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CONSTRUCTION

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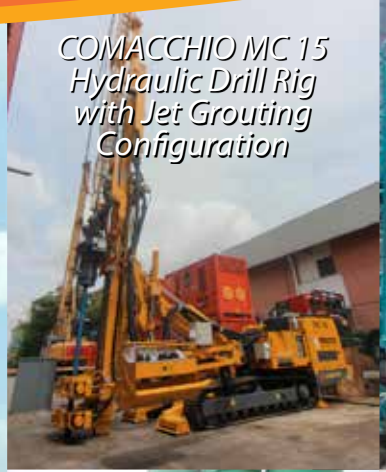

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Public sector to boost Singapore's construction demand

The Building and Construction Authority (BCA) projects the total construction demand or the value of construction contracts to be awarded in Singapore to reach between S$28 and S$35 billion this year, higher than the preliminary estimate of S$26.1 billion for last year. This projected stronger construction demand is due to an anticipated increase in public sector construction demand from about S$15.8 billion last year to between S$20 and S$24 billion this year, said BCA. The public sector is expected to contribute about 70 percent of the total construction demand, boosted by an increase in demand for most building types and civil engineering works.

In view of the current slowdown in the property market and continued economic uncertainties, the private sector construction demand is likely to remain subdued and is projected to stay between S$8 and S$11 billion this year, added BCA. This year's projects include:

1. Residential projects - a steady pipeline of new public housing construction, upgrading works for HDB flats, and a number of upcoming sizeable condominium projects earmarked for developments on various Government Land Sales sites at Siglap Road, Martin Place and Anchorvale Lane.
2. Commercial projects - redevelopment projects such as Funan DigitaLife Mall at North Bridge Road, Golden Shoe Carpark at Market Street and CPF Building at Robinson Road.
3. Industrial projects - HDB's Defu Industrial City and JTC's Logistics Hub @ Gul.
4. Institutional and other building projects - more healthcare facilities such as the new National Cancer Centre at Outram and an Integrated Intermediate Care Hub at Jalan Tan Tock Seng as well as various educational facilities. A significant amount of private sector investments in tourist attractions and recreational facilities at Mandai Lake is expected to go ahead this year.
5. Civil engineering projects - mega public sector infrastructure projects which include various major contracts for the second phase of the Deep Tunnel Sewerage System (DTSS phase 2), North-South Corridor and Circle Line 6.

Last year, the total construction demand was slightly lower than forecast mainly due to the rescheduling of a few major public sector projects to this year as longer preparation times are needed to implement these large-scale projects, explained BCA. Despite the slight shortfall from the forecast, total public sector construction demand last year was higher than the S$13.3 billion in 2015, supported by the strong demand for civil engineering projects.

The total construction output or progress payments made for the work done has continued to remain high at S$35.1 billion last year, a slight moderation from S$36.4 billion in 2015. BCA expects the total construction output to moderate further to between S$30 and S$32 billion in 2017.

2018 to 2021

Furthermore, the average construction demand is projected to be between S$26 and S$35 billion per annum in 2018 and 2019, and between S$26 and S$37 billion per annum in 2020 and 2021.

BCA estimates public sector construction demand to be between S$18 and S$23 billion per annum from 2018 to 2021, with similar proportions of demand coming from building projects and civil engineering works. Besides public housing developments and more healthcare and educational facilities, public sector demand over the medium term will be supported by various upcoming mega infrastructure projects such as the Jurong Regional Line, Cross Island Line, and various infrastructure developments for Changi Airport Terminal 5.

"Although the year-to-year fluctuations in the total value of annual construction demand are influenced by the lumpy nature of major infrastructure projects, the overall on-site construction activities or construction output is expected to stay at a relatively high level," said Dr John Keung, CEO of BCA. "The overall construction demand prospects over the medium term as well as the long term will continue to be bolstered by a strong pipeline of public sector construction projects. Companies that are prepared to change, innovate and transform to stay at the forefront of technological innovation, process re-engineering and productivity improvement are more likely to sustain their growth and competitiveness despite the headwinds under challenging economic conditions." ■

BASF to open first plant in Myanmar

BASF plans to open its first manufacturing plant in Myanmar this year. To be located in Yangon, the facility will be designed to produce tailor-made construction chemical solutions for the local building market from BASF's Master Builders Solutions portfolio.

BASF opened its service office in Yangon in September 2015. Through local Myanmar distributors, the company has been offering solutions to Myanmar customers for the past 10 years, including concrete admixtures, construction systems and mining chemicals.

"As Myanmar's construction industry grows more sophisticated in its scope, which includes high-rise buildings, roadways and bridges, the requirement for high-quality technical and construction chemical solutions will increase. BASF has a successful track record in supporting major building and infrastructure projects in Myanmar such as Thilawa Special Economic Zone, Yeywa hydropower dam, Myingyan steel mill, and others. We can draw on our decades of experience in the region and around the world to support Myanmar's development in this important sector," said Christian Mombaur, head of the BASF Construction Chemicals division's regional unit in Asia.

BASF provides emerging markets such as Myanmar with market-ready results from its global research and development network. Solutions include MasterRoc, MasterFlow, MasterSeal, MasterGlenium, MasterRheobuild and MasterPozzolith. ■

BASF is planning its first concrete admixtures plant in Myanmar to support the growth of the local construction industry.

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Hong Kong's South Island Line starts operation

Hong Kong MTR's new South Island Line started its operation on 28 December 2016, serving the 350,000 residents and workers in Southern District. The new line runs in a combination of underground sections and on elevated structures, with five stations in total. Atkins was appointed by the MTR Corporation to provide the detailed design for two new elevated stations at Ocean Park and Wong Chuk Hang, 1.9 km of new elevated viaduct, a new 247 m bridge spanning the Aberdeen Channel Bridge, noise barriers, widening of a major open nullah for drainage, slope works, complex utility diversions and other associated works.

"As the South Island Line is an elevated railway on the densely populated Hong Kong Island, it was a particularly challenging project as it is becoming progressively more difficult to build above ground railway lines in Hong Kong," said John Blackwood, Atkins' director for transport in Asia Pacific.

Stakeholder engagement was a key success factor for the project. One of the key challenges was to ensure an optimal design whilst recognising stakeholders' requirements, both during and after construction. Another key aspect was to ensure that the visual impacts of the above ground structures were sensitively treated.

The noise barrier design is fully integrated with the overhead line and trackside auxiliary system, which allows a noticeable reduction in the overall width and height of the railway viaduct. This minimises the disturbance to the existing properties along the alignment. Reduced steelwork, structural envelope and maintenance requirement for the viaduct led to significant cost and time savings during the construction. ■

Above and left: Atkins was involved in HK MTR's South Island Line project, which began its operation in December 2016.

First Demag AC 220-5 all-terrain crane delivered to Asia

Mobile Cranes Asia (MCA) Pte Ltd, Terex Cranes' long-time distributor based in Singapore, has ordered three Demag AC 220-5 all terrain cranes. MCA took delivery of the first unit during bauma China exhibition in Shanghai in November 2016. According to Terex Cranes, this is the first Demag crane delivery to Asia after the brand relaunch earlier in 2016.

"Crane operators think highly of the Demag brand, and we're excited to be able to offer it to our customers," said Rodney Chang, president of MCA. "Customers expressed a lot of interest in the Demag product over the past several months leading up to the show. The Demag brand's rebirth has gotten the attention from customers who want the highest quality and innovative equipment."

The Demag product range consists of 13 all terrain cranes, ranging from 55 to 1,200 t of capacity and seven lattice boom crawler cranes, ranging from 400 to 3,200 t of capacity. ■

Singapore-based MCA recently ordered three Demag AC 220-5 all terrain cranes. The company took delivery of the first unit during bauma China exhibition in November 2016. This marks the first Demag crane delivery to Asia.

Huationg wins new contracts in Singapore

Huationg Global Limited has secured several new civil engineering contracts from various parties totalling approximately S$87.1 million. Among the major projects are: earthworks and surcharging works at Tuas Terminal Phase 1 Reclamation, wharf construction and dredging; improvement works to surface car parks (batch 70); proposed infrastructure works at Tuas South Boulevard Extension; and construction of Buangkok Drive (Extension) in Hougang Town (Part 1) and construction of Bus Bay/Bus Shelters along Buangkok Crescent and Buangkok Link. These projects are planned to be delivered in phases over the next two to three years.

Patrick Ng, chief executive officer of Huationg Global, commented, "We are pleased to have secured these public infrastructure contracts from a number of our key established clients. Moving forward, we shall continue to focus on our strength in delivering value added services and technical competence in our specialty area of civil engineering." ■

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Soletanche Bachy plays role in HKIA's 3RS project

As part of the extension of Hong Kong International Airport (HKIA), Soletanche Bachy, a subsidiary of Vinci specialising in foundations and soil technologies, has entered a 50-50 joint-venture with its South Korean partner Sambo E&C. Together, they are carrying out soil reinforcement using the Geomix technique (Cutter Soil Mixing - CSM) in height-restricted conditions near the airport's existing north runway. The contract, signed at the end of September 2016 and worth €380 million (HKD3.31 billion), also includes the construction of a temporary 1,500 sq m metal platform on piles around the approach beacons to the north runway, which will remain in service throughout.

By 2030, the number of passengers forecast to use HKIA will reach 102 million per year, compared to 68 million in 2015. To cope with this increase in traffic and provide airlines with capacity to introduce new destinations and more flights, HKIA is building a third runway on 650 ha extending over the sea (the development of a three-runway system, or known as the 3RS). Work started at the end of 2016 with the initial measurement and test phases, and maritime operations, and will be completed within two-and-a-half years.

The safety and Airport Height Restriction (AHR) constraints imposed forbid the use of equipment taller than 5 m, making this site very complex. The work has to be carried out without ever interrupting the airport's activity. All of the work will be done from the sea using barges equipped with sophisticated monitoring systems, notably to anticipate the impact on construction from risks such as infringement of AHR, waves and typhoons.

Geomix is a Soletanche Bachy process that enables the characteristics of the soil in place to be improved using a soil-cement mix. It offers a more economic and safer solution, which has lower environmental impact, notably due to the reduction in natural resources used and spoil produced. Up to 18 Geomix soil-cement mixing plants will be installed on site, allowing for low headroom deep cement mixing. It is said to be the biggest Geomix soil reinforcing operation ever undertaken by Soletanche Bachy.

To meet the environmental demands of the contracting authority, HKIA, and the prime contractors, Atkins and Mott MacDonald, numerous protection measures have been put in place to limit the risk of pollution. These include permanent monitoring of water quality, triple antipollution floating barriers, the establishment of a safety perimeter, and environmental training to monitor and safeguard marine life in the estuary. ■

Keppel wins Singapore's fourth desalination plant contract

Keppel Infrastructure Holdings Pte Ltd, through its wholly owned subsidiary Marina East Water Pte Ltd, has signed a 25-year Water Purchase Agreement with PUB, Singapore's national water agency, to build Singapore's fourth desalination plant. To be located in Marina East, the desalination plant will be constructed under a design, build, own and operate (DBOO) model and is expected to be operational in 2020.

When completed, it will be able to produce 137,000 cu m of fresh drinking water per day. The plant is said to be the first in Singapore with the ability to treat seawater, and fresh water from the Marina Reservoir, by using reverse osmosis and other advanced membrane technology. Keppel Infrastructure is a wholly owned subsidiary of Keppel Corporation. ■

Keppel to develop residential projects in Jakarta

Keppel Land, through its wholly-owned subsidiary, PT Sukses Manis Indonesia, has taken a 50 percent stake in a joint development with PT Metropolitan Permata Development, a subsidiary of PT Metropolitan Land Tbk (Metland). The joint development plans to build about 450 landed homes on a 12-ha site in Tangerang, a satellite city located adjacent to West Jakarta. Keppel Land is a subsidiary of Keppel Corporation.

Strategically located within the established Metland Puri township, future residents can enjoy excellent connectivity to business districts and various facilities and amenities via the Merak Toll Road and Karang Tengah Toll Road. The Soekarno-Hatta International Airport is also just a 30-minute drive away. ■

Grove cranes to help Thailand power up

The Provincial Electricity Authority (PEA) in Thailand recently ordered eight Grove GMK2035E all-terrain cranes. The company plans to use them to erect electrical poles and install transformers at sites around the country.

The GMK2035E cranes are new additions to the PEA fleet, which already includes six GMK2035 cranes. The GMK2035 is the predecessor to the GMK2035E.

All the GMK2035E cranes were supplied by VDS Machinery, the official Grove dealer for Thailand. This model has an excellent mobility as well as an option to lift with both mid-span and full-span outrigger deployments.

The GMK2035E is Grove's most compact all-terrain crane, and includes a 29 m main boom that can be extended to 46 m with jib extensions. Maximum capacity is 40 t and power comes from a 205 kW Mercedes engine. The deliveries are expected to be complete by the end of the first quarter of 2017. ■

Staff from Manitowoc, VDS Machinery and PEA at a ceremony in Bangkok to celebrate the handover of the first units of GMK2035E.

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Terex Trucks appoints dealer in Australia

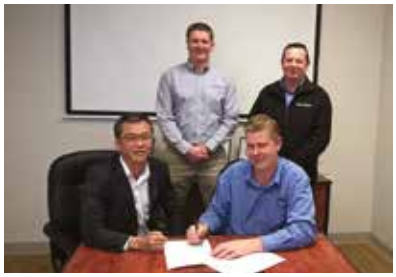
OPS Equipment has been appointed Terex Trucks' national dealer for Western Australia (WA), South Australia (SA) and the Northern Territory (NT). Founded in 1989, OPS provides equipment sales, service and consultation to customers active in the mining, screening, crushing, washing, block making, earthmoving and construction industries.

This dealership will enable OPS to broaden its portfolio and offer customers all three articulated haulers manufactured by Terex Trucks. OPS will also deliver an extensive aftermarket care service to minimise costs, maximise uptime and productivity.

"OPS prides itself on providing quality support to its customers in the segments served, which include mining, earthmoving, civil construction and quarries, and these are areas that fit extremely well with Terex Trucks' client base," said Clement Cheong, director of sales and marketing APAC at Terex Trucks. "The company has gained a good reputation in the market for the products and services it delivers, and we are confident that OPS will bring the same enthusiasm to Terex Trucks' customers."

Headquartered in Jandakot, Western Australia, with two additional locations in Darwin and Adelaide, OPS offers 24 hour client support, seven days a week and 365 days a year. The company has a team of experienced technicians, who have expert know-how in the areas of mechanical fittings, repairs, electronic diagnostics and job specific fabrications.

"OPS is delighted to partner with Terex Trucks in WA, SA and NT. We believe the two organisations' values and objectives are aligned, such as the simplicity of product for maximum operational effectiveness, quality customer service and a leading, first class aftermarket back up offering. OPS is committed to providing all our existing and new Terex Trucks customers with a new level of service and support and look forward to fostering a long partnership with Terex Trucks," commented Shane Czerkasow, MD of OPS. ■



Above and left: Terex Trucks has appointed OPS Equipment as its national dealer for Western Australia, South Australia and the Northern Territory.

MHE-Demag establishes new crane manufacturing plant in Malaysia

MHE-Demag, a joint venture between Terex MHPS GmbH and Jebsen & Jessen (SEA) Pte Ltd, has officially opened its largest manufacturing and warehouse facility in Bukit Raja, Malaysia. Developed at a cost of RM45 million, the facility can operate at a capacity of 200,000 production hours a year, a 54 percent increase from the previous site. The facility is also expected to support the fabricated metal products and machinery & equipment industries.

With a built-up area of close to 15,000 sq m sitting on over 26,000 sq m of land, the plant is also believed to be the largest and first-of-its-kind crane manufacturing facility in Malaysia and the region. Capable of building cranes of up to 50-m span, this plant will primarily serve customers from Malaysia, Australia, Cambodia, Myanmar and Singapore, who hail from various industrial sectors where lifting, moving and maintenance of materials or machineries are required.

"This investment cements MHE-Demag's commitment to Malaysia over the past 40 years, and is an important step forward for us. This plant is the largest and most modern of our 11 manufacturing facilities across the Southeast Asia region," said Karl Tilkorn, regional managing director of MHE-Demag. "Each industrial crane needs to be individually designed and custom fabricated, hence the larger production facility along with state-of-the-art equipment will allow us to maintain our leadership position to meet the high standards required by our growing customer portfolio, particularly with the prestigious projects we have secured."

In addition, the facility will host MHE-Demag's regional training centre, where employees and customers throughout the company will attend skills training and upgrading programmes to ensure excellence in operations, maintenance and safety for industrial cranes is maintained. The facility is also a showcase of MHE-Demag's innovative solutions. Leading MHE-Demag material handling products such as lift trucks, dock levellers, aerial work platforms, building maintenance systems for safe working at heights, as well as automated car parking systems are employed in industrial applications throughout this facility. ■

The official opening of MHE-Demag's largest crane manufacturing plant in Malaysia.

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Liebherr opens new office in Saudi Arabia

To further improve its services for customers in Saudi Arabia and neighbouring countries in the Middle East, Liebherr has established a new subsidiary in Dammam. The facility will house sales and service staff from the Mobile and Crawler Cranes, Deep Foundation, Tower Cranes and Concrete Technology Product Divisions.

Liebherr has been present in Dammam for the last 12 years, and the company had outgrown its old offices in rented buildings. To enable it to respond more quickly to market and customer needs, Liebherr decided to have its own office complex. The new, more modern buildings now provide more warehousing space to enable improved spare parts supplies and greater availability of parts in general.

