Renovation/Upgrading Project of the Year; Technical Innovation of the Year; Environmental Initiative of the Year; Safety Initiative of the Year; Innovative Use of Underground Space; and Young Tunneller of the Year.

ITA is a non-profit and non-governmental international organisation, which aims to promote the use of underground space as a solution to sustainable development. It was founded in 1974 and is based in Lausanne, Switzerland. ■

Website: <https://awards.ita-aites.org>



Above left, above and left: ITA Tunnelling Awards 2016 was held in Singapore, recognising excellent achievements and innovations in underground infrastructures worldwide.

## Major Project of the Year (over €500 million)

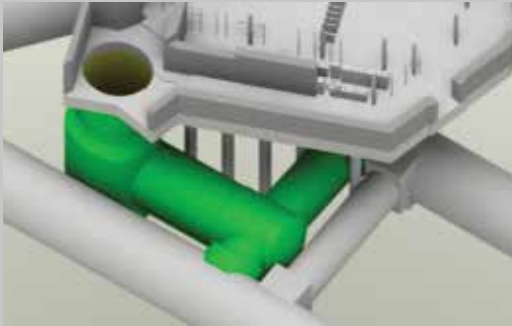
### New Guanjiao Tunnel on Qinghai-Tibet Railway, China



New Guanjiao Tunnel is a key project of the second line of Xining-Golmud section of Qinghai-Tibet Railway, with a total length of 32,690 km. This twin, single-track tunnel has an average elevation of 3,400 m and operates with freight and passenger electrified railway featuring a design speed of 160 km/hr. The borehole-blasting method was used on the project. The construction work began in November 2007 and the tunnel was opened for operation in December 2014. The total investment in the project was 4.96 billion RMB. ■

## Renovation/Upgrading Project of the Year

### Vauxhall Station Upgrade Project, the UK



London Underground's (LU) Vauxhall Station upgrade is being carried out by Bechtel Ltd (main contractor) and was designed by Gall Zeidler Consultants, with tunnelling works performed by Joseph Gallagher Ltd. The project team changed the reference design to a complete SCL design to provide a more efficient construction programme and reduce ground movements. A more economical reinforced concrete collar was designed, rather than traditional steel lintel beams installed to support new openings in the existing platform tunnels with steel props. These eliminated health and safety risks associated with the installation of heavy steel framing and encroachment onto platform clearance. The project has successfully increased the existing station capacity without fundamentally altering the operational station. ■

## Tunnelling Project of the Year (from €50 to €500 million)

### Downtown Line Stage 3 Contract 937 - Construction of Fort Canning Station and Tunnels, Singapore



As Singapore's underground space becomes more congested with various competing needs - such as underground basements, utility tunnels and metro infrastructures - the construction of new underground metro lines has correspondingly become more challenging, complex and pushing the boundaries of engineering. This tunnelling project encountered many challenges, including cutter head interventions to remove foundations of buildings, close proximity to national monuments and in-service metro lines with only 1 m separation. The tunnelling at such close proximity to the 'live' tunnels, which carry hundreds of thousands of commuters daily, poses exceptional high risk. This project has since been successfully completed with no disruption to any community partners. ■

## Outstanding Project of the Year (up to €50 million)

### Chongqing Hongqihegou metro station, China



Chongqing Hongqihegou metro station is located in a bustling area of Chongqing, and under the main road to airport, where there are many buildings around. The concept of 'inner rocks' and 'inner rocks supporting' tunnelling method were put forward in the project. The whole tunnel section is divided into four drifts; two are on the top and the other two in the bottom to be excavated. In this way, they can be driven simultaneously. By using the inherent bearing capacity of 'inner rocks supporting', the horizontal and vertical temporary support of the tunnel is saved. Moreover, the 'time-space' effect is controlled precisely for the safety of the force transmitting between primary support and final lining. ■

## Technical Innovation of the year

### Large diameter shield tunnelling in pure sand with hybrid EPB shield technology, Brazil



The shield-driven tunnel of metro line 4 in Rio de Janeiro, Brazil, has an approximate length of 5.2 km. The excavation was performed using a hybrid earth pressure balance shield with an excavation diameter of 11.51 m, and passed through a complex geology that included a long stretch of pure sand bounded by two stretches of hard, highly abrasive rock. Considerable reduction in materials, for conditioning consumables, and energy of power consumption were achieved with this hybrid EPB technology. ■

## Safety Initiative of the Year

### ABSIS (Activity Based Safety Improvement System), Singapore



The Cable Tunnel project involves the construction of a 35-km-long tunnel, averaging 60 m deep to house the 400 kV and 230 kV transmission cable. ABSIS is introduced in this project as a systematic approach to address safety issues in various critical tunnelling activities; it is a platform where work activities are captured in a video. By viewing the video footage of themselves carrying out the works, the workers, without any language barriers, are able to see for witness the safety lapses they subject themselves to, as well as the good practices they achieve, but also can adopt. ■

## Innovative Use of Underground Space

### Jurong Rock Caverns, Singapore



The Jurong Rock Caverns (JRC) is located on Jurong Island and is Southeast Asia's first commercial underground facility for the storage of liquid hydrocarbons such as crude oil and condensate. Situated 150 m below the ground, it is able to optimise land use by saving up to 60 ha of aboveground land, ensuring safety and security of the products in storage whilst reinforcing Singapore's position as a leading energy and chemicals hub. With its successful completion, JTC and Singapore is well positioned to explore more innovative solutions to further promote Singapore's economic growth. ■



## Environmental Initiative of the Year

### The Emscher Project - Back to Nature!

The Emschergerossenschaft in Essen, Germany, is currently one of the largest environmental projects in the world, which involves the restructuring of a whole river system. This system has been used as an open wastewater transport system for more than 100 years due to extensive coal mining activities. After 2020 the whole river Emscher (with a total catchment of 865 sq km) will be transporting clean water again. To reach this target, it will be necessary to build a large 51-km-long underground sewer from Dortmund to Dinslaken, through a densely populated conurbation. Shafts will be built at up to 1,200 m intervals. In early 2012, the construction of the largest section of the Emscher interceptor was awarded to Wayss & Freytag ingenieurbau; the contract requires the construction of about 47 km of sewer tunnels. In addition, more than 100 construction pits have to be excavated, from which the tunnels will be driven by pipe jacking. In October 2015, the tunnelling work was successfully completed. ■

## Lifetime Achievement Award

### Dr Martin Herrenknecht



Dr Martin Herrenknecht received the Lifetime Achievement Award for his remarkable contributions in tunnelling. He graduated from the Konstanz University of Applied Sciences in 1964, and then founded his own company in 1975, Herrenknecht AG, which specialises in tunnel boring machines (TBMs). In 2010, Herrenknecht was recognised for drilling the largest tunnel in the world. Dr Herrenknecht also took part in the Eurasia Tunnel Project, which won an ITA Tunnelling Award in 2015, under the category of Major Project of the Year. ■

## Young Tunneller of the Year

### Derek Eng



Derek Eng studied civil engineering and was professionally trained in the field of tunnelling. He has also been vocationally called to empower young engineers and tunnellers using his hard-gained experiences and knowledge. He currently works as an assistant manager in the tunnel department at the Malaysia-based construction company, MMC Gamuda KVMRT (T) Sdn Bhd. Mr Eng's journey in his career has gone beyond just the technicalities of tunnelling, focusing a lot on providing professional training related to tunnelling and inspiring young school leavers to take up engineering as the career of choice. ■



# EXPANDING GREENS PORT

**W**atco Companies owns and operates Greens Port Industrial Park, which is located at the eastside of the Houston heavy industrial zone, along the Houston Ship Channel in Harris County, Texas, USA. The complex features deep-water barge docks along the channel with approximately 3 mil sq ft of indoor warehousing and numerous cranes ranging from 5 to 125 t capacity. This port, foreseeing the increase of the demand had to go for an extension of its facilities to expand its cargo handling capacity. A third and fourth berth had to be built.

## Piling solution

ESC Steel LLC, a subsidiary of ESC Group, was involved in the project. The company was awarded the supply of all of the steel pipes,

steel sheet piles, steel tieback system and bollards for the combi-wall. ESC said it offered a system that has been used extensively in various projects worldwide, including Antarctica. Working from its Houston office, the company not only performed the installation of sheet piles and combi-wall systems, but also assisted with the construction methodology.

ESC Steel proposed a combi-wall system utilising steel pipe piles with cold rolled Z steel sheet pile infills, coupled with galvanised threaded tie backs connecting the main front wall to an anchor wall. The anchor wall was composed of steel H-piles with cold rolled Z steel sheet pile infills. The walings and connection items for the complete system including the bolts were included in the ESC scope, as well as the design and supply of the bollards.



Above: The Greens Port Industrial Park in Texas has recently undergone an expansion to increase its cargo handling capacity.

ESC Group is headquartered in Hong Kong, with offices and representatives located around the world. The company started back in the early 1980s as a sheet pile installer and manufacturer, using its own designed profiles. Its first sheet pile was driven on the Magnetic Island at the Great Barrier Reef, Australia. Throughout the years, ESC has played a role in a variety of projects around the world, making it one of the leaders in piling solutions. The company can also provide engineering design supports for different steel structural components used in multiple applications. ■

Website: [www.escpile.com](http://www.escpile.com)



Left, below and bottom: ESC Steel was involved in the project, supplying all of the steel pipes, steel sheet piles, steel tieback system and bollards for the combi-wall.



# SMART PAVING



Above: Swank Construction is working on mainline paving projects around the Pittsburgh area of Pennsylvania.

Left: The company is being aided by a Gomaco GP3 paver equipped with Trimble Navigation 3D guidance system.



Swank Construction Company is currently working at the intersection of Interstate 376 and the McClaren Road, Exit 4, in Pittsburgh, Pennsylvania, USA. The company has been tasked to reconstruct 8 km of both the eastbound and westbound lanes of the interstate, which is the main access road to Pittsburgh International Airport. The new three-lane roadway will be completed in different paving widths ranging from a 4.6 m wide shoulder, to a 6.7 m wide pass which includes a 3.7 m driving lane with 3 m shoulder.

For the project, Swank Construction decided to use a Gomaco GP3 paver. The company has also purchased an IDBI attachment to insert transverse joint bars in the new pavement on-the-go. The GP3 with IDBI will be paving 7.3 m wide. All of the pavement is 279 mm thick.

The GP3 has been equipped with a Trimble Navigation 3D machine guidance system eliminating stringline from the project. In fact, the whole project is being constructed using the Trimble system, from milling to grade preparation to final concrete paving.

During construction, traffic flow must be maintained on the major artery into the city. Swank Construction began work on the westbound lanes of Interstate 376 last year (2016). As traffic continues to flow on two existing lanes of the interstate, the company has removed and is replacing the existing inside shoulder, the first phase of the project. The new roadway is being built to last from the ground up.

“There’s 610 mm of stone with a 102 mm asphalt permeable base

placed over the rock,” said Lou Schultheis, construction manager for Swank Construction. “We put 279 mm of concrete on top of that, three lanes wide for 8 km east and 8 km west.”

Concrete for the project is a Pennsylvania Department of Transportation (PennDOT) double A mix with a slump averaging 51 mm. Swank’s batch plant is located about 12 minutes away and concrete is delivered in tri-axle dump trucks, each carrying a 9.2 cu m load. The concrete is dumped directly onto grade in front of the GP3 slipform paver.

The Gomaco GP3 is equipped with a 5400 series paving mould featuring a 1,372 mm finishing length from front to back, edge slump adjustment, and a self-supported transition adjuster (TA). The 5400 series mould also has hydraulic vertical hinged sideplates that are self-contained inside the mould for track clearance.

“We decided on the GP3 because of the stringless and the paver just seems more advanced, more manoeuvrable. This job has a lot of tight applications and tight quarters,” said Pete Douglas, superintendent for Swank Construction. “For this first phase, we only have about 0.8 m from existing edge of old concrete to new concrete. We need just enough room for the track to fit. The pivoting legs and the GP3 come in handy.”

Trimble’s PCS900 paving control system uses total stations, sensors on the paver, and their software to guide the GP3. The 3D model of the construction site is prepared using their Business

Centre - HCE software. It has a virtual 'drive through' feature allowing contractors to address any potential issues with the model before concrete paving begins. Swank uses three to four total stations to control the alignment of the paver during slipforming with precise millimetre control of the mould. When it is time to switch from one total station to the next, the system will automatically and instantly transition to the next total station. The feature is called a 'hot swap' and there is no need to stop the paver. The same tolerance between total stations is automatically maintained for a smooth transition from one point to the next.

PennDOT uses the International Roughness Index (IRI) as its standard for pavement rideability. The specification requires an IRI of 70 or below. Anything over 70 requires corrective action. The GP3 is equipped with mould-mounted GSI (Gomaco Smoothness Indicator) units constantly measuring and reporting the smoothness of the new pavement.

Swank Construction can monitor its GSI readings, along with Trimble 3D and G+ information all from ground displays located within eye level of personnel. The G+ features a remote operator's screen with the same graphical display as the operator's station. It is called G+ Ground Control and allows ground personnel to see everything on the screen that the operator does on top of the paver. Ground Control also gives them the ability to fine tune the paver and make settings adjustments.

"Typically we have the three boxes on the side of the paver," explained Mr Douglas. "We have the box that's basically the reflected image of what the operator sees, which we have some control on that. Then, we have the Trimble box which is all run from the ground, trading guns on and off, and then we have the GSI box for the ride spec."

Portions of the 4.6 m wide shoulder with four percent cross slope are scabbed onto the existing two lane roadway. Even for the scab-on work, Swank Construction is remaining stringless. G+ controls allow the added versatility with various sensing capabilities.

A Gomaco T/C-600 texture/cure machine follows the GP3 applying a longitudinal tine and white spray cure. Wheels attached to the sensors on the texture/cure machine allow steering to be referenced off the side of the new slab and grade control to be referenced off the top for this stringless project.

The new concrete slipformers are quickly becoming experienced veterans as they continue the shoulder work on the project and progress to the driving lanes and



Top: The Gomaco T/C-600 texture/cure machine applies a white spray cure and longitudinal tine finish to the new Interstate 376.

Above: The T/C-600 machine has wheels attached to the sensors to steer it on the stringless project. Steering is referenced off the side and grade control is referenced off the top of the new concrete roadway.

eventually outfit their GP3 with the IDBI attachment. The GP3 and its versatility has proven itself already in the tight project conditions. Its transportability has also been a major factor.

"One of the big problems with this project is it's so broken up and all over the

Above: The GSI smoothness readings can be viewed on the GSI display (right monitor), as well as on the new G+ Ground Control display screen (left monitor).

Inset: The G+ Ground Control is a remote operator's screen, which can be positioned anywhere on the paver and allows the ground crew to see the same image that's on the G+ controls at the operator's station.

place," said Mr Douglas. "We have actually spun the paver, walked it up on a lowboy with the mould under it, moved it, and poured the same day with it because there's really no set up. Spin it, set it, set your guns, and away you go." ■

Website: [www.gomaco.com](http://www.gomaco.com)



The Champlain Bridge in Montreal, Canada, is over 50 years old and will be replaced by a new structure.

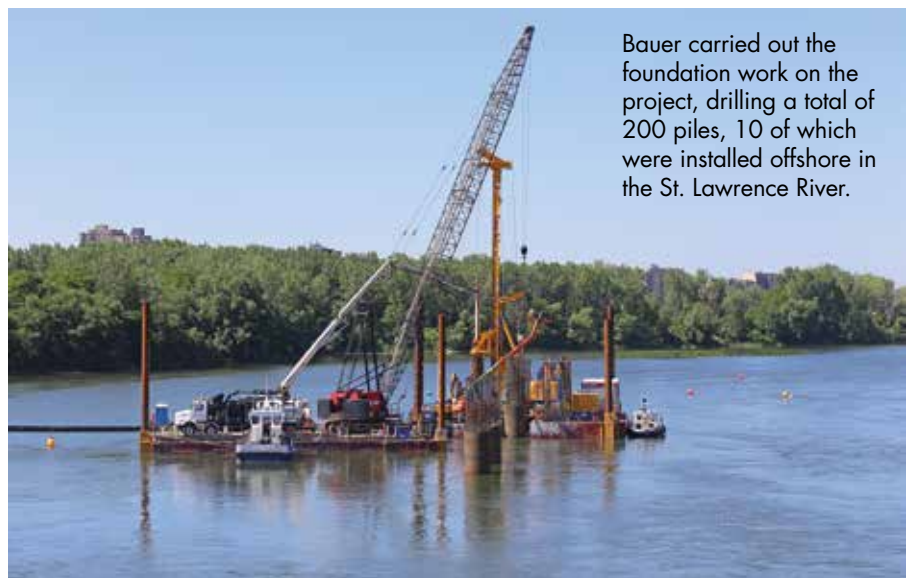
# MONTREAL CONNECTION

The Champlain Bridge in Montreal, Canada, is over 50 years old, and one of the most frequently crossed bridges in North America with up to 50 million vehicle crossings per year. Due to the extensive wear and prolonged road salt exposure over the years, a replacement of the bridge is now required. The 3.4-km-long new Champlain Bridge across the St. Lawrence River is estimated to cost C\$4 billion and is thus among the largest infrastructure projects under construction in eastern Canada.