The new complex with around 30 staff also enables the company to deliver better after-sales and repair services for Liebherr customers. "Repairs, after-sales service using genuine parts, washing and testing – we can now provide our customers with a complete care-free package," said Markus Burgstall, Liebherr's manager of the Mobile Cranes Division in Saudi Arabia.

The new Liebherr subsidiary in Dammam, Saudi Arabia.

Saudi Arabia is one of the main markets for Liebherr in the Middle East. The company has had its own employees there for 35 years. Its headquarters is located in Jeddah and the company also has offices in Riyadh. ■

Product presentation during the opening ceremony of the new Liebherr subsidiary.

Haulotte telehandler goes to China

Chongqing Baisitai Machinery Pte Ltd (BST) recently added a Haulotte HTL4014 to its rental equipment fleet. Not only does this mark the first telehandler purchase for BST, but it is also said to be the first Haulotte telehandler to enter the Chinese construction market.

BST was founded in April 2015 as a division of Zhibang Group specialising in aerial work platforms (AWP). Zhibang has been a dealer of heavy construction machinery for the past 12 years, and in that time has established a strong footprint in the excavator industry.

"We researched and observed the AWP industry for two years before setting up BST. Our conclusion is that, compared to the construction machinery market as a whole, the AWP industry holds the greater future potential. The rapid growth in this area is already clearly visible," said Liao Jingbo, deputy general manager of Zhibang.

From its inception, BST has been working closely with Haulotte. To date, the company counts 180 Haulotte machines among its 300-strong fleet. The new telehandler purchase holds great strategic significance for BST, as the company is seeing the demand for this type of machine increasing. Going forward, BST hopes to become a leader and make its mark in the AWP industry in China's western regions.

"Our role in this collaboration is to combine our extensive experience in the construction machinery sector with our interactions with Chinese customers to give Haulotte suggestions for additional features to ensure that their machines ideally fit the requirements of the Chinese market," said Wu Weidong, general manager of BST. ■

Haulotte's HTL4014 telehandler on display at the bauma China exhibition in November 2016.

New solar power plant in Andhra Pradesh

Azure Power, an independent solar power producer in India, has started the construction of its 100 MW solar power plant in Andhra Pradesh. The company has secured land and financing for this project.

Scheduled to be commissioned by the second quarter of 2017, the project was auctioned by NTPC, Government of India's largest power utility, designated under National Solar Mission for a total capacity of 1,000 MW of solar power projects at Kurnool Ultra Mega Solar Park. The solar park is being developed by Solar Park Implementation Agency (SPIA), Andhra Pradesh Solar Power Corporation Limited (APSPCL). ■

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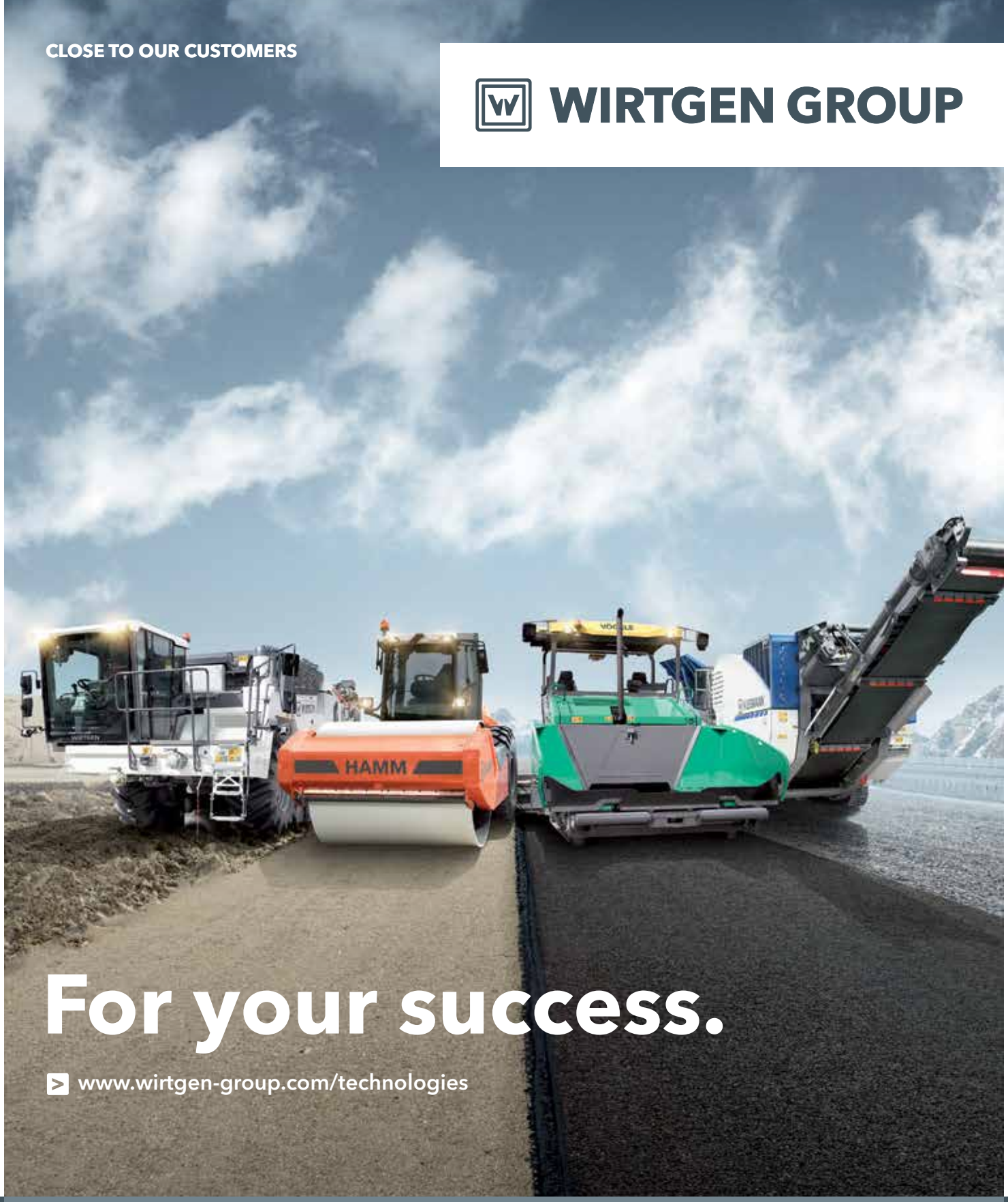

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Terex Cranes refocuses manufacturing strategy

Terex Cranes has stepped up its product innovations and refocused its manufacturing strategy. The company plans to launch a new flat top tower crane, re-enter the City class crane market and introduce a 300 t six-axle crane. Among other machines and the latest technologies offered, the company will also introduce a new SK series hammerhead tower crane.

"We are committed to being the most customer-responsive company in the industry through providing valuable product and service solutions that produce an excellent return on the customer's investment," said Terex Cranes' president, Steve Filipov. "For us to deliver on these commitments and innovate the technologies of today and tomorrow, we must be laser-focused on controlling our costs, aligning our manufacturing footprint with market conditions and creating a more streamlined and responsive organisational structure."

Part of this cost alignment strategy includes identifying and focusing on core competencies in-house. As a result, the company announces plans to sell a fabrication components and parts facility it currently operates in Pecs, Hungary. In addition, Terex Cranes will consolidate its three current manufacturing locations in Zweibrücken, Germany, into two. The company will continue manufacturing operations of the Demag crawler and all terrain crane lines in its Dinglerstrasse and Wallerscheid locations and make multimillion-dollar investments in both facilities to support ongoing manufacturing operations. However, it will cease machine production in the Bierbach facility in 2017 and the facility will be sold.

These consolidation and cost alignment strategies continue actions taken by the company in 2016 to make more efficient use of its manufacturing footprint. In 2016, Terex Cranes consolidated all North American crane production into the existing Terex manufacturing facility in Oklahoma City, Oklahoma. The sale of the Material Handling and Port Solutions business to Konecranes will include the Cranes Montceau Les Mines, France production facility, which manufactured four Terex all terrain crane models. Production of these crane models is being absorbed by other Terex manufacturing locations.

"With the consolidation efforts started in 2016 and the announced changes in Hungary and Zweibrücken in 2017, the Cranes business global headcount will be reduced by approximately 30 percent. While these decisions are difficult to make, they are necessary to build a stronger, more focused and efficient Terex Cranes that will continue to innovate and grow," added Mr Filipov. "The steps taken will allow us to continue to invest in product innovation and service to drive customer satisfaction and the resulting business success." ■

AECOM Team to design new Schiphol pier

Royal Schiphol Group will be designing the pier of the future together with the AECOM Team. The successful bid team has been commissioned to deliver a full design for the new pier and airside facilities in late 2017. It brings relevant Dutch capability combined with international experience in aviation, architecture, sustainability and interior design from AECOM, Cepezed, Imd, dGmR and Copijn.

The new pier is expected to be operational in late 2019 and will give Schiphol eight new gates. There will be five new gates for narrow-body aircraft on the north side, while the south side will have three gates for wide-body aircraft, which can also be used to connect six narrow-body aircrafts. In a later stage two additional wide-body gates will be created on the south side of the new pier.

Birgit Otto, COO of Royal Schiphol Group, said, "The AECOM Team has a clear vision of the contribution it can make to achieving the aims of Schiphol. The team has also managed to demonstrate that rapid construction does not necessarily have to be at odds with the sustainability objectives of Schiphol and an attractive passenger experience."

Schiphol needs to expand facilities to accommodate the growth in the number of passengers and air transport movements.

An artist's impression of the new pier and terminal.

In order to further develop its position as multi-modal hub and 'preferred Airport', Schiphol is on the eve of various comprehensive infrastructural investment projects, such as the construction of a new pier and terminal, modifications to the landside infrastructure and parking facilities and improvements to the train and bus station. ■

Volvo CE's headquarters to move to Sweden

Volvo Construction Equipment (Volvo CE) will move its global headquarters from its current location in Brussels, Belgium to Gothenburg, Sweden. The relocation will facilitate closer cooperation with the company's other business areas and allow for better usage of the competence and resources of the whole Volvo Group.

"Our Brussels location has served us well since the office opened in the 1980s and this move comes at the right time for Volvo CE as we continue to adapt our company to changing global business dynamics. It allows us to be physically closer to the other Volvo business areas and it will facilitate closer cooperation and sharing of best practices," said Martin Weissburg, president of Volvo CE and member of the executive board of the Volvo Group. "Sweden is also home to approximately 4,000 Volvo CE employees and where some of our largest manufacturing, commercial and technology sites are located." ■

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Poland builds tallest tower

The construction of Varso Tower in the heart of Warsaw city centre, Poland, has commenced with completion scheduled for 2020. At 53 stories (310 m), it is set to be the tallest building in the country.

The project, being developed by international real estate developer HB Reavis, comprises three buildings including an office tower designed by Foster + Partners. With a total of 140,000 sq m, Varso will be able to accommodate both large international companies as well as smaller start-up businesses in its highly adaptable office spaces with average floorplates up to 4,000 sq m.

The building will also feature an observation deck, which at 230 m will make it one of the highest in Europe. In addition, there will be a restaurant on levels 46 and 47 for visitors, and a wide range of facilities and services such as shops, restaurants and cafes will occupy the buildings' ground levels.

Varso's lower buildings by Hermanowicz Rewski Architects will form a new, central frontage along one of the main streets next to the central station. The two office buildings will 'cascade' from a joint multi-storey podium with a stone clad elevation and will feature green rooftop terraces open daily for the building occupants.

State-of-the-art technologies will be introduced to reduce electricity and water consumption as well as air pollution. Varso Tower is expected to be the first project of this scale in Poland to be rated 'Outstanding' against the BREEAM certification scheme. ■

The construction of Varso Tower has begun. At 310 m, it is set to be the tallest building in Poland when completed.

Fayat to buy Atlas Copco's road construction equipment division

Fayat has agreed to buy the road construction equipment division of Atlas Copco, which manufactures rollers for asphalt and soil applications, pavers and planers. These products are known under the Dynapac brand. The acquisition is expected to be completed during the second quarter of 2017.

Fayat has deep expertise on this market through its companies Bomag, Marini, Marini-Ermont and SAE, Secmair and Breining. The acquisition of Dynapac will strengthen Fayat's strategic position in road construction and maintenance equipment.

The agreement includes sales and service operations in 37 countries and production units in five countries: Sweden, Germany, Brazil, India and China. The business has 1,265 employees and revenues of approximately SEK 2,900 million (€309 million) in 2016.

"We will continue to leverage the strengths of our existing organisations and Dynapac, in parallel: all customers will continue to be supported with their products. Dynapac has an excellent strategic place in our group and we plan on growing and expanding its presence and product offering," said Jean-Claude Fayat, president of Fayat. "We will leverage its expertise and technologies together with our existing portfolio to continuously develop equipment that closely addresses our customers' needs." ■

Hobas and Amiantit to combine European businesses

WIG Wietersdorfer Holding GmbH and Saudi Arabian Amiantit Company plan to merge their European pipe businesses, Hobas Europe and Amiantit Europe including Flowtite Technology. These companies specialise in the production of high performance plastic pipe systems and aim to operate as one unit under a 50:50 ownership structure. Both Hobas and Amiantit Europe have distinct capabilities that complement each other well; Hobas is a specialist for 'centrifugally cast', and Amiantit for 'continuous filament wound' pipe systems.

The headquarters for the new business will be in Klagenfurt, Austria. The production of pipes, which are mainly used for drinking water, irrigation, wastewater and hydropower, among others, will continue in Germany, Austria, Spain, Poland and Romania. The product brands of Hobas and Flowtite are essential and will be further developed by the new company. Research and development will continue in Sandefjord, Norway and Wietersdorf, Austria.

The merger is still pending approval from relevant authorities. Until then, Hobas Europe and Amiantit Europe will operate independently. Each company currently has around 650 employees.

Amiantit Europe and Flowtite Technology are subsidiaries of Saudi Arabian Amiantit Company SAAC listed on the stock-exchange of Saudi Arabia. The group serves municipal, civil engineering, industrial, energy, and agricultural markets worldwide, supporting global infrastructure development.

Hobas is a subsidiary of WIG Wietersdorfer Holding GmbH, a conglomerate in the construction material and pipe industry based in Klagenfurt, Austria. Hobas is known for its expertise in high performance plastic pipes systems, which are produced in Europe and the US and are sold worldwide. Products of both companies are successfully used in the areas of drinking water, irrigation, wastewater, hydropower as well as in other industries. ■

Porter to lead Link-Belt

Melvin Porter (left) will take up the position of president and CEO of Link-Belt, starting 1 May 2017. He is succeeding Chuck Martz, who will retire on 30 April 2017 after 42 years with the company. Mr Martz will remain in his role as chairman of the Link-Belt board of directors indefinitely.

Mr Porter is currently Link-Belt's CFO and vice president of finance, the position he has held since 2004, after starting with the company in 1999 as manager of financial planning and taxes. In his current role, he is actively involved in overseeing operations of Link-Belt's company stores: Triad Machinery in the northwestern US and Link-Belt Mid-Atlantic, based in Virginia. Including his time at Link-Belt, Mr Porter has over 30 years of management, financial, accounting and tax experience.

Mr Martz began his career at Link-Belt in 1975 as a cost accountant and filled various accounting and financial positions, including controller over the next 15 years. In 1990, he was named vice president of finance and administration. He also served as the company's vice president of manufacturing from 1994 to1998, before becoming president in 1998 and later CEO in 2007. Mr Martz was named chairman of the Link-Belt board in early 2009. ■

New president for LiuGong

Huang Haibo (left) has been appointed as president of Guangxi LiuGong Machinery. In this new role, he will be responsible for the strategy implementation and operations of the company. Succeeding Yu Chuanfe, Mr Huang has been with LiuGong for 25 years and has progressed through a series of technical and leadership roles.