## Foundation work

Bauer secured a contract to carry out the foundation work for the two main structures – new Champlain Bridge and Nun’s Island Bridge between Montreal and Nun’s Island.

Since October 2015, Bauer has installed a total of 200 concrete piles with diameters of 1,300 and 2,000 mm, 10 of which were offshore in the St. Lawrence River – just one of the many technical and logistical challenges faced by the company. The ground conditions consisted of loose to very dense sand with occasional boulders, with pieces of rock, clay shale, bedrock and calcareous shale with a hardness of over 120 MPa.



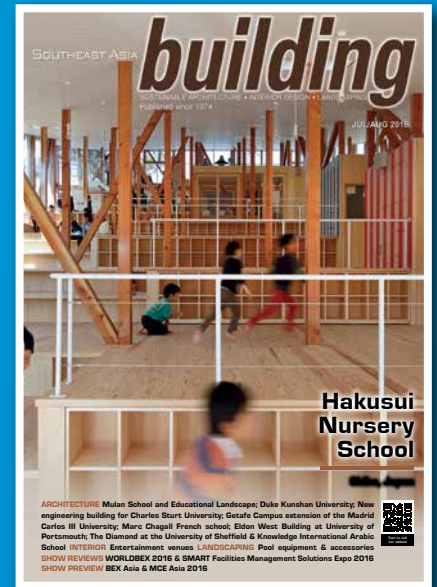
Bauer carried out the foundation work on the project, drilling a total of 200 piles, 10 of which were installed offshore in the St. Lawrence River.

Two Bauer drilling rigs, a BG 28 and a BG 39, were used for installing the piles with depths of up to 26 m; the offshore drilling was carried out from barges. Additional concrete pumps were used to bridge the long distance from the shore to the pile location in the middle of the river. Part of the piles were drilled in the winter season, so special measures had to be implemented to allow working in temperatures as low as

-25 degrees centigrade. In July 2016, Bauer finished the work on schedule.

With its impressive stay cable design, the six-lane new Champlain Bridge will also have separate pedestrian and bicycle lanes. It is designed for a useful life of 125 years and is expected to carry up to 60 million vehicles per year. The opening is planned for 2018. ■

Website: [www.bauer.de](http://www.bauer.de)



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# Stepping into **'THE FUTURE'**



Conexpo/Con-Agg is getting ready for the next edition, to be held at the Las Vegas Convention Centre in Las Vegas, Nevada, USA, from 7 to 11 March 2017. It will be co-located with the IFPE exhibition for fluid power, power transmission and motion control. The events are produced by the Association of Equipment Manufacturers (AEM), which also is a show owner.

In October 2016, the triennial Conexpo/Con-Agg earned the top spot on Trade Show Executive's prestigious Gold 100 trade show

ranking as the largest show in the US of any industry in 2014 with more than 2.35 mil net sq ft of exhibit space (and more than 2,100 exhibitors and more than 129,000 visitors).

In 2017, Conexpo/Con-Agg is planned to have a record 2,500,000-plus net sq ft of exhibits with the theme 'Imagine What's Next'. This reflects the show's vision as it fully embraces applied technologies that help the construction industry reduce downtime, maximise efficiency at job sites and minimise waste while increasing bottom line profits and enhancing safety.

"Technology is critical to the future of the construction industry and Conexpo/Con-Agg has always been a show that helps industry executives keep pace with the latest in new equipment and product innovations," said Rich Goldsburly, Conexpo/Con-Agg 2017 show chairman and president of Bobcat Company and Doosan. "But, as industry is being transformed by technology, our attendees understand the importance it has on their bottom line. It is our responsibility and privilege to connect them with the most cutting edge innovations in safety, equipment and operations that are reshaping the future."

A recent snapshot survey from AEM found that nearly half (45.9 percent) of previous Conexpo/Con-Agg visitors responding were enthusiastic and optimistic about the new possibilities when asked what the construction industry will look like in 2025, and nearly one-third (32 percent) were interested in what will come but apprehensive about how to successfully get there.



### Tech Experience

In line with the show's theme 'Imagine What's Next', Conexpo/Con-Agg 2017 will feature a new 75,000 sq ft Tech Experience pavilion, dedicated entirely to presenting emerging construction innovations that are driving change and process improvement across the industry. Emerging technologies for the jobsite of the future, innovative wearables to enhance health, safety and productivity, cutting-edge skills for careers of the future, and new materials to enhance infrastructure, are some of the things visitors might experience as they step into the future of the construction industry.

"The Tech Experience will not only present a vision for the future of our industry, but it will also raise awareness of technologies that enhance safety, productivity and profitability. Attendees will explore three key zones: the worksite of the future, the jobs of the future and the infrastructure of the future," explained Sara Truesdale Mooney, show director and vice president exhibitions and business development for AEM. "We'll also feature additional engagement zones including a Maker Beta Lab that will feature a collaborative future factory environment and the world's first fully functional 3D-printed excavator."

Conexpo/Con-Agg and IFPE 2017 are teaming up to unveil the world's first fully-functional 3D printed construction excavator and the first large-scale use of steel in 3D printing, known as additive manufacturing. Visitors will be able to see a demonstration of the 3D printing technology on the show floor.

The excavator is a joint collaboration between AEM, the National Fluid Power Association (NFPA), Centre for Compact and Efficient Fluid Power (CCEFP), Oak Ridge National Laboratory (ORNL) and National Science Foundation (NSF). The group is working with research teams from Georgia Tech and the University of Minnesota to convert the current excavator design to one that is conducive to and takes full advantage of 3D manufacturing. Graduate engineering students at Georgia Tech will be creating a boom and bucket featuring integrated hydraulics with the goal of decreasing the weight, materials cost and maintenance, while students at the University of Minnesota are designing a hydraulic oil reservoir/heat exchanger and cooling system that reduces the size and weight and increase the efficiency of the machine.

"Technology and innovation will drive change for the future of the construction industry, and we're excited that students are playing a vital role in bringing the newly designed machine to life," said Eric Lanke, chief executive officer of NFPA.

In addition, a student engineering team from the University of

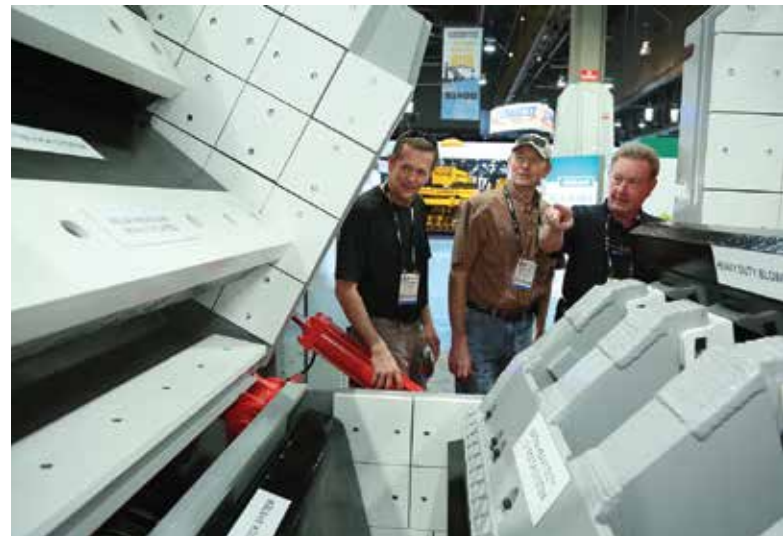


Illinois at Urbana-Champaign (UIUC) has submitted the winning design for an aesthetic and functional excavator cab that will also be 3D printed and on display at the Tech Experience pavilion.

Student engineering teams from across the US participated in the cab design contest, which sought for a futuristic excavator cab and human machine interface. A panel of industry experts judged the competition; members of the UIUC team will receive a US\$2,000 cash prize, donated by NFPA, and will have the opportunity to travel to ORNL in Tennessee to observe the printing of their design.

"This project was one of the very top efforts in an extremely competitive field of 28 senior design capstone projects within the MechSE Department at UIUC in the Spring 2016 semester," said professor Elizabeth Hsiao-Weckler, associate head for undergraduate programmes in the Department of Mechanical Science and Engineering. "It had the ideal combination of a challenging project with outstanding ingenuity and hard work by the student team. We think it was a perfect example of what's being accomplished within our senior design capstone programme's innovative atmosphere."