Mr Yu had served as president of LiuGong Machinery for three years, successfully steering the company through challenging times and market. He will now take on the role of vice president with LiuGong Group, the parent company of LiuGong Machinery, and vice chairman of LiuGong Machinery. ■

Date	Events in Asia	Organiser & Contact
16 to 19 Mar 2017	Mega Build 2017 Jakarta Convention Centre Jakarta Indonesia	PT. Reed Panorama Exhibitions Tel: +62 2556 5000 Email: steven.chwee@reedpanorama.com Website: www.megabuild.co.id
10 to 14 Apr 2017	International Construction Week 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.icw.my
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
8 to 10 Jun 2017	Intermat ASEAN IMPACT Exhibition & Convention Centre Bangkok Thailand	Comexposium & IMPACT Tel: +662 833 5214 Email: chanuddaw@impact.co.th Website: www.asean.intermatconstruction.com
15 to 17 Jun 2017	Laobuild 2017 Convention Hall, DonChan Palance Vientiane Laos	AMB Tarsus Events Group Tel: +603 2692 6888 Email: ian@ambtarsus.com Website: www.laobuild.com
10 to 12 Aug 2017	LankaBuild 2017 Sri Lanka Exhibition & Convention Centre Colombo Sri Lanka	AMB Tarsus Events Group Tel: +603 2692 6888 Email: ian@ambtarsus.com Website: www.lankabuild.org
7 to 9 Sept 2017	Cambuild 2017 Diamond Island Exhibition & Convention Centre Phnom Penh Cambodia	AMB Tarsus Events Group Tel: +603 2692 6888 Email: ian@ambtarsus.com Website: www.cambuildexpo.com
10 to 13 Sept 2017	Construction Indonesia 2017 Jakarta International Expo Kemayoran, Jakarta Indonesia	PT Pamerindo Indonesia/IEM/OES Tel: +65 6233 6777, Fax: +65 6233 6768 Email: violet@iemallworld.com Website: www.constructionindo.com
20 to 23 Sept 2017	BICES 2017 New Beijing International Exhibition Center Beijing China	CCMA, CNCMC & CCPIT-MSC Tel: +86 10 52220946, Fax: +86 10 51183612 Email: info@e-bices.org Website: www.e-bices.org
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.apexasiashow.com
9 to 12 Nov 2017	Philconstruct 2017 SMX Convention Centre Manila World Trade Centre Metro Manila The Philippines	Global-Link Exhibitions Specialist Tel: +63 2 893 7973, Fax: +63 2 550 1148 Email: info@gesi.com.ph Website: www.gesi.com.ph/philconstruct
30 Nov to 2 Dec 2017	Myanbuild 2017 New Expo Hall Yangon Myanmar	AMB Tarsus Events Group Tel: +603 2692 6888 Email: ian@ambtarsus.com Website: www.myanbuild.net
Date	**Events outside Asia**	**Organiser & Contact**
26 to 29 Nov 2017	The Big 5 2017 Dubai World Trade Centre Dubai UAE	DMG Events Tel: +971 4 438 0355 Email: info@thebig5.ae Website: www.thebig5.ae
23 to 26 Jan 2018	World of Concrete 2018 Las Vegas Convention Centre Las Vegas, Nevada USA	Informa Exhibitions Tel: +1 972 536 6379 Email: info@worldofconcrete.com Website: www.worldofconcrete.com

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Ecobuild Southeast Asia returns in April 2017

Ecobuild Southeast Asia 2017 will be held from 12 to 14 April 2017 at the Kuala Lumpur Convention Centre (KLCC), hosted by Construction Industry Development Board (CIDB) Malaysia and organised by UBM Malaysia. The show will mark the fourth year of partnership with the International Construction Week 2017, a regional event for sustainable design, construction, energy and the built environment.

This year's theme, 'Towards Enhancing Quality & Safety in Construction', fits perfectly with one of the pillars of the Malaysia Construction Industry Transformation plan till 2020 (CITP). Other co-located events include Asean Solar 2017, Ecolight Asean 2017, Energy Efficiency, Greenbuild Asia, Construction Show, AseanREI and Construction Career Fair. These events are expected to attract more than 15,000 attendees from around the world.

Ecobuild Southeast Asia will also feature conferences and seminars. CDP points will be gained upon attending paid conferences organised by the supporting stakeholders, such as Master Builders Association Malaysia, The Chartered Institute of Building, Kubena and Urban Forum. Free-to-attend seminars are organised into streams, presenting a number of topics that include quality, safety and professionalism, as well as environmental sustainability, productivity and internationalisation, reflecting the categories emphasised under CITP. Seminar speakers range from industry experts to innovators and practitioners from CIDB Malaysia, Public Works Department Malaysia, Malaysia Structural Steel Association, The Institution of Fire Engineers, The Chartered Institute of Building, Nuclear Malaysia and International Workplace.

In addition, young designers will be challenged to join 'MSSA/CIDB Open Ideas Competition Youth 2017 - Dome in Steel [YouDo]', which is co-organised by Malaysia Structural Steel Association. This competition will feature a highly challenging project that involves designing an innovation, sustainability and cost effective steel dome.

Ecobuild Southeast Asia 2017 will be held in April, co-located with the International Construction Week 2017.

Business matching will also be organised by Matrade and CIDB to bring in overseas buyers. It aims to connect local suppliers/exhibitors with premier buyers for sourcing purposes. The connections are arranged by business matching specialists through face-to-face meetings. ■

Website: www.ecobuildsea.com

Informa and Zhanye to jointly launch WOC Asia

Informa Beijing and Shanghai Zhanye Exhibition Co Ltd have formed a joint venture, Shanghai Yingye Exhibition Co Ltd, to launch the World of Concrete Asia (WOCA), which will showcase a full range of products from the World of Concrete, China Floor Expo (CFE) and China Mortar Expo (CME) brands. The cooperation will begin from the next edition of CFE/CME fairs on, which will take place from 4 to 6 December 2017 at the Shanghai New International Expo Centre, China. The joint venture will expand the brand's international reach and expand these leading construction and material industry trade shows in China and Asia.

World of Concrete Las Vegas is believed to be the only annual international event dedicated to the commercial concrete and masonry construction industries. It features indoor and outdoor exhibits with the industry's major suppliers showcasing innovative products and technologies, exciting demonstrations and competitions, and world-class education programmes. This year, the show drew 50,770 registered professionals and more than 1,455 companies exhibiting across more than 681,196 net sq ft of space. Other global events include World of Concrete India and World of Concrete Europe.

"The combination of CFE, CME and the World of Concrete brands will make this a must-attend event for the construction marketplace for the domestic China and wider Asia markets," said Tom Cindric, VP of Construction & Real Estate, Informa Exhibitions. "WOCA will showcase the latest developments across the globe on many aspects of concrete and construction technology that are applicable to the country and the region." ■

WOC Las Vegas (above) is believed to be the only annual global event for the commercial concrete and masonry construction industries, organised annually by Informa Exhibitions. This year, the company will launch WOC Asia in Shanghai.

Website: www.wocasia.com

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New Singapore Standard on safe use of MEWPs

The new Singapore Standard SS 616:2016 code of practice for safe use of mobile elevating work platforms (MEWPs) was recently launched. It covers the safety requirements for the protection of persons working with MEWPs, including the basic safety principles, operation, maintenance and inspection of MEWPs.

The SS 616 complements the Approved Codes of Practice/ Singapore Standards related to lifting equipment and work at heights. The standard serves to provide more guidance on lifting equipment to help optimise workers' health and safety on the job.

"IPAF welcomes the new standard specifically for MEWPs, which will help to keep the industry safer in Singapore. As the use of MEWPs increases we want to make sure that lifting equipment is properly maintained, safely deployed and operated, and lifting activities are well-planned and well-managed to minimise the risks of accidents," explained Raymond Wat (left), IPAF's regional general manager for South East Asia. Mr Wat sits on the drafting panel and he also presented a paper at the launch event.

Tim Whiteman, IPAF's CEO & managing director added, "IPAF welcomes the launch of the Singapore standards covering MEWPs. The principles of safe use of MEWPs are the same across the world and it is excellent to see the consideration of other international standards in the development of country specific ones."

The event provided attendees with an overview of the standards and how they can improve personal and workplace safety and health; legislative requirements relating to lifting equipment and general requirements on lifting equipment, safety criteria and clearance for lifting activities.

Those attending the launch event included workplace safety and health professionals, engineers, contractors and supervisors; environment, health & safety consultants, safety officers and academics; occupier, manufacturers/suppliers and all personnel involving with lifting equipment and activities; as well as representatives from relevant government agencies. ■

Inspection and maintenance 'key to avoiding fatalities'

Rigorous inspection and maintenance regimes are vital to the safe operation of MEWPs, stressed IPAF, after a rental company manager was jailed for two years over safety failings that led to the death of one construction worker and seriously injured another.

Donald Craig of UK-based Craig Services & Access Limited was found guilty of a breach of health and safety legislation, and he was sentenced to the maximum penalty of two years imprisonment over an accident in 2012, in which Gary Currie, a safety net rigger and Alexander Nisbet, a self-employed operator, were in the basket of a platform removing netting from the facade of the Buchanan House office in Glasgow, Scotland, when a boom section buckled, causing the basket to fall 28 m to the ground. Mr Nisbet was seriously injured and Mr Currie suffered fatal injuries.

HSE principal inspector Graeme McMinn said, "The death of Gary Currie was entirely preventable. Craig Services and Access Ltd and Donald Craig were advised by the manufacturer to replace the damaged boom. Instead, they chose a much cheaper repair that left the boom in an unsafe condition.

"At the time of the accident the MEWP had a catalogue of defects, some of which were safety-critical, demonstrating that Craig Services and Access Ltd did not have an adequate proactive maintenance and reactive repair system in place. This tragic accident should highlight the absolute duty for owners of MEWPs to maintain them to ensure continued safe operation."

Chris Wraith, IPAF's technical & safety executive, echoed the HSE's warning, "This case was especially upsetting as in the view of both the HSE and the courts the incident was entirely preventable. IPAF cannot emphasise strongly enough the importance of maintaining a rigorous inspection, maintenance and thorough examination regime to any rental company or regular owner-operator of this type of equipment, in order to ensure defects are quickly identified and reported and that proper repairs are made to prevent mechanical failures, which can have tragic and far-reaching consequences.

"MEWPs are generally one of the safest options for temporary access to work at height, but this case serves to highlight why IPAF is in constant and ongoing consultation across the industry to ensure the technical and safety guidance is right for rental companies and operators alike. IPAF has been closely involved in the drafting of new inspection maintenance and thorough examination guidance. The new guidance was initiated through the UK strategic forum for plant safety at the request of the HSE; IPAF has been the technical author of the document, which is due for publication in the next two to three months." ■

Global speakers announced for IPAF Summit 2017

Access and safety experts from the US, China and the UK are among the speakers at the 2017 IPAF Summit, which will be held on 4 April 2017 in London, the UK. The event will be followed by the International Awards for Powered Access (IAPAs) dinner and awards ceremony.

The theme of this year's IPAF Summit is "Safety by Leadership." John Garrison Jr, president & CEO of Terex Corporation will deliver the keynote address. Other confirmed speakers to date include: Giles Councell, IPAF's director of operations; Matthew Elvin, CEO of Xtreme Manufacturing & Snorkel; Steve Radcliffe, managing director of Clugston Construction; Jim Senior CMIOSH, health & safety director of Multiplex Construction Europe; Chris Wraith, technical & safety executive of IPAF; and Yanna Zhang, chairwoman of the China Construction Industry Association's rental branch. ■

Website: www.iapa-summit.info

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New innovative solutions for hollow core slabs

Elematic's new Semi Floor line is well suited for the production of hollow core slabs, but it can also be used to produce other slab types such as ribbed/half slabs, solid slabs and piles. Thanks to innovations in machinery design and fully mechanised operations, the line is simple to operate and maintain. Smart machinery innovations also keep costs down – the required initial investment is approximately 20 percent less compared to a similar line with conventional solutions, according to Elematic.

Key equipment in the Semi Floor production line includes the Extruder S5, Sawpreparer S5 and Bed S5, all of which have new features for excellent slab quality and increased factory productivity. The Extruder S5 employs the original Elematic shear compaction technology that creates good quality end products and brings production costs down by minimising the use of concrete. This extruder features everything needed for efficient compaction with no superfluous extras, making it a budget-friendly choice, said Elematic.

The Sawpreparer S5 is a combination of three processes: sawing, cleaning and strand pulling. Compared to a conventional separate saw and preparer system, the Sawpreparer S5 can cut the number of lifts in half. The machine is also easy to use, featuring an advanced graphic user interface, a camera system for situational awareness and improved safety, a 4WD for fast cleaning and strand pulling, and fully electronic operation, resulting in less maintenance and higher reliability.

The Bed S5 adds even more practical features to the Semi Floor line, including a high-quality even surface and a rigid steel structure, which guarantee the straightness and evenness of slabs.

All machinery in the Semi Floor production line meets the strict requirements of the EC Machinery Directive, and the Extruder is also a low-noise machine (< 85 dB). The line can be – and almost always is – custom-built to suit the particular needs of each specific factory, said Elematic.

In addition, Elematic's new structural analysis tool, ELiSLAB 2.0, is specifically designed for structural analysts who work with hollow core slabs. It covers all relevant calculation points and offers a range of smart and practical features to make day-to-day work easier, such as the inclusion of openings and toppings in the calculation, the use of factory-based profiles and strand patterns, and a collection of national annexes for Eurocodes. Eurocode updates are available as an option.

Apart from the analysis, navigating and interacting with ELiSLAB is easy, thanks to a smart, streamlined graphical user interface that progresses logically. The software also offers an extensive reporting function that stores calculation inputs and results in detail. This means that all calculation reports are just a few clicks away when needed for the authorities or for any other purpose.

For precast producers, ELiSLAB also works as a practical tool to use in quotation process for cost calculation. The analysis tool quickly displays the required amounts of strands per slab, which simplifies the cost calculation process significantly. ■

Website: www.elematic.com

Above and below: The Sawpreparer S5 (above) and Extruder S5 are two of the key equipment in the Semi Floor production line.

Right: The new ELiSLAB structural analysis is designed to meet the needs of structural analysts who work with hollow core slabs. It covers all relevant calculation points and offers a range of smart and practical features to make day-to-day work easier.

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Link-Belt rough-terrain and telescopic crawler cranes

Link-Belt's new 110RT (left) and TCC-2500 cranes.

Link Belt's new 110RT rough-terrain crane, with a 100 mt rating, has a six-section pin and latch boom with a length of 50 m and maximum tip height of 79.8 m. A three piece bi-fold, on-board fly with an integrated 3 m section is available and can be manually offset. Operation could not be simpler with only four boom extend modes and the ability to telescope under load. The boom design incorporates Link-Belt's standard Teflon wear pucks impregnated into the wear pad surfaces so the boom requires no grease.

On board fly options include both two- and three-piece lattice bi-folds (3 – 10.6 – 17.6 m long); the fly manually offsets to 2, 15, 30 and 45 degrees. An available 3 m heavy-lift fly – integral to one of the fly options – swings and pins into place and has over 21.7 mt of lifting capacity with one-load two-line lift procedures. Two 4.8 m lattice extensions give the 110RT its maximum tip height of 79.8 m. Fly extensions on the 110RT are interchangeable with several existing Link-Belt RTC and HTC model.

Dual and single axis controllers are both available on the 110RT, and for high-angle lifts the cab can tilt up to 20 degrees. The five-way-adjustable seat with a headrest ensures a comfortable work environment. The cab also features a large viewing window, minimising blind spots with conveniently located controls and readouts, fine metering and Link-Belt Pulse.

Link-Belt Pulse is a Link-Belt designed, total crane operating system that utilises an in-cab display as a readout and operator interface with on-board diagnostics including the rated capacity limiter, wireless wind speed, boom length and angle, radius of load and crane configuration just to name a few. There are three new lockable storage boxes: two storage boxes are integrated into the deck and one is located between carrier and front outrigger box.

The 110RT camera package enhances on-board site monitoring and includes cameras for viewing to the right side of the upper, the main and auxiliary winch, as well as one for backing up. Another safety feature includes LED viewing lights on all four outrigger beams.

Six points of access to the carrier deck have been maintained on the 110RT. Once on deck, routine checks on powertrain components and fluid levels are a snap with large swing-out doors and LED lighting that reveal the entire engine compartments. A centralised pressure check and grease bank located near the cab allows an operator to monitor multiple pressure and fluid workings from one centralised location. Foldable access ladders and upper guardrails provide reinforced safety boundaries. The 110RT has an overall height of 3.91 m, and it will transport with base unit fully equipped minus modular counterweights at 42 418.1 kg.

In addition, Link-Belt TCC-2500 telescopic crawler crane is equipped with a main boom of 68 m. This 227 t crane is ideal for any general construction, power transmission, wind farm, power industrial or large crane rental fleet. 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. 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.

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.

The TCC-2500's main transport load weighs under 48,000 kg. The crane can be assembled easily and 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. ■

Website: www.linkbelt.com

Gomaco three-track Commander IIIx for extreme radii

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, sensored 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.

Gomaco's three-track Commander III Xtreme has the ability to slipform a 610 mm 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 the Commander IIIx one of the quietest pavers on the market today, said Gomaco. The 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. ■

Website: www.gomaco.com

Tsurumi portable residue drainage pumps

Tsurumi offers a variety of residue drainage pumps, which are capable of draining a small volume of stagnant or residual water. Featuring a compact and lightweight design, these pumps provide excellent portability. They are also easy to handle, having to run on a single-phase power supply.

Several models are available in the product lineup, some of which can drain water to a minimum level of 1 mm, while others are equipped with a water reverse-flow preventing mechanism or a suction attachment. The pumps are suitable for applications such as draining water on the floor of construction sites, pits, water collection/feed tanks and small puddles. This also leads to an additional health benefit: by getting rid of the stagnant water, the pumps help prevent mosquitoes - including disease-carrying mosquitoes - from breeding.

The HSR model starts pumping once the water level is at 5 mm and will carry on until it goes down to 1 mm. According to Tsurumi, although the pump is a single-phase unit, it has the durability equivalent to three-phase drainage pumps as the wear parts are made of abrasion-resistant materials. The pump adopts the side discharge, spiral design. The discharge direction is selectable between vertical and inclined, which prevents folding or bending of the discharge hose.

The LSC model is fitted with a specially designed bottom plate that allows it to drain water down to 1 mm water level. It has a swing check valve that prevents reverse-flow of the sucked water when the pump stops its operation. Like the HSR series, the LSC pump is a single-phase unit with the durability equivalent to three-phase drainage pumps, because the wear parts are made of abrasion-resistant materials. The top discharge, flow-thru design provides maximum motor cooling efficiency, enabling continuous operation at low water levels and extended dry-run capability. The discharge direction is also selectable between vertical and inclined.