AEM, NFPA, ORNL and NSF partnered with CCEFP to sponsor the nationwide cab design contest. "Additive manufacturing will revolutionise the way things are designed and produced in the not-so-distant future," said Mike Gust, industrial liaison officer at CCEFP. "This contest helped to raise awareness of advancements in technology to the next generation of engineers and we're excited that future engineers are bringing this newly designed machine to life."



**Education**

Conexpo/Con-Agg 2017 will also offer a record 143 education sessions across 10 tracks, including a new Technology track, to provide visitors with the latest industry knowledge and best practices to improve their professional skills and company productivity.

The new Technology track looks at industry innovations and future growth opportunities in the technology field, such as drones, autonomous machines, 3D imaging, smart apps, gamification, big data and IoT. This session will complement the new Tech Experience showcasing the ideas and technologies that will transform construction in the future.

The education tracks will also offer the latest trends and best practices focusing on: aggregates; asphalt; concrete; cranes, rigging and aerial lifts; earthmoving and site development; equipment management and maintenance; management: business best practices; management: workforce development skills; and safety and regulations.

**New layout**

Conexpo/Con-Agg 2017 will feature a streamlined show layout, designed to create a better synergy between outdoor and indoor space product areas and make it easier for visitors.

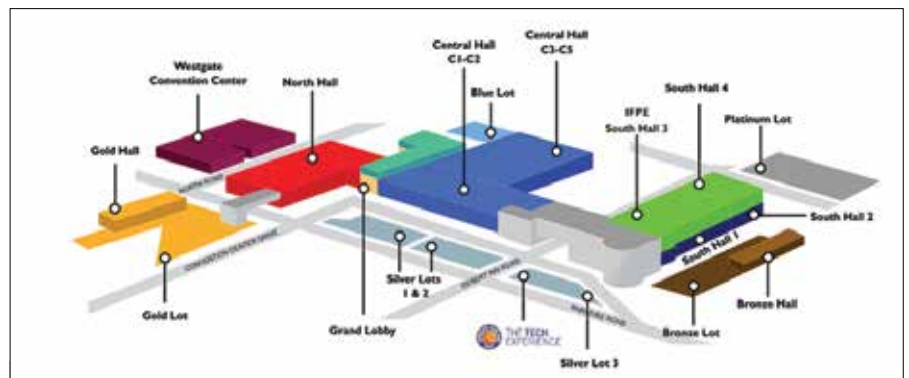
As part of the new layout:

- The Gold Lot includes an expanded Gold Hall and now extends to Las Vegas Boulevard,

using the site of the demolished Riviera Hotel

- A new Bronze lot (with Bronze Hall) has been added south of South Hall, extending the length of the building
- Both lots will feature Registration areas as well as registration in the Westgate Convention Centre (formerly Las Vegas Hilton) adjacent to North Hall. ■

Website: [www.conexpoconagg.com](http://www.conexpoconagg.com)



Above: Conexpo/Con-Agg and IFPE 2017 floor plan.

All photos: Scenes from Conexpo/Con-Agg 2014.

## LIUGONG

**BOOTH: G3322**

LiuGong will introduce its new innovation, the Vertical Lift (VL) wheel loader. Highlights of the machine include the vertical lift loader arms on an articulating frame and the mechanical self-levelling Z-bar bucket linkage on a vertical lift loader – both are industry's firsts, said LiuGong.

The vertical lift offers an innovative way to increase customer value when purchasing a loader. It accentuates the wheel loader's primary function: lifting and carrying a load, by providing a heavier tipping load and a higher lift height than conventional wheel loaders of the same power and weight.

Fuel costs are greatly reduced since the reduced operating weight of the vertical lift machine allows more tons material to be moved per horsepower than with a conventional radial lift machine. This allows customers to move more tons per hour for lower initial investment, and lower owning and operating costs than would be required with conventional technology.

The machine is ideal for stockpiling and truck loading applications with advantages in efficiency and performance. Since the vertical lift wheel loader shares its basic technology with all other LiuGong wheel loaders, the reliability and durability of the vertical lift machines equals what customers



The new LiuGong Vertical Lift wheel loader.

have come to associate with other LiuGong wheel loaders.

According to LiuGong, the idea of vertical lift loader technology was first generated in 2010 and then started and

further developed in 2011. After four years of development, the company expanded the team and went into final development stage in 2015. The new machine is expected to be ready for mass production in 2017. ■

## BROKK

**BOOTH: B90703**

The new Brokk 110 demolition robot is equipped with the Brokk SmartPower electrical system. This intelligent system optimises the performance of the machine based on factors such as the quality of the power supply, the environment and more. In addition, the system is designed from scratch for the extreme work environments of Brokk machines, resulting in excellent reliability and serviceability.

The Brokk SmartPower makes it possible to run the machine on lower quality power supply and also provides increased availability of the machine over its entire lifetime. The Brokk 110 operates on both 16 and 32 amp fuses, and features a 360 degrees work radius, enabled by its low design.

According to Brokk, this new model delivers 15 percent more power than the popular Brokk 100 and a whopping 50 percent more power than the iconic Brokk 90. At the same time, it retains the compact format of the Brokk 100, making it highly versatile in restricted spaces. It folds up into a compact package that can easily climb stairs or fit into an elevator. And with a weight below 1,000 kg, it is suitable for use on weak floor loads.

What's more, the Brokk 110 is built for tough environments, fitted with fully covered and protected components. For example, the machine has new headlight protections for its LED headlights, and there is additional protection in the paint choice allowing its new roughened grey colour to add an extra level of resistance to scratches that makes it last longer. ■



Right: The new Brokk 110 demolition robot.

# GOLDHOFER

**BOOTH: G4416**

Goldhofer's six-axle ADDrive is highly versatile and suitable for a wide range of applications. This switchable drive optimises working with heavy-duty modules, whether they are operated as towed modules or as self-propelled modular transporters.

Highlights of the system include efficient vehicle mobilisation as well as fast and easy reduction of the overall weight, for example when bridges have to be crossed. In such cases the tractor is simply disconnected and ADDrive switched to the self-propelled mode. This prevents the need to unload the cargo onto a separate self-propelled module. In addition to solving problems with weight limits on bridges, this solution is equally applicable to tricky situations involving tight bends, serpentine roads and roundabouts.

The ADDrive features a free-wheeling mode: as soon as a certain speed has been reached, the system disconnects automatically from the drive and functions as a normal heavy-duty module for towing at speeds of up to 80 km/hr. With the drive axle uncoupled from the motor, there is no more oil flow. This means there will be no overheating of the drive, and with the related sources of wear and resistance eliminated, it significantly reduces maintenance.

Another advantage is that if a hill climb calls for a short-term increase in available power, ADDrive is simply reactivated by pressing a button. In some cases this avoids the need to have a second tractor. For safety,



Above:  
Goldhofer  
STZ-P 9  
semitrailer.

Left:  
ADDrive in  
operation.

ADDrive is also fitted with a quick-acting electronic braking system (EBS).

In addition, Goldhofer's STZ-P low loader semitrailer is designed with swing-axle technology, maximum frame strength and extendible decks, plus a choice of vehicle

widths and various wheelbases. The STZ-P 9 (3+3+3) AA is also extendible between the bogies to comply with US regulations on axle spacing. The rear bogie can be retracted under load for greater flexibility when facing tight bends and roundabouts. ■

# ANMOPYC

**BOOTH: GL12287**

ANMOPYC, the Spanish Manufacturers Association of Construction, Public Works and Mining Equipment, will be joining Conexpo 2017 to represent its member companies. The association was founded in 1982 as the sole representative of the construction sector in Spain. Its main aim is promoting exports of its members worldwide, to give them encouragement for manufacturing of safe machines and equipment, and strengthen R&D activities in the construction sector.

ANMOPYC represents the most important Spanish manufacturers of machinery, components and auxiliary equipment for construction, public works and mining. Products manufactured by its members can be classified into the following categories: road equipment; concrete; construction lifting, transport and handling equipment; quarries, mining and recycling; earthmoving; temporary works equipment; and auxiliary equipment for construction.

ANMOPYC is currently made up of about 100 companies all over Spain. Some of them will also be participating at the show (see the tables on the right). ■

Conexpo	Booth
Ausa	G2331
Bezares	S82810
Blumaq	C22430
Cintasa	B90819
Linden Comansa	G2789
Etesa	G71921
Jaso	G1926
MTG	C21004
Nuñez	B90614
TGB Group	G73324
THSA	B90818

IFPE	Booth
Dicsa	S83740
Ikusi	S83709
Roquet	S81306
Trazione	S83746

## VOLVO

**BOOTH: N10036 & G3894**

Among the highlights at the Volvo booth is the A60H, which is believed to be the world's largest articulated hauler; the EC750E, the latest and largest excavator available from Volvo in North America; new wheel loaders; and the HX02, a concept battery-electric, fully autonomous load carrier, making its first public appearance. Volvo will also showcase a gold-painted A40G articulated hauler to conclude its year-long celebration of the 50th anniversary of the articulated hauler.

In addition, a range of new technologies and services will be unveiled, the most notable of which are ActiveCare Direct and Dig Assist. Volvo Dig Assist allows the excavator operator to set job parameters, such as target depth and grade; conduct in-field design, and view job progress in real time, ensuring the work meets exact specifications. Dig Assist is the latest addition to the suite of Assist programmes - which also includes Compact Assist and Load Assist - providing real-time intelligence to the operator in terms that are easy to understand and directly tied to job quality.

Visitors will have an opportunity to interact with the Assist programmes on the Volvo Co-Pilot interface - a scalable, Android-powered tablet computer. They



The gold-painted Volvo A40G articulated hauler.

will also get a glimpse of future Assist Co-Pilot programmes to be rolled out for soil compactor and articulated haulers.

The ActiveCare Direct is a telematics monitoring service offered at the OEM level and supported through Volvo's dealer network. Volvo has built an uptime centre

with an experienced team of analysts capable of proactively monitoring and reporting on customer fleets throughout the US and Canada. The service relieves the burden of sorting through vast quantities of available data and delivers thoughtful analysis and practical recommendations to the customer. ■

## ALLEN

**BOOTH: B7213**

The new HDX760 from Allen Engineering Corporation is a hydraulically controlled ride-on power trowel that incorporates 'Intelli-Power' to ensure peak performance, component safety and extended life.

The built-in Intelli-Power system controls both the hydraulics and the engine operation, allowing the 74 hp T4F Hatz diesel engine and the Bosch-Rexroth hydraulic components to 'talk' to each other, ensuring maximum performance and safety at all times. This also results in a much longer operating life expectancy.

The Intelli-Power system is a combination of the Bosch-Rexroth hydraulic control unit (HCU) and the Hatz engine control unit (ECU). The HCU communicates with all of the pumps, motors and valves to ensure maximum performance and safety. It also monitors the hydraulic filter to warn when the filter is clogged, and monitors the

hydraulic temperatures to prevent component damage. The ECU works with the HCU to maintain maximum efficiency and precise rotor speed. It is able to sense the engine load and adjust the rpms to prevent the engine from bogging down, and all the while keeping effective rotor speeds on the concrete.

Other features of the HDX760 include twin, 57.6-in rotors with six bladed spiders; rotor speeds of up to 145 rpm; and two point, top-mount lifting system. ■



Allen's new HDX760 riding trowel.

## LINDEN COMANSA

**BOOTH: G2789**

The LCL 310 luffing-jib tower crane from Linden Comansa comes in three versions: 12, 18 and 24 t. Its maximum jib length is 60 m, allowing different jib configurations for maximum reaches every 5 m. The crane features a compact design and reduced out-of-service position, ideal for use in cities or congested job sites.

According to Linden Comansa, large flat-top tower cranes are traditionally popular in North America, and also the company's most successful product line in the region. Therefore, the 21LC335 and 21LC550 models will be highlighted during the show, as they have been recently upgraded and optimised to load up to 20 and 25 t respectively. The 21LC450 crane, with a maximum load capacity of 25 t, is another recently developed flat-top model with a good reception in the North American market, said the company.

The 3000 Series of flat-top tower cranes consists of two models with heavy maximum loads, from 32 to 90 t. These cranes are intended for the industrial and infrastructure construction market around the world. The LC1600 Series features an integrated tower top and counter-jib into one component, with maximum loads from 8 to 12 t.

In addition, the LCL700 is the largest luffing-jib crane in the Linden Comansa line-up, which is also targeted at the North American market. Although it will not be on display, the crane will be officially launched just a few weeks before Conexpo, said Linden Comansa. It will offer 50 and 64 t versions. ■



Right: Linden Comansa's LCL 310 luffing-jib tower crane.

## CARMIX

**BOOTH: B7426**

The Carmix 3500 TC self-loading concrete mixer from Metalgalante is suitable for the rental industry as it is designed to produce high-quality concrete at a low cost on any jobsite. The machine's Concrete Mate electronic dosing system allows easy and intuitive creation and management of up to 20 mix designs with 99 different components, taking into account the moisture content of the materials involved.

Another highlight is the Promix system, a stainless steel probe inside the drum with power supplied by a solar panel. The probe provides details on the concrete parameters such as slump, temperature, humidity and rotational speed of the drum; it also lets the operator know when the batch is ready. All the data is displayed in the cab and constantly updated. The information can be stored in an external computer or sent to other mobile devices via the GPS network.

In recent years, Metalgalante has continuously strengthened its presence in South America. And thanks to an agreement with Caterpillar, where Carmix is now one of the strengths of the Cat Rental Store, the company has also expanded into Central America. In addition, Metalgalante intends to develop its activities in North America, especially in Canada and the US. ■

Carmix 3500 TC self-loading concrete mixer.



# LINK-BELT

**BOOTH: G3864**

Link-Belt has expanded its top-end of telecrawler fleets with the new TCC-2500, equipped with a main boom of 68 m. This 227 t (250 USt) crane is ideal for any general construction, power transmission, wind farm, power industrial or large crane rental fleet.

The TCC-2500's job site flexibility is a huge benefit. It can lift, reach and travel like a large fixed boom lattice crawler, while also having the ability to retract the boom and reduce its overall profile as job site conditions and environment require.

The seven-section 13.8 – 67.9 m pin and latch boom offers eight simple boom extend modes. The attachments feature a three-piece offsettable fly that measures 3.6 m, 12.1 m and 20.4 m and can also be equipped with two 7.62 m boom extensions for an overall tip height of 105.46 m. These attachments with optional hydraulic luffing allow for 'up-and-over' capacity like luffing lattice crawlers.

Another key feature of the TCC-2500 is an extra wide winch design that can handle its maximum permissible line pull through the fourth layer – front and rear winches are matching. The rear auxiliary winch can be removed for transport weight reduction and a power pinning system mitigates work at height exposure. The crane's maximum line pull is 12,957 kg and maximum line speed is 123.4 m/min.

The TCC-2500 is fitted with a 20 degree tilting cab and a new 25.4 cm full colour display that incorporates both RCL and engine data. The display has been carefully selected to have a resistive touch screen that can be used with gloves and be seen in direct sunlight with larger, clearer images on display. Electric cab controls come with unparalleled functionality and increased customisation and ergonomics. Operator job site view is enhanced with four cameras: rear-view, blind-side swing-view, and two individual winch-view cameras that provide increased job site awareness and control of the job site from inside the cab.

The crane's track gauge is 6,210 mm. The lower carbody is a hook and pin system, which will make assembly quick and easy. The TCC-2500 can self-assemble side frames with standard equipped car body jacks and wireless remote control for hydraulic pinning and jack operation. Customers will utilise new two-bar grouser track shoes that provide excellent traction with standard nylatron pad inserts to protect sensitive ground surfaces when needed.



Top and above: The new Link-Belt TCC-2500 telescopic crawler crane.

The TCC-2500 can move quickly and easily on or off the job site. The main transport load weighs under 48,000 kg. The crane can be assembled with far fewer and less complicated steps than the competition, said Link-Belt. Once off a trailer, carbody jacks can be deployed via remote control.

Link-Belt's TCC counterweight system attaches 69,853 kg of upper counterweight and is a nine-piece modular design (allowing for partial counterweight capacity charts) and transports on seven overflow loads, all 19,958 kg or less.

Other highlights of the TCC-2500

include: standard, water tight tool box mounted to front carbody counterweight; telematics in place to give real time data to better forecast maintenance and service needs of the crane; in-cab ground bearing calculation; selectable joystick travel mode; and optional hydraulic off-settable fly (2 – 45 degrees).