Another model is the LSP series, which incorporates a submersible motor. The suction attachment, supplied as standard, allows the pump to drain water down to floor level. The siphon breaker mechanism prevents reverse-flow when the pump stops its operation. Since the LSP model is submersible, there is no problem even if it is submerged in water. The pump also features a flow-thru design for continuous operation at low water levels and extended dry-run capability. ■

Website: www.tsurumi-global.com

All images: Tsurumi portable residue drainage pumps are capable of draining a small volume of stagnant or residual water, making them ideal for use at construction sites. There are several models available, including (from top) the HSR, LSC and LSP series.

FAHH hydraulic impact hammer

The FAHH hydraulic impact hammer from Foundation Associates Engineering (FAE) is capable of driving various piles, including steel tubes, combi piles, 'H' sections and reinforced/prestressed concrete piles. Operated from piling rig leaders or crane suspended, the unit features high impact efficiency, versatility and ease of maintenance.

The proprietary hydraulic circuitry and innovative design support hammer efficiency above 90 percent while maintaining consistent impact energy, said FAE. The use of hammer cushion results in noise reduction and protection of critical components. The unit has an up to 1,200 mm stroke length and maximum blow rate to match the energy requirement of different piles and conditions. Its compact design enables easy setup and handling.

Other highlights of the FAHH hydraulic impact hammer include variable mounting options to cranes, piling machines and excavators; segmental ram weight for various combinations of ram capacity; simple design, modular construction and parts interchangeability for ease of maintenance and to minimise downtime; and timer control to achieve consistent impact energy and improve safety of working conditions. ■

Website: www.fnapl.com

The FAHH hydraulic impact hammer can be used to drive various piles including steel tubes, combi piles, 'H' sections and reinforced/ prestressed concrete piles.

Sennebogen 5500 and 3300 crawler cranes

The Sennebogen 5500 crawler crane has been used in many projects around the world for a variety of tasks, from lifting to assembly of large building elements, as well as for logistics tasks. Equipped with the robust Star Lifter crawler undercarriage, the crane is not only stable but can also be conveniently driven under load. A modular boom design allows for numerous equipment variants with lengths of up to 104 m, including luffing jib.

The crawler tracks can be easily removed for transport, after which the base machine, at just 3 m wide, can be easily transported. All further components can be stowed in containers or tarpaulin-covered trucks in a space-saving way. With its self-assembly system, the crane can be assembled quickly.

As part of the E-series, the 5500 with green efficiency technology also boasts high energy efficiency, thanks to EcoMode, temperature-controlled fan drives and a Sencon control and diagnostics system. The Maxcab comfort cab provides a comfortable operating environment and an optimal overview. The cab can also be tilted by 20 degrees and elevated up to 2.7 m.

The Sennebogen 3300 crawler crane also has a self-assembly system. Its lattice boom is available in numerous designs, from 13.1 to 94 m, thanks to its modular system. Fly boom variants and other attachments, including auxiliary and luffing jibs, offer additional flexibility at the construction site.

The 3300 boasts high energy efficiency, thanks to EcoMode and a Sencon control and diagnostics system. Like the 5500, the Maxcab comfort cab can also be tilted by 20 degrees or elevated up to 2.7 m.

Furthermore, the SENtrack telemetry system now offers owners of Sennebogen material handlers and cranes a way to manage their machinery more easily and with all the key information. The web-based user interface provides a centralised overview of all machinery in use as well as their movements. At the same time, SENtrack is also a tool for maintenance planning and control. For example, live data such as fuel consumption, engine temperature, hydraulic pressure and utilisation rate can be determined wirelessly. The data can also be easily traced over longer periods and the exact position of the machines can be determined on a map via GPS.

In terms of hardware, the SENtrack module consists of a GSM and GPS antenna and a control unit in the uppercarriage of the machine that transmits the data via the cellular network. The user can conveniently access and analyse the data online. In the near future, new machines will have the option of being equipped with the system at the factory, while a retrofit kit is currently available from customer service for existing machines. ■

Website: www.sennebogen.com

Above: The Sennebogen 5500 features a self-assembly system and is highly stable, fitted with the robust Star Lifter crawler undercarriage. Here, the crane is being used by Tiong Seng on a project in Singapore.

Left: The Sennebogen 3300 works on a bridge project in Russia. The crane also has a self-assembly system, and features a lattice boom with numerous designs from 13.1 to 94 m.

Telescopic chute and wear segments from Sandvik

The WE6000i telescopic chute from Sandvik Construction has been designed to prevent the emissions of dust and loss of material, thereby improving operational efficiency and the environment in which it is used. A key feature of the chute that enables it to produce such benefits is that a vacuum is created inside it by the material flow, reducing the requirement for expensive, service demanding filtration systems.

The WE6000i can be used in a variety of areas and applications. It possesses an extremely good ratio between minimum and maximum length, with the number of conical chute segments varying depending on the height of the stockpile and that of the feed conveyor.

The WE6000i can be operated from the control panel, via a PLC with automatic level sensor or manually via remote control. The chute senses its height above the material stockpile and automatically adjusts, minimising the risk of dust emissions. In addition, the wire winches are equipped with limit switches.

Featuring a modular design, the WE6000i allows for a choice of materials to be used in different applications. The construction of the chute segment is optimised for flexibility, long life and material flow. This user-friendly design enables easy maintenance, providing savings for operations wherever it is used.

In addition, Sandvik's HX900 wear material combines the wear resistance of cemented carbide with the shock resistance, ductility and forming capability of nodular iron. This makes an ideal combination resulting in a hard material that stands well in tough environments and has long wear life. The HX900 wear segments are perfect for areas on equipment that are easily worn out.

According to Sandvik, a typical HX900 product has a wear resistance that is comparable with cemented carbide and a strength that is 80-90 percent of the strength of pure nodular iron. The wear resistance is generally 5-15 times higher than with common hardened steel, Ni-hard, hard facing or ceramics.

The HX900 wear segments are ideal for crushers, loader buckets, chutes, excavators, rock box edges, weld on hammer tips, and in all places that are inaccessible for installation of wear liners. In such applications HX900 may easily replace conventional wear resistant steels, castings and hard facing on wear parts subjected to severe stresses, claimed Sandvik.

The HX900 wear segments come in three shapes for flexible and adaptable usage. Firstly, the HX900 wear buttons possess a dome shape that gives maximum protection and minimises the effect of impact. The round shape virtually eliminates any risk of weld crack propagating into the parent metal.

Secondly, the HX900 wear runners protect large areas on bucket bottoms and corners. They provide heavy-duty protection where it is needed, with the wear runners being available in two sizes. Thirdly, the HX900 wear bars make it easy to form a mosaic pattern that counters highly abrasive applications. The mild steel backing plate is notched to allow easy cutting into smaller pieces if required.

Moreover, as the HX900 segments require minimum welding, which can lead to cracking of major structural components, they are an excellent alternative to hard facing, said Sandvik. There is no preheating needed during installation and the rebuild takes about a third as long depending on application. ■

Website: www.construction.sandvik.com

Top and above: The WE6000i telescopic chute has been designed to prevent the emissions of dust and loss of material, thus improving operational efficiency and the environment in which it is used.

Above, left: The HX900 wear segments are ideal for crushers, loader buckets, chutes, excavators, rock box edges, weld on hammer tips, and in all places that are inaccessible for installation of wear liners.

Potain hard at work in Vietnam and the Philippines

Vietnam-based Coteccons Group is using a fleet of Potain tower cranes to carry out some of the country's high-profile construction projects, including Landmark 81 (Vietnam's tallest building), Vinhomes Central Park, The Manor, City Garden, The One and SC Vivo City, all of which are in Ho Chi Minh City; and IndoChina Plaza, D' Capitale, Metropolis and Mandarin Garden in Hanoi.

Coteccons has found the Potain MCT 205 topless cranes to be particularly well suited to its needs and has purchased many of them since the model was launched approximately two years ago. Apart from adding over 20 units of MCT 205, the company has also added three MCR 160 luffing jib cranes. All of them were supplied by Minh Chi Co, Potain's national dealer for Vietnam.

The MCR 160 has a maximum capacity of 10 t and can work with up to 50 m of jib. Its capacity at the jib end is 2.4 t. The crane is well suited to both internal and external climbing, which makes it particularly attractive to contractors in Vietnam and other Asian countries where the internal positioning of tower cranes is increasingly required.

To facilitate this, the crane can be assembled on either 1.6 m or 2 m-wide mast sections. There is a choice of three winches available on the MCR 160, including the 100 LVF 25 Optima, which offers excellent lift ability and reach. The 75 kW-rated unit can hoist 1.25 t loads at speeds of up to 188 m/min, while its 1,270 m rope capacity makes it ideal for tall buildings.

Like the MCR 160, the MCT 205 can also be mounted on either 1.6 m or 2 m mast sections, depending on required configuration on site, and again making it a strong choice for internal climbing applications. Maximum working radius on the MCT 205 is 65 m (when configured on 2 m mast sections), 5 m more than on its predecessor, the MC 205 B. Maximum capacity for the crane is 10 t and its tip capacity when working with its full 65 m jib is 1.75 t.

In addition to the MCT 205 and MCR 160, other Potain cranes in the Coteccons fleet include three MC 85 A units, seven MC 175 B units and four MC 205 B units.

Furthermore, EEI Corporation in the Philippines has started work on a residential development with the help of Potain tower cranes. This new project located within the Bayshore City resort is part of the Entertainment City Manila complex, a grand destination that will serve both local and international visitors.

Above: Potain tower cranes being deployed by Coteccons Group to carry out major construction projects in Vietnam.

Left: EEI Corporation works on a residential development in the Philippines with the help of Potain tower cranes.

EEI selected four Potain cranes to help with construction, including three top-slewing MC 205 B units and one MCR 225 A luffing jib crane. They arrived in February 2016 and are planned to be on site for approximately two years. The cranes will construct eight new buildings and a six-storey parking garage.

Potain's MC 205 B is a 10 t capacity tower crane. It can work with up to 60 m of jib and has been fitted with this full complement for the Bayshore job. Its jib end capacity is 2.4 t. They can achieve line speeds approaching 117 m per minute, and can be used in either two-fall or four-fall reeving with up to 500 m of rope capacity available on the 55 RCS 25 winches that EEI Corporation has selected on its MC 205 B units.

The MCR 225 A has a maximum capacity of 14 t, while its maximum available jib is 55 m and again it is working with this maximum for the Bayshore project. Capacity at the 55 m tip length is 2.15 t. It can be equipped with either a 75 LVF 35 Optima winch or a 100 LVF 35 Optima winch, and the hoist can reach speeds of up to 140 m per minute.

The cranes are working at heights of 30 to 51 m. They all have their full jibs fitted, although EEI has ensured that they don't overlap. The four Potain cranes can cover the whole site, handling building materials and precast concrete sections, said EEI.

EEI Corporation bought the Potain cranes from the local Manitowoc office in the Philippines. The company now has 31 Potain cranes in its fleet, including 15 of the MCR 225 A luffing jib units and seven of the MC 205 B model. However the MC 205 B is no longer in production, having been replaced by the new MCT 205, an improved and updated version of its predecessor. ■

Website: www.manitowoccranes.com

Road paving solution for new flyover in Myanmar

Ammann equipment was recently at work during the construction of a new flyover in Yangon, Myanmar. The structure was built above the area where several roads converge.

Handling the project was Shwe Taung Development Co Ltd, one of Myanmar's leading construction companies. Founded in 1990, Shwe Taung employed more than 6,000 people in 2016. The company owns an Ammann AFT 500 asphalt paver, an AP 240 T2 pneumatic roller, an AV 70 X articulated tandem roller, an ARW 65 walk-behind roller and an ASC 100 soil compactor. Providing the product support was Htun Nay Wun Thitsar, the local Ammann dealer.

The new Tamwe Flyover is a Y-shaped structure that connects several roads and moves traffic above the congested streets below. The flyover is 600 m long, with a cost of US$19.2 million.

The AFT 500 F asphalt paver worked at the width of the flyover road when possible. Only a single lift of asphalt was required. Haul trucks carried 5 t to the jobsite from the plant, which was 4 km away. A tamping and vibratory screed was utilised.

The Screed Assist System helped provide consistency and a level surface. The system is an e-hydraulic device that unloads the weight of the screed, thereby enabling an increase in paving depth. Transferring the weight of the screed onto the rear tracks also improves traction.

The paver worked at a pace of 5 m per minute, even while pulling at the extensive lift. An AV 70 X articulated tandem roller provided breakdown compaction. It typically made between two and four vibratory passes. The AP 240 T2 pneumatic roller made 16 passes during intermediate compaction. The tandem roller then followed with another two to four passes, with no vibration. ■

Website: www.ammann-group.com

Above and bottom: Various Ammann machines were involved in the construction of a new flyover in Yangon, Myanmar.

Bauer technology used on major projects in Abu Dhabi

A new district is being developed in Abu Dhabi, UAE, which will provide homes for 22,000 people. It includes 2,700 apartments, 13 schools, restaurants and parks, covering an overall area of 570 ha. To ensure that the ground can accommodate the loads imposed on it by the planned structures, it must be compacted and its load bearing capacity improved. To carry out this work, Menard Vibro Middle East (Dubai) is relying on a Bauer MC 96 duty-cycle crane. The machine has been developed and rigorously expanded specifically for use as a base carrier for BC trench cutters as well as diaphragm wall grabs.

A precondition for the deployment of the MC machines for dynamic compaction is the advanced winch system with fully automatic control. This innovative technology aims to provide machine efficiency and process optimisation on the construction site. The machine operator simply inputs the required target parameters into the intelligent control system of the machine, such as the degree of compaction and the specified number of impacts. A heavy drop weight or pounder is then dropped repeatedly on the ground from a great height fully automatically and without specific control interventions. The high kinetic energy released on impact penetrates into deeper soil layers and leads to the desired compaction as a result of forced rearrangement of the soil particles.

The high-performance diesel engine and the 35 t winches of the MC 96 duty-cycle crane guarantee short cycle times and maximum productivity, said Bauer. The machine also scores by way of the highest level of stability: the large footprint of the undercarriage, a 45 t counterweight and the robust tubular lattice boom are optimally designed for the extreme load peaks associated with dynamic compaction operations.

Bauer has also been tasked to carry out ground improvement works for an exclusive villa community on Yas Island.

Above and below: A new district is currently under construction in Abu Dhabi to provide homes for 22,000 people. Here, a Bauer MC 96 duty-cyle crane (below) is used for ground compaction.

In another project, Aldar Properties' Yas Acres development will feature a high-end residential villa community with retail buildings, schools, a mosque, leisure facilities and a golf course, located on 638 ha of Yas Island - one of the biggest natural islands in Abu Dhabi. Aldar has commissioned Bauer with the early works on the project. The company will perform ground improvements for the future buildings across an area of 400,000 sq m from the end of October. The scope of works will include earthworks, general site clearance and the relocation of a temporary treatment plant, among others. Bauer's part of the work is expected to take 10 months. ■

Website: www.bauer.de

Rammer overcomes demolition challenges in Australia

Adelaide-based company McMahon Services has carried out a number of complex demolition works at the Adelaide Convention Centre in South Australia. Among them was the deconstruction of the Plenary Building during the first half of 2015; it is to be replaced with a multi-purpose, modern facility with plenary capacity of up to 3,500 seats, scheduled for completion in 2017.

McMahon Services was engaged by the main contractor Lend Lease to undertake this highly complex project. For a successful outcome, a Rammer 777 breaker weighing 385 kg, fitted to a modified Komatsu PC138-8 excavator, was used to demolish the Plenary Building's four circular stair structures, each 8 m in diameter and 13 m high, and the concrete walls up to 250 mm thick.

To reach these stair structures, the excavator was fitted with a 16 m long-reach boom. This required the use of a smaller than usual breaker for this size of carrier to ensure it did not exceed safe working loads. In addition, because the job required the excavator to work on a suspended concrete slab – which also had to be demolished in the course of the project – it was heavily modified with an extended undercarriage system to better spread the weight over the floor area.

The Rammer 777 was supplied by Renex, the Rammer dealer in South Australia. According to Renex, the most critical factor was matching the weight of the breaker to the excavator, taking into account the length of boom, length of tracks and width of the track frame. The PC138-8 is able to have the flows controlled through the ECM as the auxiliary is electronic. Once set, a flow meter is connected to the excavator's auxiliary circuit to ensure accurate delivery of no more than the breaker's requirement of 120 l of oil per minute at 140 bar pressure. ■

Website: www.rammer.com

Both images: The Rammer 777 breaker, fitted to a Komatsu excavator, demolishes the Plenary Building's four circular stair structures and the concrete walls up to 250 mm thick.

Hamm rollers 'race' on Baku F1 track

The Formula 1 (F1) race was held for the first time in Baku, the capital of Azerbaijan, in June 2016. The German circuit planner Hermann Tilke, who had also planned the track in Shanghai in 2004, designed a demanding street circuit with 20 curves, a double chicane and an uphill section. The route leads past centuries-old buildings in the historical city centre, modern skyscrapers and the port on the Caspian Sea. A number of machines from Hamm, Wirtgen and Vögele were involved in the project producing a high-quality asphalt layer in the narrow streets and on the wide boulevards.