At the Conexpo 2017, Link-Belt will showcase the TCC-2500 with its Tier 4 Final Cummins QSL 9 diesel engine and seven-section formed boom. Production units of the TCC-2500 are expected to be ready for shipment in March 2017. ■

# AMMANN

**BOOTH: S5464**

One of Ammann's innovative asphalt plants is the ABA UniBatch, which will be assembled at the booth to allow visitors a close-up view of the unit. It utilises high percentages of recycled asphalt (RAP) and includes a noise reduction system, fumes extraction system, energy-saving software that further reduces emissions, and full cladding that lessens dust and provides aesthetic appeal.

Another Ammann plant, the ACM 100 Prime, is designed for asphalt manufacturers who have a number of small jobs in different locations and require frequent transport. The plant is productive, easy to install and a great recycler.

Ammann's light compaction equipment will also be on display. The machines offer a multitude of features, such as intuitive operation and vibration-limiting handles that make them productive, safe and comfortable. These machines are user friendly as well, so operators of all experience levels can operate them easily.

In addition, Ammann's heavy compaction equipment – including single drum, tandem and pneumatic rollers – are known for their intuitive control, excellent visibility, operator comfort, high compaction output and easy access to service points.

The proprietary Ammann Intelligent Compaction systems, ACE<sup>force</sup> and ACE<sup>pro</sup>, are available on many Ammann rollers. The systems help eliminate unnecessary passes and the costs that go with them. The ACE systems deliver quality control by identifying uncompacted spots. ACE<sup>pro</sup> can even react and automatically adjust the vibration parameters. All measured values can be displayed and evaluated, which include load-bearing capacity of material, number of passes and frequency/amplitude values.

Among the rollers to be showcased is the ASC 110 Tier 3 soil compactor, a machine known for its 'no-rear-axle' concept that enables stability and traction. ACE<sup>force</sup> and ACE<sup>pro</sup> are options on this compactor.

The ARP 95 K Tier 4i pivot-steer roller offers split drums and ACE<sup>force</sup> and ACE<sup>pro</sup> as options. The ARX 90 Tier 4f articulated tandem roller features an articulated joint with oscillation for increased coverage and quality. It is available with ACE<sup>force</sup>. The ARX 26 tandem roller is lighter and works well in tight spaces and against curbs. It also has ACE<sup>force</sup> capability.

The AP 240 Tier 3 pneumatic tyred roller adjusts easily to various applications



Above: ASC 110 soil compactor.

Left: AFP 185 vibratory plate.

Below: ACM 100 Prime asphalt plant.



due to its innovative ballasting system and air-on-the-run system for easy control of tyre pressure. The ARR 1575 Tier 4f roller offers

high compaction output and drum extension kits that can make the machines even more productive. ■

# TEREX TRUCKS

**BOOTH: G3987**

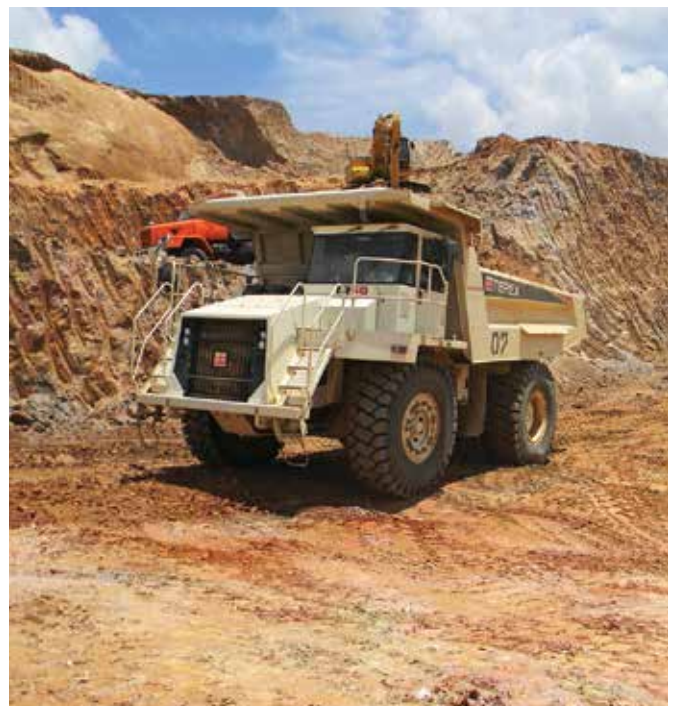
Terex Trucks' new Generation 10 range of articulated dump trucks - TA250, TA300 and TA400 - offer durability, quality and also herald the introduction of telematics. The machines feature an improved operator environment for maximum comfort and efficiency, even in rough terrains.

The Gen 10 TA400, the largest in Terex Trucks' articulated hauler family, will be in the spotlight at the show. Available in Tier-2, EU Stage 2, EU Stage 4 and Tier-4 Final emissions legislation compliant engine configurations, the articulated hauler is designed to deliver low operating costs and superior performance. In an effort to maximise uptime of the dump truck, additional investments have been made to protect the machine's components - including upgraded hydraulic and electrical interfaces, new drop box and improved aesthetics.

To ensure productivity in all haul conditions, the Gen 10 TA400's engine and drivetrain have been optimally matched, utilising

automatic adaptive shifting and a pre-selected two-speed transfer box (drop box). Furthermore, cushioned stops on the steering cylinders have been integrated to afford operators with a more comfortable ride, and the cab also features an enhanced air conditioning and ventilation system.

From the rigid dump truck range, the versatile TR60 model has been purpose-built to haul through tough environments and carry more materials in less time, with less fuss. Having a payload capacity of 60 t, the machine is powered by a Cummins six cylinder 19-l engine. Its drivetrain gear reduction provides excellent rimpull, powering the rigid hauler up the steepest of gradients, while a high capacity haul body makes for low retention carry-back and cleaner dumping. A popular model, the TR60 offers solid performance in a wide range of hauling applications - from mining sites to large construction and earthmoving projects. ■



Top and above: Terex Trucks Gen 10 articulated dump trucks.

Top and above: Terex Trucks TR60 rigid dump truck.

# MAKINEX

**BOOTH: S61239 & S62348**

Australian company Makinex Construction Products offers a wide range of solutions. Among them is the PHT-140 powered hand truck, an efficient material handling solution that enables one person operation to safely lift and load small equipment or bulky goods weighing up to 140 kg. It provides a quick and easy alternative to using a forklift or tailgate loader for small loads. For many tradespeople and contractors, this means the elimination of awkward and dangerous one or two person lifts as well as significantly reduced risk of back injury, which ultimately leads to decreased lost time injury.

The PHT-140 has many applications and can be used in workshops, warehouses, depots, distribution companies and hire and rental yards. The operator can lift and load directly into vehicles (trucks, vans and cars) or to place equipment and small loads on bench tops. The PHT-140 is both lightweight and easy to manoeuvre, and can be folded down for easy transport and storage, which is essential for high traffic work areas.

The Makinex Hose 2 Go is a self-pressurised water source for dust suppression and more. The unit is ideal for the hire and rental industry as a dust suppression tool and portable water supply. The Hose 2 Go has a constant flow of water that allows users to suppress the dust when cutting, core drilling and grinding concrete. It provides a constant water flow without the use of a pump, battery or electronics.

The Makinex DPW-4000 dual pressure washer not only makes cleaning surfaces much quicker, but also saves costs as it features two tools in one. The rotary cleaner that is trolley operated can easily glide over surfaces such as concrete, sports grounds, decks and paved areas. The other feature is the wand pressure washer, which is used for walls, fences and difficult to reach areas.

The Makinex Jackhammer Trolley (JHT) is a demolition tool for the removal of floor tiles, adhesive residue, vinyl and cork from concrete and wooden surfaces. In March 2013, Makinex released a new and improved design of the product, reconfiguring the frame so the handle bar position is higher for better ergonomics.

The JHT can also be fitted with optional attachments, such as a wide chisel and tile smasher available for specific applications. The trolley itself carries the majority of the weight of the jackhammer, relieving the pressure and strain from the operator. As a result, operator fatigue and injury is considerably reduced. With built-in shock absorbers, the JHT also cuts down on the vibration impact, making it more comfortable.

The Makinex MS-100 mixing station makes mixing and applying floor levelling compounds easy and quick. The unit can mix a 26-gallon batch of levelling cement consistently, allowing contractors to take on jobs up to 5,000 sq ft without the need for a pump, according to Makinex. For larger jobs up to 20,000 sq ft, multiple mixing stations can be used.

With a built-in timer, the MS-100 can mix up to 100 kg hands-free in only three minutes, freeing up contractors to prepare surfaces and undertake other tasks while mixing, said Makinex. The portable and lightweight MS-100 mixes self-levelling cements, compounds and epoxies quickly, and then easily tilts to give control, speed and precision when pouring. ■



Top right: Hose 2 Go self-pressurised water source.