All facilities were constructed in the city itself, such as paddock including pit buildings, premises for the teams, a media centre, the medical centre and the grandstand. The largest project was said to be the asphalt paving for the 6,003-km-long track. Here, Azerbaijani general contractor AzVirt LLC installed binder and surface courses over an area of 113,000 sq m.

Wirtgen large milling machines were used, equipped with fine milling tools and 3D control, to create a surface with a defined profile to the highest standard of precision. However, such effort was difficult to do along the old city walls; this is where centuries-old cobblestone pavement is to be found, which should be left undamaged by the race as it forms part of UNESCO world cultural heritage. In view of that, the asphalt consultant Dr Rainer Hart developed a special solution including carbon-reinforced asphalt.

The highlight of the work was the hot-to-hot installation in front of the beach promenade, where seven of the eight Super 1900-2 pavers and 15 Hamm tandem rollers built a 52-m-wide area in a single operation. The tandem rollers comprised the HD, HD+ and HD CompactLine series. For good visibility, the HD+ series features a panoramic cabin, and the HD CompactLine rollers come with a 'wasp-waist' front section for an optimum overview of the working area.

The Hamm rollers also have an excellent side clearance. It enabled high-quality compaction along the many kerbs, fixtures and walls, right to the edge. In the process, the drivers also appreciated the large track offset of the articulated rollers that made it easy to achieve precise compaction of the edges.

In addition, the oscillation technology contributed to the high-quality compaction. This technology involves dynamic compaction that directs only few vibrations into the ground around the roller. This was crucial here, because the track is lined with many historic buildings and below the carriageway there are underground carparks and subways. Therefore, in most areas, conventional compaction with vibration was forbidden. The special movement of the oscillating drum produces very flat surfaces, with good initial skid resistance. With the oscillation technology, AzVirt said it was able to meet the requirements of 3 mm on a 4-m-long straight edge. ■

Website: www.hamm.eu

Above: Hot-to-hot installation with Super 1900-2 pavers from Vögele, followed by Hamm rollers.

Below: Hamm rollers work on a narrow street .

Bottom: The Baku F1 route passes through centuries-old buildings in the historical city centre, modern skyscrapers and the port on the Caspian Sea.

Haulotte helps build Louvre museum in Abu Dhabi

Haulotte has played a role in the construction of Louvre museum in Abu Dhabi, UAE. When completed, this new landmark will showcase works of historical, cultural and sociological significance from ancient times to the contemporary era.

The Haulotte machines on the project were supplied by United Gulf Equipment (UGER), most of which included diesel articulated and telescopic big booms. The newly upgraded Haulotte HA41RTJ Pro has a maximum outreach of 19.80 m and fast lifting speed of less than 40 seconds. The HA20RTJ features high productivity, comfort and safety. It has an ergonomic and spacious designed platform, as well as fully proportional, simultaneous controls for greater accuracy and smoothness of movement. This allows an optimal performance while the machine is working on the installation of the stars of the complex geometric pattern of the dome, whereas the H25TPX was ideal for reaching the most difficult working areas and thus increasing time efficiency and productivity. ■

Website: www.haulotte.com

Above and left: Haulotte aerial platforms have been used in the construction of Louvre museum in Abu Dhabi. Supplied by United Gulf Equipment (UGER), most of them comprised diesel articulated and telescopic big booms.

Liebherr machines deliver productivity in Dubai projects

Dutco Balfour Beatty (DBB) is currently using Liebherr machines to carry out piling work at Expo Village in Dubai, UAE. One of them is a 100 t capacity Liebherr HS 8100 HD duty cycle crawler crane, which has been modified to help boost productivity on the job.

The machine is using its engine power to drive the vibro hammer that installs pile casing. According to DBB, compared to the conventional two separate equipment of vibro hammer and crane set up, this modified HS 8100 HD crane has led to an improved productivity on the job by 20 percent.

Two 50 t-capacity HS 8050 HD cranes are used to install the steel cages, and a fourth Liebherr unit, an LR 1130 crawler crane with a 137 t maximum load capacity, is also on site.

DBB has six months to complete the piling and foundation work for its contract, but the company said it is well ahead of schedule and expects to complete the job within four and a half months. DBB also said that this is the first time such modification has been used in the UAE.

Rotary drills are being used to bore the holes, with the Liebherr units driving the casing and then placing the steel rebar cage, in one length, into the hole. The contract requires 1,900 piles, ranging in depth between 15 m and 26 m, and with diameters of 1,000 mm, 900 mm and 750 mm. The soil is sand for the first 4 m, with mixed rock of varying hardness below that, and a water table nearly 7 m below the surface.

DBB is working on a 24-hour cycle, and its highest rate of pile installation has been 43 piles during one cycle, said the company. Using this configuration, DBB believes it is saving up to six minutes per pile.

In addition, a Liebherr LB 20 rig is used by UAE-based Delta Foundations to drill 200 piles in four months, for a four-star hotel at Dubai's Culture Village development.

Culture Village is a mixed development located alongside Dubai Creek, where a 6 km boardwalk and a marina have been constructed. Plots of land have been allocated to a number of developers for the construction of apartment buildings, hotels, retail space, offices, a mosque and a museum.

The basement excavation for the four-star hotel has already been completed, and a diaphragm wall constructed around the perimeter. Delta Foundations was awarded a contract for the driving of 200 bored piles underneath the basement level.

Above and left: Dutco Balfour Beatty uses four Liebherr machines to carry out piling operations at Expo Village in Dubai. Among them is a Liebherr HS 8100 HD duty cycle crawler crane, which has been modified to help increase productivity on the job.

Left: Delta Foundations deploys its Liebherr LB 20 rig to drill 200 piles for a four-star hotel at Dubai's Culture Village development.

The LB 20 rig is being used in a rotary Kelly configuration, with a casing oscillator. Delta is driving two depths of pile, one to 24 m and the other to 29 m, depending on the needs of the structure. There are two diameters of pile, one at 70 cm and the other at 100 cm.

The LB 20 works at a maximum torque of 230 kNm, which allows for a fast drilling cycle, and with a Kelly drilling configuration it can reach a depth of 52 m. ■

Website: www.liebherr.com

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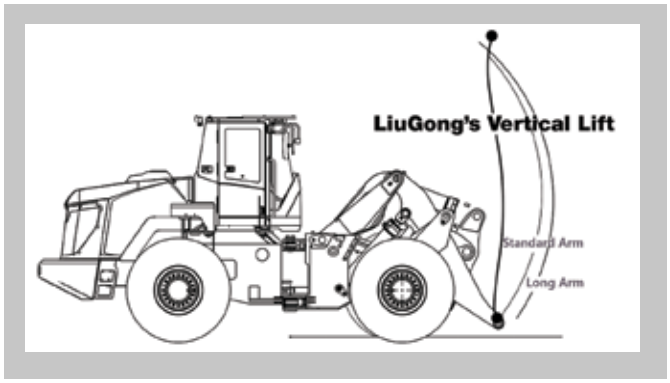
LIUGONG GOES VERTICAL

LIUGONG RECENTLY UNVEILED ITS LATEST INNOVATION, THE VERTICAL LIFT (VL) WHEEL LOADER, SETTING A NEW STANDARD IN THE GLOBAL CONSTRUCTION EQUIPMENT INDUSTRY. SOUTHEAST ASIA CONSTRUCTION HAD A CHANCE TO MEET UP WITH THE LEAD ENGINEER BEHIND THIS REVOLUTIONARY PRODUCT.



The vertical lift wheel loader provides a higher lift height and heavier tipping load than conventional wheel loaders of the same power and weight.

The key features of this new innovative machine are the vertical lift loader arm on an articulating frame and the mechanical self-levelling Z-bar bucket linkage on a vertical lift loader - both are industry firsts, said LiuGong.

"This technology will create a new class of the machines. We are proud to say that we were the first to develop and will be the first to market the vertical lift articulating frame wheel loader," said Edward Wagner, LiuGong's director of New Technology and Test, inventor and lead engineer of the new VL wheel loader.

There are currently two models available - the VL80A for regulated countries is fitted with a Tier 4f Cummins engine, and the VL81A for non-regulated countries is powered by a Tier 3 Cummins engine. The machines have a rated load of 8.0 t (VL80A) and 8.1 t (VL81A), full turn tipping load of 16,000 kg (VL80A) and 16,200 kg (VL81A), operating weight of 19,793 kg, dump reach of 1,381 mm, dump height of 3,500 mm, and bucket size of 4.2 cu m.

Cost-efficient machine

The vertical lift was developed as an innovative way to improve the performance of the machine, thus adding value for customers. The technology accentuates the wheel loader's primary function - lifting and carrying a load - by providing a heavier tipping load and higher lift height than conventional wheel loaders of the same power and weight, explained Mr Wagner. "For example, our standard 856H wheel loader with a long arm has a tipping load of 11,020 kg, while the VL model is around 16,000 kg.

"If you compare the VL and standard wheel loaders, taking into account their initial purchase price and the benefits each can offer, you'll find that the VL machine is more cost-efficient.

"This gives our customers a winning preposition, particularly those in the developing markets. And for customers in the developed markets, the VL wheel loader also provides lower operating costs."

Fuel costs will be cut down as well, added Mr Wagner, as the VL machine has a reduced operating weight and in turn allows more tons material to be moved per horsepower, compared to a conventional radial lift machine. As a result, this enables customers to move more tons per hour for lower initial investment, and lower owning

Left: Edward Wagner, LiuGong's director of New Technology and Test, is the inventor and lead engineer of the new VL wheel loader.

Below: The machine was launched in November 2016 during LiuGong's global annual dealer conference in China.

LiuGong's key innovations include the vertical lift loader arm on an articulating frame and the mechanical self-levelling Z-bar bucket linkage on a vertical lift loader - both are said to be industry firsts.

Mr Wagner together with Zeng Guang'an, chairman of LiuGong (centre) and David Beatenbough, LiuGong's vice president for R&D.

Compared to conventional radial lift wheel loaders such as the 856H (left), the VL wheel loader (above) is more fuel-efficient as it allows more tons material to be moved per horsepower.

and operating costs than would be required with conventional technology.

"The vertical lift technology is universally applicable and it is especially suitable for stockpiling and truck loading applications with advantages in efficiency and performance," continued Mr Wagner.

Another highlight is that the VL wheel loader shares its basic technology with all other LiuGong wheel loaders. "The VL machine is simple, purely mechanical – no electronics involved," said Mr Wagner. "The engine, cooling system, cab, electrical systems, hydraulics and driveline are all common with our radial lift wheel loaders. There will be very few new service parts."

The importance of talent

The idea of vertical lift technology for wheel loaders was first generated in 2010 and then started and further developed in 2011, according to LiuGong. 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 this year. "We hope our customers can put their new VL loaders to work by this year," said Mr Wagner.

"Wheel loaders are at the heart of LiuGong – that's why we pushed it to be the first that features such technology. And if these two models are successful, we may introduce more models in the near future," added Mr Wagner. He also mentioned that the vertical lift technology was inspired by that of a skid steer loader. "We believe the technology used in skid steers can be applied to wheel loaders, but it wasn't easy to implement.

"The development process took a long time as we faced a complexity. Apart from conducting a lot of research, we had to find the right talent in the industry. We've got to build quite a few things to prepare for this!"

Zeng Guang'an, chairman of LiuGong, further highlighted the importance of talent to drive the company's innovations. "During downturn, we must invest heavily in R&D and upgrade our products to increase their value, and thereby increasing our market share. Otherwise, we wouldn't be able to survive in the current economic climate.

"We should really care about the value of our products and adapting to new technologies, rather than focusing only on the cost of the products."

"However, successful innovations call for the right mix of talent," stressed Mr Zeng. "In the past 10 years, we have introduced talents from around the world, not just from China, and we are constantly on the lookout for engineers. Diversity is our long-term view and is important to our success – we have to embrace it!" ■

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The Contract T206 section involves the construction of tunnels between Woodlands Station and Woodlands South Station, and also tunnels between Woodlands South Station and crossover tunnels adjacent to Woodlands Ave 12.

THOMSON-EAST COAST LINE CONTRACT T206

In view of land scarcity, Singapore is maximising the use of underground space to expand its rail network across the country. Among the latest projects is the Thomson-East Coast Line (TEL), which is currently under construction and scheduled to open in stages from 2019. Southeast Asia Construction recently visited one of the sections, Contract T206, to take a closer look at the tunnelling work.

The 43 km TEL is fully underground, combining the Thomson Line and Eastern Region Line. It will add 31 new stations to the existing rail network, with seven interchange stations linking to the East-West Line, North-South Line, North-East Line, Circle Line and Downtown Line.

The 30 km Thomson Line will enhance rail connectivity in the north-south corridors to the Central Business District (CBD) and developments in the Marina Bay area. It consists of 22 stations, including six interchange stations: Woodlands, Caldecott, Stevens, Orchard, Outram Park and Marina Bay. These interchange stations will link to the North-South-East-West Line, Downtown Line, North-East Line and Circle Line.

The 13 km East Coast stretch of the TEL will connect commuters living in the eastern parts of Singapore - including those in Tanjong Rhu, Marine Parade and Bedok South - to the heart of the city. This stretch will have nine stations, comprising one interchange station with the Downtown Line 3 Extension at Sungei Bedok.

Contract T206 is one of the civil contracts awarded to Shanghai

Top and above: One of the slurry TBMs in operation.

Tunnel Engineering Co Ltd (STEC) in 2013. Costing around S$421 million, it involves the construction of twin bored tunnels between Woodlands Station and Woodlands South Station, plus twin bored tunnels between Woodlands South Station and crossover tunnels adjacent to Woodlands Ave 12.

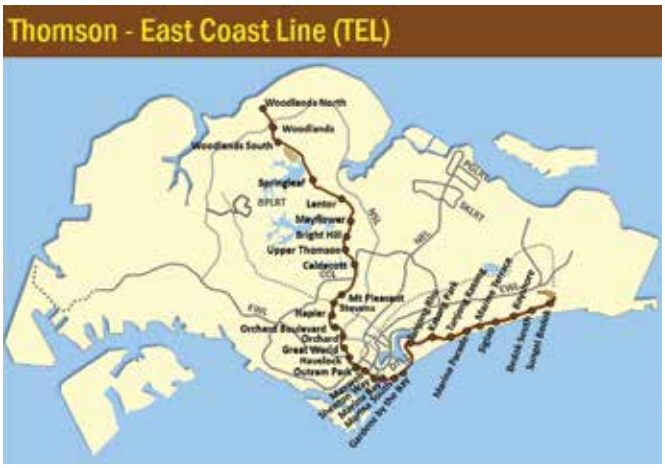
It also includes tunnels linking Woodlands station to the Mandai depot. The total length of the bored tunnels in Contract T206 is about 6.2 km, featuring approximately 550 m of cut and cover tunnel.

According to the Land Transport of Authority (LTA), tunnelling work started in October 2015 and is expected to be completed in 2017.

Continued overleaf…

Above and left: The tunnel linings are made of steel fibre reinforced concrete (above), making them more durable and fire-resistant.

Aswinikumar Shashikant Jadhav, LTA's deputy project manager for TEL Civil Team 1, provides an overview of the project.



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The 43 km TEL is expected to be completed in stages from 2019. It combines the Thomson Line and Eastern Region Line, adding 31 new stations to the existing rail network.

Difficult ground conditions

"One of the challenges we've faced is dealing with difficult ground conditions, such as Bukit Timah granite along the Changi and Woodlands bound tracks, which contain mainly boulders," said Aswinikumar Shashikant Jadhav, LTA's deputy project manager for TEL Civil Team 1. "The other tracks, on the other hand, are predominantly soils."

With such mixed ground conditions, LTA decided to employ both slurry and EPB (Earth Pressure Balance) tunnel boring machines (TBMs). In total, there are two slurry and three EPB TBMs.

"The slurry TBM is excellent for granite, rocky ground with high water pressure, while the EPB is suitable for soft ground like soils, with lower water pressure," explained Mr Jadhav.

The slurry TBMs, supplied by German manufacturer Herrenknecht, has a diameter of 6,600 mm, a drive power of 1,440 kW and a maximum thrust force of 45,000 kN. The EPBs were supplied by the main contractor, STEC, featuring a drive power of 1,056 kW and a maximum thrust force of 39,000 kN. These EPB machines also have a diameter of 6,600 mm.

The five TBMs will go through a length of 6.2 km, divided into 10 drives. The two slurry TBMs will cover 2.4 km and the three EPBs 3.8 km. Mr Jadhav said that on average, the EPBs could reach up to 10 m a day and the slurry TBMs up to 6 m a day in Contract T206.

Steel fibre reinforced concrete

For the first time on the TEL project, steel fibre reinforced concrete (SFRC) is being used for the tunnel linings - a method that is considered "new" in Singapore, according to LTA. The SFRC incorporates 7+1 segments, compared to the 5+1 segments using the traditional reinforced concrete (RC) method.

The use of SFRC makes the tunnel "more fire resistant and highly durable," said Mr Jadhav. LTA also mentioned that there is a plan to apply SFRC in Contract 207, another TEL civil contract that will build Thomson Line tunnels from Seletar Expressway/Woodlands Avenue 12 to Springleaf Station. ■

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When completed, the Signature Tower will be a new architectural landmark in Kuala Lumpur, Malaysia.

The building is currently under construction.

SIGNATURE TOWER

Scheduled for completion in late 2018, the Signature Tower in Kuala Lumpur, Malaysia, will soar 439 m into the sky. The building is believed to be one of the tallest in Asia and rank among the world's top 15. It is under construction in the city's new Tun Razak Exchange district, which when finished will occupy some 13,877 sq m. The district is planned to become Malaysia's new international finance and banking centre.

The Signature Tower was designed by Mulia Group Architects. The building tapers continuously as it rises. It is topped by a 48 m high illuminated crown made of special glass, so that in the dusk and at night time this skyscraper will stand out.

The owner of the project is Indonesia's Mulia Group, which has planned the structure with 92 floors primarily as office space. The individual floors average 3,100 sq m in size and there are no interior columns. Main contractor on the project is China State Construction Engineering Corporation. The construction work started in the first quarter of 2016.

Doka is playing a role in the project. The company has developed a practical formwork and safety concept adapted to the tight construction schedule and the customer's high safety requirements.

Formwork solution

Doka was involved in the project by supplying its formwork systems. The core of the building is made of reinforced concrete and the floor slabs are of steel-composite design. Doka has developed a practical formwork and safety concept adapted to the tight construction schedule and the customer's high safety requirements.

"Mulia's Signature Tower project is a fast-track super high-rise building, and as such we felt it was important to have a reliable partner on board with both international and local expertise. Doka's climbing formwork system for the core along with on-site instruction for formwork assembly and operator training allow us to confidently cycle floor to floor at a rate of four days with the greatest efficiency and assurance of high quality," said Corey Suckling, project engineer of Mulia Property Development.

Doka's SKE100 plus automatic climbing formwork has a rising working platform, which provides access for quick and easy operation of the form ties.

On this project the building core is exceptionally large and is being built with Doka's automatic climbing formwork systems, the SKE100 plus and SKE50 plus. With a lifting capacity of 10 metric tons per climbing unit, the SKE100 plus is suitable for the structure of the building core and the high ratio of reinforcing material. The automatic climbing systems are combined with Top 50 large-area formwork to give the concrete its shape.

The Top 50 formwork is suspended on rollers, so forming times are fast and stripping paths large. Changing form-facings is a complex job, so for this project the formwork was faced with Xlife sheets and fitted with steel corners, permitting high numbers of re-use cycles.

The SKE100 plus has rising working platforms. In other words, the formwork and the reinforcing operations are decoupled, so work proceeds on a number of different levels at once. All the forming work is done on the main working platform. Other working platforms are integrated above and below. They are for the jobs of installing the reinforcement, pouring the concrete, operating the climbing system, finishing the concrete and installing connectors for the steel composite floor slabs. All these jobs proceed in parallel, so progress on the project is faster and construction time is shorter, said Doka. What's more, the SKE100 plus has plenty of storage place for reinforcing materials, so the site crew has everything ready on hand, added the company.

Another highlight of the project is that the building core is divided into two sections with multiple shafts. So the entire climbing scaffold on the outside of a core section can climb quickly and safely in a single repositioning operation. No apertures occur during climbing, so no construction materials or gear can fall from the platforms. Alternate repositioning of the sections of the building core speeds up construction to a tremendous extent.

"We have to stick to a four-day cycle, so everything has to be coordinated. All the influencing factors have to interact seamlessly: fast repositioning of the climbing system, ample storage space for the reinforcement and different jobs going ahead all at the same time. The crew splits into parallel teams for working the formwork, placing the reinforcement, pouring the concrete and doing the various finishing jobs. The timing is all-important," stressed Andhi Irawan, senior sales manager of Doka Malaysia.

While working out the details of the formwork solution, Doka was planning for optimum usage of the cranes on the inside and outside of the building core. The cranes integrate seamlessly into the formwork concept. The concrete placing boom system is also repositioned with the SKE100 plus.

The Signature Tower will have a steel skeleton facade. The Doka Xclimb 60 protection screen with trapezoidal metal sheeting provides all-round protection during construction. A special feature of the variable enclosure is that it has integrated safety nets on the outside. All the work connected with the reinforcement, the formwork and the pouring of the concrete carries on inside the protection screen. The steelwork and the welding work proceed above the protection screen. The nets catch tools and small items if they are dropped. This solution was designed specifically for the high safety requirements on the Signature Tower development. According to Doka, this will be the first time the nets have been used on a project anywhere in the world.

The working platforms on the SKE100 plus also have all-round trapezoidal metal sheeting enclosures to protect the crew from falling and from adverse weather conditions. In addition, built-in stairs, instead of ladders, in the main pathways interconnect the working levels in the building core and further boost the standard of safety on the site. ■

Website: www.doka.com

Unless stated otherwise, all images courtesy of Doka.

Scheduled for completion in late 2018, the Signature Tower will be 439 m high. The building is believed to be one of the tallest in Asia and rank among the world's top 15.

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Istanbul's new airport is being built in four phases.

ISTANBUL NEW AIRPORT

The Istanbul New Airport in Turkey is being built on a 7,650-ha site in four phases. Scheduled for completion in 2028, it is set to be the largest airport in the world. The construction cost of the project is estimated at over €10 billion.

The floor area of the main terminal alone is 130 ha and the concrete amount needed for the terminal building is around 1,000,000 cu m. In mid-2016, there were approximately 13,000 people and 2,000 construction machines working on the site at one time. The construction of the project started in mid-2014 and the first phase is due to be completed in 2018, after which the airport will be able to accommodate up to 90 million passengers per year.

The construction of additional take-off and landing runways and another terminal by the end of 2022 will mark the end of the second and third phases. Upon completion of the fourth phase, up to 3,500 flights are expected to be cleared for taking off and landing on a total of six runways, linking Istanbul to more than 350 destinations worldwide. This represents a total capacity of up to 200 million passengers every year.

Lifting solution

Liebherr is playing a major role in the project. The company has delivered a total of 58 tower cranes to carry out a variety of lifting tasks. These cranes include the 154 EC H, 280 EC H and 200 EC H models. The order was supplied through the company's subsidiary in Turkey, Liebherr Makine Ticaret Servis Limited Şirketi.

"As a result of our long term, close collaboration with the contractors involved, we were able to provide the required technical consultancy services for the customer right from the start," said Danyel Temizkan, managing director of Liebherr Makine Ticaret Servis Limited Şirketi.

"The clarification of the technical requirements, enhancing the site organisation by selecting the right equipment and the coordination of commercial modalities were all coordinated by our highly qualified staff in co-operation with their counterparts at the manufacturing plant in Biberach, the headquarters of Liebherr's Tower Cranes Division."

Mr Temizkan continued, "We also provided support for the logistics, customs clearance and tax matters. This expertise and our ability to act at a local level enabled us to handle the project using the methods preferred by the customer.

"We can ensure the maximum availability of all the cranes by having five fitters permanently stationed on the site. In addition, to coincide with the delivery of the first tower crane, we established a spare parts warehouse specially compiled for the crane types in use and stationed this warehouse on the site. This enables us to minimise the delivery times for spare parts."

Above: Work on the project started in mid-2014, with the first phase due to be completed in 2018. The construction of additional take-off and landing runways and another terminal by the end of 2022 will mark the end of the second and third phases.

Below: Built on a 7,650 ha site, the Istanbul New Airport is planned to be the largest airport in the world when fully completed in 2028.

Above and left:
Liebherr has delivered a total of 58 tower cranes for the project, which will be used for a variety of lifting tasks. The cranes include the 154 EC H, 280 EC H and 200 EC H models.

"A great deal of expertise is required for such major project, in order to show how to use tower cranes most efficiently and economically," added Dominique Tasch, managing director for sales at Liebherr-Werk Biberach GmbH. "Our Tower Crane Solutions Department initially researched the relevant information relating to the complete infrastructure and the planned building complexes. The complete crane fleet was then planned on the basis of this building structure."

According to Liebherr, the time frame for the negotiations was also challenging. The company started the negotiations in March 2015 and was able to accept the order in mid-May 2015. The first tower cranes had to be delivered at the end of June 2015 and the last one on 21 December 2015.

Liebherr has been active in Turkey for decades. Before its local subsidiary was founded, the company dealt with local agents and direct with relevant manufacturing plants. Due to the increasing importance of the Turkish market, Liebherr opened its own sales and service company based in Istanbul eight years ago. It also has another office in Ankara. ■

Website: www.liebherr.com

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QUEEN MAXIMA BRIDGE

Above and top right: Crossing the Old Rhine River at Alphen aan den Rijn, in the Netherlands, the new Queen Maxima Bridge features a balanced tail bridge design, where the tails contain counterweights to ensure smooth opening and closing of bridge segments, allowing tall vessels to pass through.

Crossing the Old Rhine River at Alphen aan den Rijn, in the Netherlands, the new Queen Maxima Bridge features a balanced tail bridge design, where the tails contain counterweights that ensure smooth opening and closing of bridge segments, allowing tall vessels to pass through. During the bridge's construction, industrial contractor Hollandia Infra commissioned the heavy lifting and engineering transport specialist, The Sarens Group, to lift and position the two main balanced tail bridge segments weighing in excess of 280 t from barges on the Old Rhine River.

Complex lifting

"We knew there would be much planning and we would need a high capacity crane to successfully complete this heavy lifting project," said Robin van Oss, project engineer of Sarens.

Adding to the complexity was a narrow navigation channel through which barges carrying Sarens' specialised lifting equipment had to pass. The required crane and supporting equipment would enter the river at Dordrecht, and navigate nearly 50 km upstream to the bridge project site spanning the Old Rhine River. "The top challenge for working on water was the narrow, 11.4-m wide passage in some parts," said Mr van Oss.

With its track length just narrowly fitting channel requirements for Sarens, the Demag CC 3800-1 lattice boom crawler crane offered the right combination of compact footprint and heavy lift capacity required for this job.

Sarens invested many months planning for the challenging lift. Because the hoists would take place from barges, the crane equipment needed to remain stationary on the floating bases, while tugboats and mooring lines did all the manoeuvring. "The plan was to rig and position the CC 3800-1 crane in the correct set-up on the barges, and the crane would be used like a sheerleg," said Mr van Oss.

In addition to the Demag crane, Sarens' plan called for a 100-t capacity mobile crane for lift support, a twin barge configuration and strand jacks. Sarens' Sarspin device – with its four hydraulic levelling cylinders and up to 600-t capacity – would also be integral in helping the CC 3800-1 crane to position the pivoting bridge segments.

To handle the 230- and 280-t weight of the two bridge segments, Sarens required the 650-t Demag crane to be configured with its Superlift structure to increase crane capacity. Accommodating the 11.4-m canal width in some areas and crane positioning on the floating base, "we had to install the crane on one barge and the Superlift tray with counterweight on the other," explained Mr van Oss. "The crane's tracks were to be positioned perpendicular to the length of the barge, so its 11.3-m track tip-to-tip length narrowly passed through the channel."

Left: During the bridge's construction, Sarens was tasked by Hollandia Infra to lift and position the two main balanced tail bridge segments weighing in excess of 280 t from barges on the Old Rhine River. The company used a Demag CC 3800-1 crawler crane to complete the job.

Below: The massive 30.7-m-long bridge segments required LSL_2 configuration with 60 m of main boom for the CC 3800-1 crane and 36 m Superlift mast. The 165 t counterweight on the crane's superstructure, 50 t central ballast and 325 t on Superlift tray were necessary to give the crane a 347-t capacity when working at the predetermined fixed 24-m radius.

The massive 30.7-m-long bridge segments required LSL_2 configuration with 60 m of main boom for the CC 3800-1 crane and 36 m Superlift mast. The 165 t counterweight on the crane's superstructure, 50 t central ballast and 325 t on Superlift tray were necessary to give the crane a 347-t capacity when working at the predetermined fixed 24-m radius.

"We planned every lift detail and prepared for every possible contingency for about six months prior to the project start date," said Mr van Oss. In early July 2016, Sarens was able to put all of those preparations into action. The CC 3800-1 was shipped directly from the Zweibrücken plant in Germany to the mobilisation site in Dordrecht.

Sarens' 10-person crew had the crane rigged with the main boom, Superlift mast and full counterweight within three days. The car body was manoeuvred onto the first barge, while the Superlift tray and maximum counterweight was positioned on the second. Both barges navigated the narrow channel passageway independently of each other.

Once reaching the Queen Maxima Bridge destination, Sarens connected the two barges together and the Superlift counterweight tray to the crane. While a tugboat positioned the two barges carrying the lifting equipment, a separate vessel positioned the enormous balance trap type tail bridge main segment, upended on its wings, next to the crane barge.

Sarens chose to position the west side bridge traffic lanes first. The company used ballasting on the crane barge to slowly hoist the tail bridge segment and transfer weight from the transport barge. "The bridge's eccentric centre of gravity challenged our work crew, but they used our Sarspin device to flip and rotate the bridge segment into its final position for connection to the rest of the bridge," said Mr van Oss. "When you work on water, you have a number of challenges to face – wind, weather, waves and weight transfer – and we faced it all on this job."

It took just short of four hours to lift the west side bridge segment to height and another two hours for moving the crane barges and load into installation position. Within a final three hours, Sarens attached the pivoting segment of the bridge to complete the first lift. The entire process was completed in one long day.

The two crane equipment barges were then split apart and repositioned on the east side of the Queen Maxima Bridge. Attachment of the second moveable bridge segment went as smoothly as the first. Within two weeks, segment installation was complete and Sarens mobilised the barges with lifting equipment back to Dordrecht for derigging. ■

Website: www.terex.com/cranes

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EJPOVICE TUNNEL

Work on the Ejpovice tunnel in the Czech Republic is currently underway. The tunnel is a key element of the Rokycany-Pilsen railway line, which forms part of the trans-European transport network and the national Third Railway Transit Corridor, which runs all the way to the German border.

Once completed – scheduled in 2018 – it is estimated to take less than one hour to travel from Prague to Pilsen, and the trains will be able to travel at speeds of 120-160 km/hr. At present, it takes around one and a half hours to travel between the two cities.

The modernisation of the Rokycany-Pilsen line is part of the national railway development in the Czech Republic. The project also fits into the concept of trans-European transport network by the European Commission and complies with the requirements for interoperability of the European railway network.

The construction of Ejpovice tunnel is expected to help improve the safety of

Top and above: The construction of Ejpovice tunnel in the Czech Republic is in full swing. The tunnel is a key element of the Rokycany-Pilsen railway line, which forms part of the trans-European transport network and the national Third Railway Transit Corridor, which runs all the way to the German border.

railway operations. The project involved the construction of two parallel single-track tunnels, each has a 9.89 m diameter with a length of 4,150 m. These tunnels were bored using a tunnel boring machine (TBM) named Victoria, which weighs 1,800 t and is 114 m long, with a diameter of 10 m. The machine has a rotating head that allows tunnels to be bored and then lined with segmented concrete rings, completely automatically, through both hard rocks and softer ground, or below aquifers.

According to the original schedule planned by the designers of the tunnel, the TBM should have completed digging operations in November 2015, but during tunnelling operations it encountered unexpected problems due to geological conditions of the ground. The TBM was then disassembled and refurbished and transported to the town of Kyšice, where it started to dig the second tube of the tunnel.

Quality admixtures

Mapei UTT (Underground Technology Team) cooperated closely with the contractor to select the most appropriate chemical

The tunnel excavation was carried out using a TBM named Victoria. The machine is 114 m long and weighs 1,800 t, with a 10 m diameter. It has a rotating head that allows tunnels to be bored and then lined with segmented concrete rings, completely automatically, through both hard rocks and softer ground, or below aquifers.

Continued overleaf...

products for ground conditioning and find out their ideal application method. The process included several laboratory tests conducted at the Polytechnic University of Turin, Italy, and then directly on the building site. The soil at the tunnel face is generally conditioned with the injection of Polyfoamer FP/CC liquid foaming agent, with its parameters constantly adapted to the changeable geological conditions.

In some tunnel sections the conditions were particularly complex, with the presence of huge amounts of water at the tunnel face, which required other measures than just using the foaming agent. In these sections Mapedrill M1 synthetic polymer in liquid form, fully compatible with the foaming agent used, was injected into the excavation chamber of the TBM. This polymer is able to improve the muck consistency immediately, thus allowing its extraction by means of the screw conveyor. The use of this polymer allowed the contractor to significantly increase the efficiency of TBM, improving the speed of the excavation works and reducing the time loss due to production breaks.

One of the TBM boring method characteristics is to build the lining using precast reinforced concrete elements in the shield. The diameter of the shield is always larger than the outer diameter of the tunnel lining ring. Therefore, cavities between the lining and the soil arise naturally during the boring and it is necessary to fill them by injection.

Mapequick CBS System, a two-component system for cement-based mixes for injection, has been chosen for the Ejpovice tunnel. It is a system made up of Mapequick CBS System 1 liquid retarding agent, which during the application phase is mixed with the Mapequick CBS System 2 liquid activator admixture, resulting in a quick set of the mix.

Defoamer XP liquid defoaming agent was used in this building site to get rid of the foam during its release to the machine or on the surface. In addition, Mapequick AFK 889 alkali-free accelerator for sprayed concrete was used during smaller additional boring works such as in the entrance and access pits. ■

Website: www.mapei.com.sg

Top and left: Mapei UTT (Underground Technology Team) cooperated closely with the contractor to choose the most appropriate chemical products for ground conditioning and find out their ideal application method.

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WANDA METROPOLITANO

The Wanda Metropolitano stadium in Madrid, Spain, has been under construction since 2011 and when completed, it will be the new home for Club Atlético de Madrid, one of Spanish football clubs. Replacing the Vicente Calderón Stadium, the new stadium will have additional facilities as well as a bigger capacity of approximately 68,000 spectators, around 13,000 more than the Vicente Calderón Stadium.