Right: PHT-140 powered hand truck.

# GENIE

**BOOTH: G3382**

The first model in the new Genie Xtra Capacity (XC) stick boom family, the Genie SX-135XC self-propelled telescopic boom lift, has a maximum working height of 43.15 m. According to Genie, the unit offers 3 m more outreach (27.43 m) and 32 percent more capacity than typical self-propelled booms of this size.

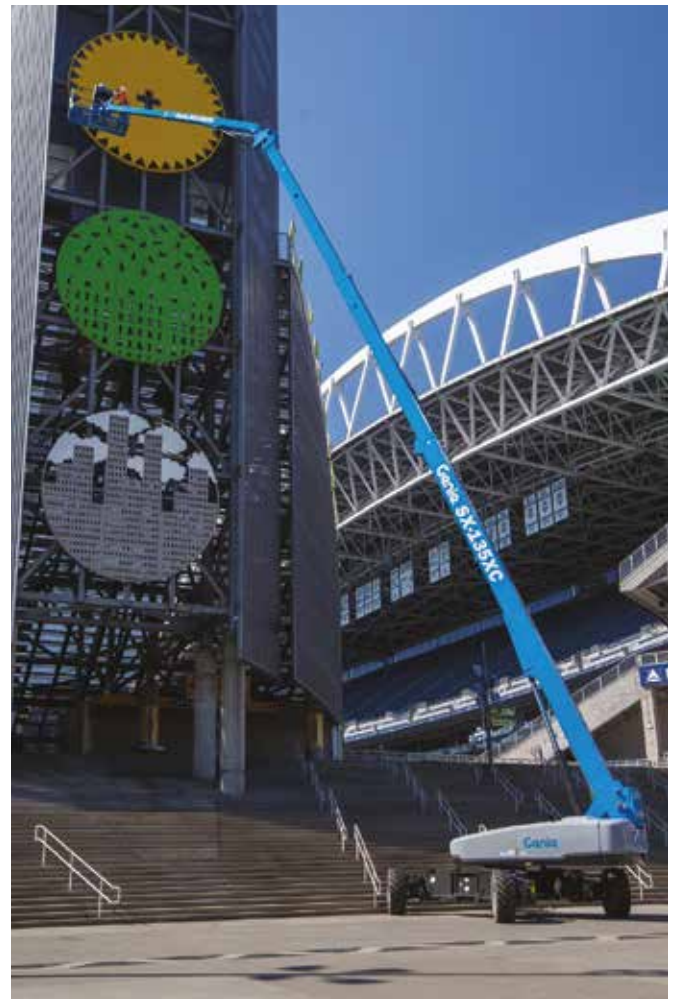
With a compact footprint of 3.94 m x 4.11 m and the ability to work 6 m below grade, the new XC design features a standard 2.44 m tri-entry platform with side-swing gate delivering an unrestricted 300 kg capacity for two people, or a restricted 454 kg capacity for three people while still leaving room for tools and materials.

The Genie SX-135XC boom can lift operators safely and quickly to full platform height - 41.15 m - in two and a half minutes, and drive enabled at full height, said Genie. The unit is equipped with a Deutz or Perkins 55 kW, Tier 4/Stage IIIB emissions-compliant diesel engine with four-wheel drive and four-wheel steer capabilities. It also boasts excellent range of motion with a 5.48 m - 9.14 m telescoping jib-extend jib, which offers operators up-an-over capabilities, as well as 125 degrees of jib articulation, boasting 55 degrees down to 70 degrees up of vertical articulation.

For easy transport, the Genie SX-135XC boom features the new Genie mini XChassis axle design, which extends and retracts the axles to and from the stowed position with a more compact footprint - 2.49 m x 4.11 m retracted or 3.94 m x 4.11 m extended - to provide both stability on the job and a narrow profile for transport. Weighing 21,546 kg, with an overall transport length of 13.28 m, a tail swing of 1.14 m and a ground clearance of 0.38 m, the Genie SX-135XC boom lift is transportable on a standard trailer; no over-width or over-height permits are required, said Genie.

The Xtra Capacity, or XC, nomenclature also lets rental customers know that this new boom complies with the overload restriction guidelines in the current European EN280, the proposed ANSI A92 and CSA B354 industry standards in North America, as well as Australian AS 1418.10 standards.

The new Genie SX-135XC boom shares commonality in design, parts and accessories, as well as serviceability benefits, including easy access to crucial service points, with all Genie products.



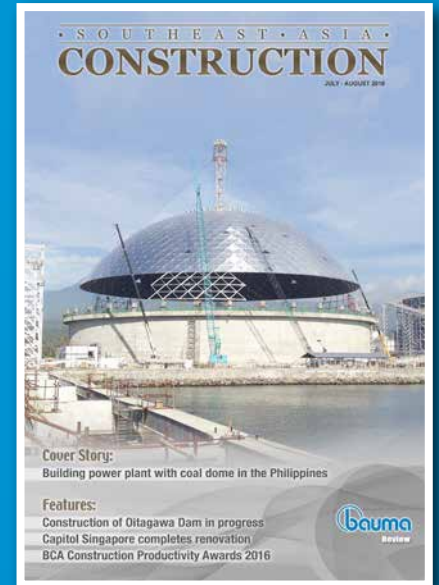
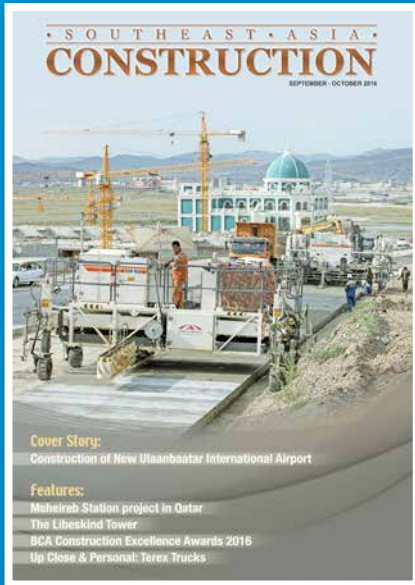
To increase performance, decrease set-up time and improve the overall productivity, all Genie XC models boast the ability to

do zero-load field calibration. These new Genie booms are equipped with a load sense cell that continuously checks the weight in the platform and adjusts the envelope to match the load chart. A tilt sensor also gives users access to different ranges of motion based on the machine's rated slope limit, on certain machines even on extreme angles, maximising the ability to access even the most hard-to-reach work areas.

Production of the new Genie SX-135XC self-propelled telescopic boom lift is expected to begin in the fourth quarter of 2016, for global delivery scheduled at the end of the first quarter of 2017. ■



Top and left: Genie's new SX-135XC self-propelled telescopic boom lift is the first model in the new Genie Xtra Capacity (XC) stick boom family.



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# GOMACO

**BOOTH: C30380**

The new three-track Commander III Xtreme from Gomaco has the ability to slipform a 610 mm radius. The new Extreme Package for multi-application pavers includes rotary-sensored slew drives for steering, sensed leg positioning, independent travel circuits to each track, radius software, Gomaco's three-sensor radius system, and repeatable mould offset.

The Commander IIIx features extreme turning capabilities with rotary-sensored slew drives on each of the three tracks. Gomaco has created the new extreme radius software bundle for the G+ control system that allows the operator to programme the size of the radius into the controller. As the Commander IIIx approaches the radius, with the values already dialled in, the operator activates the radius programme, and the curb and gutter machine slipforms around the radius.

G+ manages all aspects of travelling around the radius, including track angles and variable track speeds. When paving with stringline, the Commander IIIx uses the Gomaco three-sensor steer system for the tight radius. The proper speed of each of the tracks is maintained by G+ with independent hydraulic circuits to each track, so each one is travelling at the necessary, varied speed to maintain the smooth radius. The Commander IIIx's three tracks, equipped with rotary-sensored slew drives, also make slipforming curb and gutter in tight clearance conditions easier. Their extreme turn capability, combined with the Commander IIIx's All-Track Steering and All-Track Positioning, make it an intelligent paver.

The intelligent All-Track Positioning on the Commander IIIx includes a smart hydraulic cylinder on all three legs. Now, because of the smart cylinders, G+ knows the position of all three tracks. Intelligent offset is accomplished with a smart hydraulic cylinder for telescoping the mould mounting system. This provides G+ the ability for repeatable mould offset. And the trimmerhead and mould have independent vertical adjustments for raising and lowering.