Building new stands

Five Linden Comansa cranes, owned by Gruymsa (Grúas y Maquinaria SA), have been used on the project to prepare the foundations and build new stands. Gruymsa is an official dealer of Linden Comansa and one of the main tower crane rental companies in Spain. The five cranes installed on site were rented to the construction company FCC, including three units of LC2074 and two units of 21LC290, all of which feature a maximum load capacity of 12 t.

Gruymsa began the erection of the cranes in July 2013, but due to the site's proximity to the Adolfo Suárez Madrid-Barajas International Airport, the cranes could not be installed with their final height until a special permission from AESA - the Spanish Aviation Safety

Images on facing page, above and left:
Work on the new Wanda Metropolitano stadium in Madrid, Spain, is progressing well and when completed, it will be the new home for Club Atlético de Madrid, replacing the Vicente Calderón Stadium.

and Security Agency - was granted. Upon approval, Gruymsa successfully climbed the cranes to their final heights, the shortest being 52.1 m tall and the highest 69.6 m.

Four of the Linden Comansa cranes from Gruymsa, plus two other tower cranes from FCC's machinery park that also worked on the project, have now completed their job at the stadium. A Linden Comansa 21LC290 is currently the only tower crane that remains at the venue, but is planned to be removed in the upcoming weeks. After that, FCC will start to build the stadium roof.

Gruymsa owns a rental fleet of more than 250 Linden Comansa tower cranes and has been involved in some of Madrid's major projects, such as the Torre de Cristal tower, the airport's Terminal 4, the expansion of the Reina Sofía Museum, the refurbishment of the Prado Museum, and the construction of multinationals' headquarters like Telefónica or BBVA. Gruymsa offers a full range of cranes and services, including preliminary studies, technical consultancy, maintenance tasks and crane erections, among others. ■

Website: www.comansa.com

Top, above right and right: Five Linden Comansa cranes have been used on the project to prepare the foundations and build new stands. They included three units of LC2074 and two units of 21LC290, all of which have a maximum load capacity of 12 t.

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BAUMA CHINA 'STILL PLAYS LEADING ROLE' IN ASIA

The eighth edition of bauma China was held between 22 and 25 November 2016 at the Shanghai New International Expo Centre (SNIEC), attracting more than 170,000 visitors from 149 countries and regions.

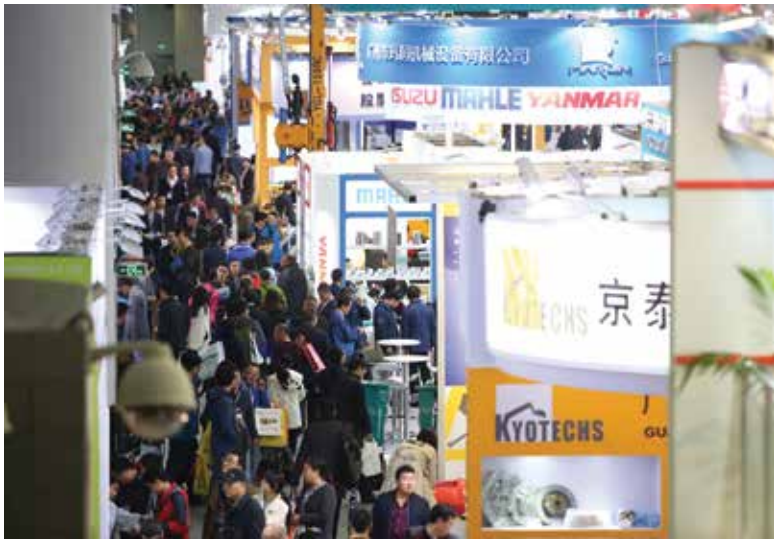
"With 14 years of development, bauma China once again underlines its leading role in Asia. It has provided participants with good opportunities for industry communication and exploring product innovations, market trends and possible solutions despite the current uncertain situation," said Stefan Rummel, managing director of Messe München, the show organiser.

"The success of the exhibition reflects the confidence of the exhibitors worldwide towards the Chinese economy as well as the world economy. It is beneficial to the faster, healthier growth of the construction machinery industry," added Jun Qi, chairman of China Construction Machinery Association.

After China, the top 10 visitor countries and regions abroad were: Korea, Russia, Malaysia, Thailand, India, Japan, Singapore, Taiwan, Indonesia and Australia - in that order.

"This year (2016) the results are really good. Apart from domestic customers, we made contacts with clients from overseas markets like Australia, Korea, Thailand, Singapore, Malaysia, Dubai and Russia, and received many orders," said Michael Minsky, group marketing manager of Far East of Bauer Equipment (Shanghai) Limited.

Jing Chen, director of the president office, Sany Heavy Industry, also commented, "bauma China is the most important



All images: Scenes from bauma China 2016.

exhibition to us. There are a lot of visitors this year. Visits to our booth have far exceeded our expectations."

bauma China 2016 covered an exhibition area of 300,000 sq m and drew 2,953 exhibitors from 41 countries and regions, 70 percent of which came from China. According to the organiser, there were about 45 percent new exhibitors and in particular, many large shield machine manufacturers participated for the first time.

"This is the first time we have taken part as an exhibitor. bauma China is a wonderful platform for exhibition and communication. We are satisfied with the results," said Hongwei Tu, senior brand manager of brand publicity department, China Railway Construction Heavy Industry Co Ltd.

Exhibitors from outside China also made good use of this event to showcase their innovations and advanced technologies. The 2016 bauma China featured seven national pavilions from Germany, Italy, Korea, Spain, Turkey, the UK and the USA.

The next bauma China is scheduled to take place at the Shanghai New International Expo Centre from 27 to 30 November 2018. ■

Website: www.bauma-china.com

POTAIN

The new Potain MCR 295 luffing jib crane from Manitowoc will be sold in Asia Pacific, Middle Eastern, African and Latin American countries. It is available in three variations, each with its own rated capacity and load chart. The MCR 295 H16 has a 16 t maximum capacity; the MCR 295 H20 has a 20 t maximum capacity; and the MCR 295 H25 has a 25 t maximum capacity. All three include a lengthy 60 m maximum jib.

The MCR 295 is the largest luffing jib crane from Manitowoc's manufacturing facility in Zhangjiagang, China, and it has been developed in close coordination with the Potain Centre of Excellence in France. The crane is ideal for jobsites with tight working quarters, featuring a compact 2 m x 2 m footprint and the optional Top Tracing II anti-collision system. Owners can choose from a variety of winch options, all with Potain's variable frequency drive technology that offers smoother acceleration and closer control.

Winch options for the MCR 295 are: the 75 LVF 40 Optima or the 100 LVF 40 Optima on the 16 t version; the 100 LVF Optima 50 or the 150 LVF 50 GH Optima/180 LVF 50 GH Optima (depending on power supply) on the 20 t version; and the 100 LVF 63 Optima or the 150 LVF 63 GH Optima/180 LVF 63 GH Optima (depending on power supply) for the 25 t version.

Manitowoc has also unveiled the prototype of MCH 120 topless luffing jib crane, which is still in development. The company said it will release further details on this new crane in due course. ■

Potain MCR 295 luffing jib tower crane.

ALIMAK HEK

Alimak Hek has upgraded two of its construction hoist models, the Alimak SC 65/32 and SC 45/30. They feature an upgraded door design and enhanced drive unit technology to ensure safety and improve productivity and reliability.

The company also introduced the latest design in tower crane lifting technology, the Alimak TCL, which is designed for installation on the majority of existing tower crane systems. According to Alimak Hek, this new lift offers simple external installation, the ability to retrofit with little to no mast modification, as well as comfortable and reliable access for crane operators, technicians and maintenance personnel.

In addition, Alimak Hek's HEK MC 450 is the next generation of strong, robust and quality mast climbing work platforms, which is suitable for global use in the light and medium range of applications. ■

Above and below: Alimak Hek has upgraded two of its construction hoist models, with an upgraded door design and enhanced drive unit technology for improved safety and productivity.

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XCMG

XCMG displayed various types of machines, including an eight-axle all-terrain crane, electric drive dump trucks, graders and excavators, to name a few. The company also launched several new products, like a new milling machine, the S9 platform concrete equipment, the SQS625 telescopic loader crane and the XR550D rotary drilling rig.

One of the highlights was the XS263JS single drum vibratory road roller, which is designed for use in applications such as road, railway, airport and water conservation projects. The machine is powered by an SC8D high-pressure, common-rail, water-cooled diesel engine, which meets the National III emission standards. ■

Right: A variety of XCMG machines at bauma China 2016.

MTU

MTU showcased a variety of engines for the construction and industrial (C&I) applications, including the Series 900, Series 1500, Series 2000, in addition to the associated exhaust after-treatment system. The MTU brand is part of Rolls-Royce Power Systems.

With engines ready for existent EPA Tier 4 markets, MTU will cooperate with Daimler to further develop the MTU 1000 – 1500 Series based on Daimler commercial vehicles, making them compliant with the forthcoming EU Stage V emission regulation. With power outputs from 100 to 480 kW MTU engines meet the new EU Stage V emission limits, which will also apply to soot particles, by using advanced internal engine technology, an SCR exhaust gas after-treatment system and an additional diesel particulate filter.

In regard to varying emissions standards around the globe MTU also presented the Emission Flex Package, an innovative solution enabling customers to operate engines in countries where different emission requirements apply. Engine systems that to date have been developed solely for markets with stringent emission regulations with exhaust gas after-treatment, can now be operated outside these highly regulated markets as well and create value to transfer those machines possibly to those countries where different emission regulations apply. Customers will benefit from this new feature as it allows to sell the vehicle in numerous countries without changing or modifying the vehicle, which usually results in high costs and time-consuming procedures.

The Emission Flex Package will be offered as a retrofit solution for Series 900, 460 and 500 engines based on Mercedes-Benz classic engine series, designed to meet China 3, EU Stage IIIB and Tier 4 interim. For new engines, the Emission Flex Package is planned for EU Stage IV and Tier 4. This means that MTU provides engines for all areas of application within the construction industry that need to meet very different emission requirements.

MTU offers a wide range of engines for the construction and industrial applications.

For above 500 kW there are MTU's Series 1600 engines, which are available for the 567 to 736 kW power range. In addition to complying with the US EPA Tier 4 emission regulations, they are also designed to meet the future EU Stage V regulations using internal engine technology. No exhaust aftertreatment is required.

MTU's 12-cylinder Series 2000 engines for installation in construction and mining equipment cover a power range extending from 567 to 1,163 kW and are available for EPA Tier 4 interim emission regulations. For Series 2000, it has been planned to obtain the China 4 certification by 2017.

Furthermore, MTU offers 12, 16 and 20-cylinder Series 4000 models with power outputs extending to 3,000 kW. They meet the China 3 certification and also US EPA Tier 4 emission regulations with no exhaust gas aftertreatment, depending on the engine model. ■

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MANITOU

Manitou showcased its various all-terrain handling machines, including the MTX-732 and MTX-1840 telescopic handlers, the MRT-X 2150 rotative telescopic handler, and the 100 VJR, 170 AETJL and 200 ATJ aerial platforms. The company's Gehl and Mustang brands were represented respectively by the R165 and 4000V compact loaders.

Having had a presence in Asia for many years, Manitou was able to increase its market share in 2016 (compared to 2015), said the company. It is also planning a dedicated logistics centre reorganised in Singapore from the first quarter of 2017, in order to supply spare parts to customers in the Asia Pacific region as quickly as possible. The aim is to guarantee a 90 percent availability rate, said Manitou. Another important investment is the new Manitou Centre in Malaysia opened last year.

The leasing market in China continues to show strong growth with an annual growth rate estimated at almost 20 percent for the last five years, according to Manitou. The company said it is well positioned for this customer segment, having consolidated its partnerships with major market players during the construction of Disneyland Shanghai.

Manitou showcases its all-terrain handling machines.

Manitou's network of distributors is also increasing its coverage with the recent arrival of Gateway in China, bringing the number of dealerships in Asia for Gehl and Mustang compact loaders to 15. This is expected to help the company gain further market share in the construction sector.

In addition, to support growth and respond effectively to market needs, Manitou China has moved its premises to Min Hand District, Shanghai. The new facility provides a larger surface area to store machines, with a dedicated training area. ■

SDLG

SDLG unveiled its largest motor grader, the G9260. Suitable for mining and large-scale infrastructure projects, the machine can handle a variety of tasks such as land grading, ditching, bulldozing, slope scraping and snow removal work. This new model is planned to be sold in China in early 2018.

Powered by a Tier 3 SD13 engine, the G9260 motor grader features optimised weight distribution, a 136 kN tractive force and is equipped with a hydraulically powered wet brake system. The electronically controlled engine matches perfectly with the power shift transmission control valve and the mechanical transmission system, achieving optimum performance and fuel efficiency. The double fuel tanks in the G9260 ensure high driving force and reliability.

With an 825 mm maximum cutting depth, the blade of the grader is 4.27 m wide and the cutter diameter is 1,626 mm. The

SDLG's largest motor grader, the G9260.

G9260 has a forward and reverse speed of 44.2 km/hr and 31.8 km/hr respectively. The cab features the latest generation of operator safety and comfort, including a new falling-object and rollover protection structure (FOPS/ROPS). The electric-hydraulic locking mechanism also ensures safe and convenient operation. ■

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BAUER

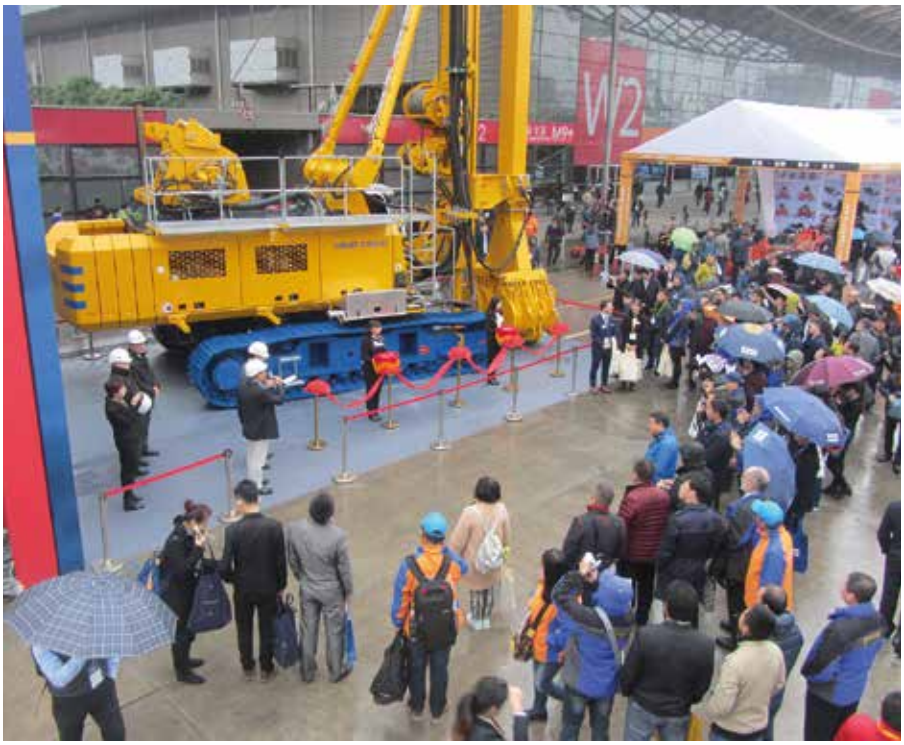
Bauer's CSM 35 rig is ideal for the Asian market, and it is now attached to a Bauer BS 80 BB base carrier. The rig's drive has torque of 100 kNm, and in combination with the flipper tooth developed by Bauer, it can be used even in difficult soils. With a 35 m mixing depth, the device is dimensioned for standard foundation engineering requirements. Its robust, torsion-resistant rectangular kelly bar with locking recesses means that it can undertake precision work to the highest levels of accuracy.

Bauer's hydraulic GB 50 grab is an updated model of the GB 46. The new GB 50 features numerous improvements, such as the increase in motor power from 224 to 261 kW, and in pulling force from 46 to 50 t. The BT 70 base carrier not only meets the latest requirements in the health, safety and environmental protection fields, but it is also innovative fitted with the pull-out service platforms. These service platforms are stored as extendable, walk-on drawers on the underside of the support in order to save space. When the platform is extended, the working area underneath the upper carriage is released so that the component units can be easily reached from the ground.

The free-fall system incorporated into the hoists enables the grabs to be used effectively in difficult soils. It is the first unit of its class to provide the option of a Cat Tier 4 diesel engine. Another associated development is the new DHG V grab unit, the prototype of which was unveiled at bauma China 2014. It is specifically designed for use in free-fall mode, and it can be used effectively despite its minimised weight. And thanks to its minimised weight, it can also be used in combination with smaller base carriers. With its GB 40, GB 50 and GB 60 series, Bauer has a portfolio that can tackle any upcoming projects in the market.

Bauer's BG 30 drill rig, one of the models in the ValueLine series, is specifically designed for drilling with a kelly. The machine combines excellent drilling performance at depths of up to 87 m and diameters of 2,500 mm. It is also equipped with an integrated service platform that allows for easy, convenient and secure access for all types of maintenance work on the uppercarriage.