G+ quiet technology makes this one of the quietest pavers on the market today, said Gomaco. It has been built to accommodate Tier 4 engines and their cooling packages. The Commander IIIx pivoting operator's console allows the operator to have hands-on control and clear view no matter what application is being slipformed or what the direction of travel. It has an optimised



cooling package with the hydraulic fan controlled by G+ to adapt cooling needs to jobsite conditions for both a quiet and efficient operation. It has improved fuel efficiency with a power-optimised engine and load-sensed hydraulic circuits. The three-track Commander IIIx is available with an optional on-board camera to monitor designated areas of the slipforming process.

The Commander IIIx's G+ control system easily interfaces with stringline or a 3D guidance system for curb and gutter, tight radius applications. It is also available with Gomaco Remote Diagnostics (GRD) for machine troubleshooting, diagnostic reviews, software updates, and more.

### New G+ remote control

Gomaco also offers its new G+ remote control, which can be used with any Gomaco three-track curb and gutter machine currently equipped with the G+ operating system. It features a 109mm graphic display screen that shows the run functions of the machine, the same information that is normally viewed at the operator's console on top of the paver. Most paver functions are included on the remote and are controlled with easy to operate and durable dials or switches. It also gives the operator individual control of each leg of the paver with automatic/manual adjustments for elevation and steering.

The lightweight remote control allows hands-on safety at all times. It has an emergency stop button and an alert horn on the remote that are always within reach for quick access. It is also equipped with two

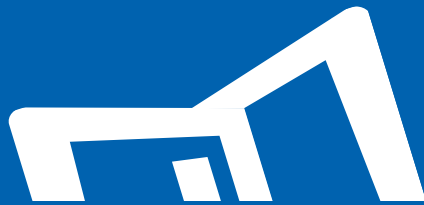


Top: Gomaco's three-track Commander III Xtreme slipform paver.

Above: The G+ remote control can be used on any Gomaco three-track curb and gutter machine with the G+ operating system.

lithium-ion batteries and a 12-V charger. An optional AC adaptor is available for purchase.

Gomaco's G+ control system features simple machine operation, fast machine response, pinpointed troubleshooting and a fault history. It operates in all the major languages of the world and in the imperial or metric system. It has a lightning-fast processing speed with two-way communication between paver accessories and G+. Its instant digital feedback and closed-loop electronic and hydraulic control create an efficient and accurate concrete paving experience. ■



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# MANITOWOC

**BOOTH: G3348**

Among Manitowoc's cranes that will be at the show are the Grove GMK5250L and GMK5150L all-terrain cranes. These two long-boom units are appearing for the first time at a trade show in North America. Both models are mounted on five-axle carriers and are notable for their boom lengths. The 70 m boom available on the 250 t (300 USt) GMK5250L and the 60 m boom available on the 150 t (175 USt) GMK5150L are the longest in each of their respective classes, said Manitowoc.

Both machines also feature a single engine, an innovative design concept pioneered by Grove in larger all-terrain cranes. The inclusion of only one engine delivers a number of benefits, including more flexible configurations for travel. This is especially useful for US customers, who frequently have to adjust the transport configurations of their cranes when moving from state to state, or even from county to county.

In addition, the new Grove GRT880 rough-terrain crane, with a 75 t (80 USt) capacity, will also be publicly displayed in North America for the first time. Boasting a new design, which also features on the company's GRT8100, the GRT880 incorporates Manitowoc's Crane Control System (CCS).

Both the GRT880 and GRT8100 are more reliable than ever before, thanks to the extensive product testing performed at Manitowoc's Product Verification Centre (in Shady Grove, Pennsylvania, the US). In this facility, each component undergoes extensive validation as part of the design process, to deliver better overall product performance from the finished crane.

For the Potain brand of cranes, there are three machines on show: one new self-erecting crane, plus two top-slewing tower cranes. The self-erecting crane is the Hup 40-30 from the innovative range of machines that were unveiled in 2016. The unit is appearing at a major exhibition for the first time and its headline feature is the class-leading versatility and agility of a design that offers 16 different options for configuration. Technology features strongly, too, with the Hup 40-30 including a new remote control; Potain's Smart Set Up software; and High Performance Lifting (HPL) winch technology.

The two Potain top-slewing cranes at Conexpo have a strong technology focus also, primarily through their updated design that incorporates CCS. The MD 559 will showcase how CCS technology has been



Above: Grove GMK5250L all-terrain mobile crane.



Left: Potain Hup 40-30 self-erecting tower crane.

incorporated into Potain's line of high capacity MD cranes. From the topless range of Potain cranes, the company will show the MDT 219 - the highest capacity model in the MDT CCS City tower range, which was introduced in 2016.

The inclusion of CCS in Potain tower cranes brings a number of advantages, including fast and easy set-up, which can be managed in as little as 15 minutes, according to Manitowoc. The technology also offers closer management of lifting operations which in turn delivers greater capacities. Maintenance is easier thanks to the on-screen maintenance tool, while the usage of

standardised components means spare parts are easily available.

From the National Crane brand, an all-new boom truck series will make its tradeshow debut. Manitowoc will feature a model from the NBT40-1 series, a new trio of boom truck cranes that are fully compliant with ANSI A92.2 and ASME B30.5 ratings, as well as OSHA standards, to offer customers the versatility of both a boom truck and an aerial lift. This new series will be especially useful for the utility industry, where energy work on power lines and new infrastructure construction often require the use of both a crane and an aerial platform. ■



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# SKYJACK

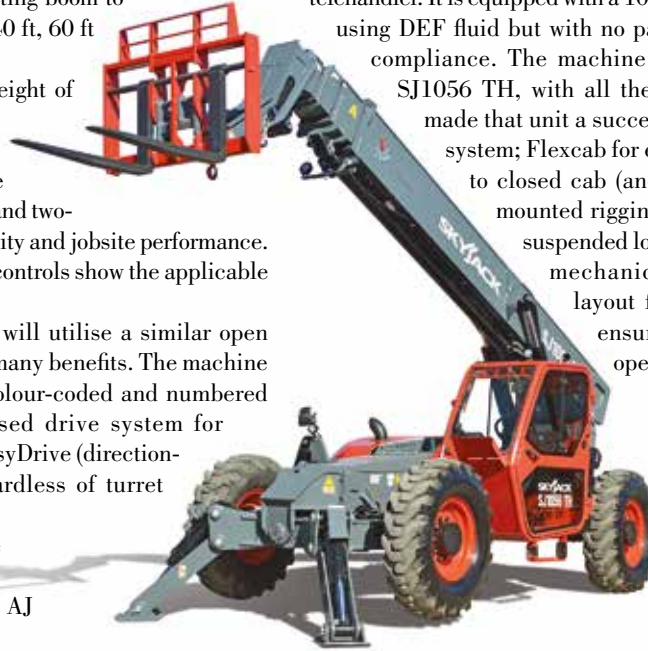
**BOOTH: G4452**

Following the launch of the SJ86 T telescopic boom in 2015, Skyjack will now introduce the SJ85 AJ articulating boom to complete its boom line-up in the main 40 ft, 60 ft and 80 ft classes.

The new SJ85 AJ has a platform height of 25.9 m, working height of 27.73 m, horizontal reach of 17.07 m, and up and over clearance of 10.36 m. The machine has a dual capacity rating of 340/227 kg and two-three people rating, to increase productivity and jobsite performance. The indicator lights on upper and lower controls show the applicable working zone and platform capacities.

As with the SJ63 AJ, the SJ85 AJ will utilise a similar open centre knuckle riser design, providing many benefits. The machine also features Skycoded (relay-based colour-coded and numbered control system); AxleDrive (axle-based drive system for excellent rough terrain traction); and EasyDrive (direction-sensing drive and steer controls regardless of turret position over chassis).

Just as Skyjack's SJ63 AJ has become a leader in the 60 ft articulating class, the company expects that its new SJ85 AJ will redefine the 80 ft articulating class.



Skyjack will also be showcasing a prototype of SJ1256 TH telehandler. It is equipped with a 107 hp Deutz TCD3.6L powerplant, using DEF fluid but with no particulate filter for Tier 4 Final compliance. The machine will be heavily based on the SJ1056 TH, with all the same Skyjack features which made that unit a success, including: Skycoded control system; Flexcab for easily converting open cab units to closed cab (and vice versa); Readyhook yoke mounted rigging hook for effective handling of suspended loads; and shared control systems, mechanical, electrical and hydraulic layout from the rest of the TH range, ensuring instant familiarisation for operators of other TH machines. ■

Skyjack will showcase a prototype of its new SJ1256 TH telehandler. The machine is designed based on the SJ1056 TH (pictured).

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