The BG 30 produces excellent torque, combined with low diesel consumption levels. Its optional single-layer piggyback winch enables the winch pulling force to be kept constant, even at great drilling depths, and cable wear to be dramatically reduced.



In addition, Klemm Bohrtechnik GmbH is the specialist within Bauer for developing high-quality and powerful drilling rigs with a total weight of up to 32 t. The company's KR 805-2 drilling rig – produced in Tianjin since 2015 especially for the Chinese market – is powered by a Deutz diesel engine with 129 kW. The machine shows high performance in the fields of anchoring, micro-pile and geothermal drilling applications. Furthermore, drilling depths up to 250 m can be reached.

With a width of 2.3 m and a weight of approximately 14 t, the Klemm rig is easy to transport by container or truck. The specially constructed motor housing allows easy access for maintenance and service tasks. The rig is equipped with an optimised kinematic mast-to-boom link, which offers a large range of slewing and mast positioning possibilities. Load sensing technology in the hydraulic system enables an adaptation to the various consumer variations, such as hydraulic drifter, rotary head or double head drilling unit; crane, magazine or winch; flushing pumps etc.

The KR 805-2 can be equipped with drill masts either with cylinder or gear feed systems and the possibility of fitting lattice mast extensions. There are several upgrade possibilities including the use of rod magazines available. The rig is also available as a radio-remote controlled version. ■

Top: Bauer CSM 35 rig.
Above: Klemm KR 805-2 rig.

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BOMAG

Among Bomag's latest products was the BM1000/35 cold planer. To deliver maximum productivity, the machine has a milling drum with optimised geometry, exchange tool holders with low resistance profile and smart material transportation. The machine features a fully vibration insulated workstation for comfortable, fatigue-free working, plus a swivel seat for a perfect view to the milling edge and over the entire site.

The excellent utilisation of torque and power means higher productivity, reduced consumption and less wear. For mobility and extended reach, the planer is equipped with a conveyor belt that can be pivoted by 45 degrees to the left and right. With the BMS 15 interchangeable holder system, a complete change of tool holders requires only about 25 percent of the time needed with conventional systems, said Bomag.

Bomag's BW 226DH-5 single drum roller is fitted with the two-circuit drive system (one hydraulic pump for each axle) for excellent gradeability. The engine features Ecomode, resulting in up to 30 percent less fuel consumption. The cabin has a large glass window for improved visibility and safety on the jobsite; all controls and displays are in one operation panel.

Bomag's RS500 recycler features a hydrostatic rotor drive with hydrostatic overload protection, and also variable rotor speeds that are adjustable during operation. The machine can operate close to slopes and in dam constructions by sliding the rotor to the right or to the left side.

The RS500 incorporates the Flexmix technology with stepless and adjustable graduation bar. The height adjustable ROPS/FOPS cabin has a slidable and turnable seat, plus excellent visibility and additional camera monitoring as standard. The use of BSR 05 tool holder can lead to 30 percent reduction in fuel consumption, less downtime and ease of maintenance for the operator.

Bomag's BF 800 paver features the S300M high-performance mechanical screed, with a maximum paving width of 10.5 m. With the Magmalife aluminium heating plates, heating can be ready for operation three times faster than conventional systems, according to Bomag. The quick coupling technology allows screed extension to be performed easily. This results in shorter retrofitting times and significant cost reductions. The Ecomode has an active engine and hydraulics management system, which saves up to 20 percent fuel, greatly reduces noise and has a lower negative impact on the environment.

Bomag BM1000/35 cold planer (right) and BF 800 paver (below).

The BF 800 is also fitted with the Bomag Sideview system, and therefore the entire control stand can be shifted to the left and right with a maximum overhang of 60 cm.

In addition, Bomag's intelligent compaction system, the Asphalt Manager, is simple to use. With the automatic mode, the system provides more compaction energy selection from easy to tough asphalt mix. For special applications like bridge compaction and similar vibration sensitive jobsites, the operators can choose the bridge compaction mode. With the prof. mode, it allows contractors to set Evib values according to the materials the machine compacts and also asphalt surface temperature.

Bomag's TanGO oscillation system is used wherever sensitive compaction is required. The drum cannot bounce, because the system always works tangentially to the surface. The unbalanced masses in TanGO are right at the edge, and greater leverage means the eccentric weights can be smaller, said Bomag. Another highlight is that the system is maintenance-free, thanks to oil lubricated bearings. ■

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SKYJACK

Skyjack's SJ30 ARJE articulating boom made its debut in the Asian market. It is the company's first electric boom, and also the first boom to feature a rotating jib and to have a direct electric AC drive. The direct electric AC wheel motors provide an optimised drive, combining efficient duty cycle performance with 35 percent gradeability. Ideal for tight spaces, the SJ30 ARJE comes in at just 1.19 m wide, with a working height of 11 m, up-and-over clearance of 3.99 m, inside turning radius of 1.52 m and maximum weight capacity of 227 kg.

In addition, the Skyjack SJIII 4740 DC is the tallest electric scissor lift in the company's range. It has a 13.8 m working height and a 227 kg maximum weight capacity. Skyjack has designed the machine's steering system to offer an impressive turning radius of 0.54 m and single location emergency lowering. The SJIII 4740 DC was designed in response to an increasing demand for larger electric scissors in industrial operations, said Skyjack.

The SJIII 4740 is also Skyjack's widest DC electric scissor at 1.19 m. The machine is equipped with variable speed front wheel hydraulic drive for 25 percent gradeability, as well as a 0.9 m rollout extension deck.

Although certain components of the SJIII 4740 have been completely redesigned, the machine still contains the same commonality of parts features and service-friendly components that span the entire Skyjack range. The bolted cross braces make the Skyjack SJIII 4740 scissor lift extremely rigid and reliable, even when working at full height. Emergency lowering has been designed to be user-friendly with a simple, single location push-and-pull system that is fast and efficient. Battery life has also been upgraded with a motor controller, ensuring increased controllability and reduced recharging time.

Skyjack's full bauma China lineup included the SJ16 vertical mast lift; SJ30 ARJE and SJ63 AJ articulating boom lifts; SJIII 3219, SJIII 4632 and SJIII 4740 DC electric scissor lifts; and SJ8841 RT rough terrain scissor lifts.

All Skyjack machines are created around the company's 'Simply Reliable' philosophy, designed to provide rental companies and end users easy maintenance and service solutions, while increasing their return on investment. ■

SJ30 ARJE articulating boom.

SJIII 4740 DC electric scissor lift.

WIRTGEN

Wirtgen W 50 H and W 55 H small milling machines can be used in various applications. They combine the high milling output of a 50 cm milling machine with the extreme manoeuvrability of the W 35 DC, which is particularly popular in Asia, said the company. They are also the ideal complement to the product range of Wirtgen W 100 H and W 130 H small milling machines, the new W 215 large milling machine and the W 1900 and W 2000 models.

Equipped with an 82 kW diesel engine, the W 50 H and W 55 H can achieve milling depths of up to 180 mm at a working width of 500 mm. The newly developed milling drum with highly wear-resistant tool holder results in a long service life, while additional cutters in the edge area of the milling drum deliver a clean cut edge and a perfect milling result. To optimise the range of applications of the small milling machines and enable the milled material to be loaded directly where necessary, the W 55 H is also equipped with a long loading conveyor.

In addition, the robust design of the milling drum gearbox helps to ensure reliable, effective operation in the tough environment of the jobsite. And the excellent accessibility of all maintenance and inspection points reduces the time needed for maintenance to a minimum.

The W 50 H and W 55 H boast the tried-and-tested operating concept that supports the machine operator in every working situation. The display, for instance, located in the direct line of sight of the operator, indicates the key machine parameters clearly and visibly. The complete lighting of the operator's stand and the controls means that even working in the dark does not pose a problem, especially as the optimally arranged spotlights ensure that the entire surroundings of the machine are well illuminated. The unobscured view of the milled edge, the right-hand side plate and toward the rear also ensures that the machine can be used safely and appropriately on the jobsite. A weather canopy on the W 55 H provides additional protection against the elements.

Furthermore, a large locking angle to either side allows extremely small turning radii that are a particular boon when working on confined sites. The short wheelbase also helps give the small milling machines maximum manoeuvrability. The standard four-wheel version offers optimum stability, manoeuvrability and traction. The machine is available with an all-wheel drive as an option – for maximum traction in difficult jobsite situations and when loading.

Other highlights include hydraulic height adjustment in two speeds at the rear crawler units for high productivity as well as the rear right support wheel, which can be swiveled mechanically in front of the milling drum when milling along curbs. The high driving speed of up to 8 km/hr allows a greater tempo and fast job processing. The W 50 H and W 55 H can be moved speedily between jobsite locations, enabling contractors to respond flexibly to fast-changing requirements. ■

Top and above: Wirtgen W 55 H small milling machine.

COMANSA CM

The CML190 is the first model in CML series of luffing-jib cranes from Comansa CM, a subsidiary of Spain-based manufacturer Linden Comansa. The company said more models will be launched in the following months.

The CML190 features two versions of maximum load capacity (12 t and 18 t), both with a maximum reach of 60 m and different jib configurations every 5 m. This luffer, as well as the upcoming new models, have been designed based on a modular system. Therefore, every component of the crane is light and compact to enable easy transportation and fast erection. Furthermore, the hoisting and luffing cables come pre-installed from the factory for quicker installation of the crane.

The hoist mechanism is placed at the front of the slewing part, resulting in an increased drum capacity and reduced counter-jib radius. There are different hoist winch options, to achieve maximum hoist speeds of up to 178 m/min and drum capacity for up to 1,280 m of wire rope. All hoisting, slewing and luffing movements are frequency controlled for smooth and precise manoeuvres.

The new CML cranes are equipped with a control system popularly known as 'Level Luffing', which allows electronic coordination between the luffing and hoisting mechanisms. A hydraulic push and retention system enables a smooth luffing movement of the jib. The speed of the luffing movement changes depending on the jib angle to ensure a fine approach of the load. Both hoist and luffing movements allow microspeed mode for an optimal positioning control. The luffing drive includes a double brake system to boost safety.

The two versions of CML190 have a jib-end load of 1,550 kg and freestanding height of 64.4 m. According to Comansa CM, these cranes will be available for customers in Asia, Oceania and the Middle East. They are particularly suitable for countries such as Thailand, South Korea and Malaysia, where there are many high-rise construction projects and demand of luffing-jib tower cranes is increasing, explained the company. Comansa CM also said that the exhibited model at bauma China has been sold to a Thailand dealer, Smart (1994) Ltd.

Another highlight from Comansa CM includes the CM1600 series of flat-top tower cranes. These new models are available since September 2016 and have a maximum load capacity of 10 t or 12 t. In addition, Linden Comansa will soon introduce its new LCL700 luffing-jib crane. This will be the company's biggest luffer and will come in two versions of maximum load capacity, 50 t and 64 t. They are planned to be available worldwide from March 2017. ■

Top and left: Comansa CM's CML190 luffing-jib tower crane.

AMMANN

Ammann's ASC 150 D T3 soil compactor offers high compaction output and can make quick work of thick layers in minimal passes. The machine's no-rear-axle concept provides excellent manoeuvrability as well as stability in difficult underfoot conditions. Ammann's proprietary intelligent compaction systems (ACE^{pro} and ACE^{force}) are available to provide further efficiency on the jobsite.

The AV 110 X T2 tandem roller features the articulated steering concept, providing high manoeuvrability on jobsites. The standard differential lock enhances traction and increases surface coverage and quality. The ACE^{force} system is available as well.

The ARX 23 T4i tandem roller uses compact machine design to provide stability, manoeuvrability and access to tough-to-reach jobsites. The articulation joint with oscillation increases surface coverage and quality; crab mode further increases coverage. The ACE^{pro} and ACE^{force} systems are also available.

The ARX 40 T4i tandem roller offers the same key benefits as the ARX 23, but at a larger size. It is typically put to work on projects where more productivity is needed and space is not as tight. The ARX 40 has a drum width of 1,300 mm, compared to 1,000 mm for the ARX 23. The ARX 40 is heavier, too, with an operating weight of 4,125 kg versus 2,250 kg for the ARX 23.

The AP 240 T2 pneumatic tyred roller features an innovative ballasting system that enables the weight of the machine to be properly matched for the jobsite. The weight can also be quickly added or removed based on changing conditions. Operators can adjust tyre pressures from the cab with the help of the air-on-run system. Also essential to the tyred rollers are front isostatic axles with oscillation, which help deliver optimal traction, surface coverage and quality.

Ammann light tandem rollers deliver compaction power in small packages. The weight of the machines ranges from 1,475 to 4,325 kg, while drum widths vary from 820 to 1,380 mm. The rollers are manoeuvrable and offer great visibility, making them ideal for applications in tight areas. They are also designed and engineered for easy operation, including the location of controls, an easy-to-see operator display, drive levers, visibility and simple adjustment of amplitude and frequency. Reduced vibration to the cab means less operator fatigue – and more force applied to the compaction target.

Ammann AP 240 T2 pneumatic tyred roller (above) and ARX 40 light tandem roller (below).

Ammann's vibratory plates have three categories. One of them is the APF series, which is the lightest of all Ammann plate compactors, with weights ranging from 54 to 110 kg. These forward-moving vibratory plates are available in a variety of sizes to fit the application and working space. The exciter system is easy to maintain and has a long life expectancy.

The APR reversible vibratory plates vibrate with a twin-shaft exciter unit. The shaft positioning enables the operator to smoothly change directions (forward/reverse) or to effortlessly keep the machine working on a single, tough-to-compact area. This series can overcome grades between 30 and 35 percent, depending on the model.

The APH fully hydrostatic reversible vibratory plates, the largest offered, feature a triple-shaft exciter system. This makes the machines easier to operate while increasing the power and compaction forces. The system keeps plate movement consistent, which in turn enables smooth travel – even through heavy, cohesive soils – and helps effortlessly overcome steep grades. The APH machines can also climb while backfilling saturated areas. ■

HAULOTTE

The global launch of Haulotte HT28 telescopic boom took place at bauma China 2016. The machine is suitable for a variety of sectors including the construction, shipyard, mining and landscaping industries. It is designed to move easily across all terrains, fitted with an oscillating axle for superior ground adhesion, hydraulic differential wheel lock that effectively distributes power to the wheels, high ground clearance to get over obstacles, and gradeability of up to 45 percent.

Equipped with a Kubota engine, the HT28 also produces up to 20 percent less noise, allowing operators to work in more sensitive areas such as hospitals, schools and office buildings. The model is the first to feature Haulotte's new ultra-high-performance lighting system – the Activ'Lighting Safe Load. Located at several points around the machine, this system illuminates operator controls and the area around the boom to allow users to safely carry out manoeuvres. Integrated into the upper control box cover is a new and improved version of the Haulotte Activ'Shield Bar, a secondary guarding system that protects operators from falling objects.

The HT28 is equipped with the new Activ'Screen on-board diagnostic system, a comprehensive tool that provides full information on machine settings, maintenance alerts, service intervals, causes of failures, and procedures to resolve malfunctions. This makes both troubleshooting and daily maintenance operations as easy as possible. Furthermore, the HT28 comes with a universal telematics connector as standard, which enables it to be integrated seamlessly into any equipment fleet.

The HT28 contains many features that maximise productivity. Simultaneous movements allow the telescopic boom to quickly extend to its full height, reducing the time needed to reach a work area. With a maximum outreach of nearly 24 m, operators can be confident of reaching even the most inaccessible work areas.

To address customer needs for greater load capacity, the HT28 includes a 350 kg dual load capacity option. On this mode, the platform can accommodate an additional 40 percent of equipment by weight, eliminating the problem of operators not being able to always load all their equipment at once.

A common problem when working at height is that machine engines can run continually for no reason, resulting in unnecessary hours being recorded on the hour meter. The HT28 offers a solution – the STOP Emission System that automatically stops and restarts the engine. As a result, engine and peripheral component use is reduced by up to 20 percent, which extends engine life and decreases fuel consumption. In the long run, operating costs are lowered and a higher residual value assured.

Above and below: Haulotte HT28 telescopic boom.

The HT28 incorporates the latest design standards that ensures robustness and high durability to maintain a greater resale value – the upper control box is shielded by a highly resilient protective housing, a weighing system that does not come into contact with the ground, and steering rods that are located within the frame, which shields them from impact. In addition, the modular, easily dismantled design of the platform and cover means that operators need only replace the damaged part rather than the entire assembly. ■

LIEBHERR

Liebherr's 300 t LTM 1300-6.2 mobile crane features a 78 m telescopic boom. Its 12.5 - 21 m double folding jib can be extended by two additional 7 m sections to a total of 35 m. The folding jib can be erected at an angle of 0°, 20° or 40°, or as an option can be adjusted hydraulically between 0° and 40° while fully loaded. The 5.5 m foot section of the folding jib can be used as a heavyweight erection jib and provides a considerable load capacity of 58 t.

The luffing lattice jib can be erected in steps of 3.5 m up to a height of 70 m. The 14 - 42 m fixed jib also has 3.5 m modules, helping to improve its load capacity. The fixed jib can also be erected on its own (without an auxiliary crane).

The 300 t crane is powered by a single engine with a mechanical shaft. This ensures a high efficiency level and low engine speeds in the chassis engine provide sufficient power for crane work. The eight-cylinder Liebherr diesel engine develops 450 kW at 1,900 rpm and torque of 2,856 Nm at 1,500 rpm. The power is transferred to the crane axles via the 12-speed ZF-TC-Tronic gearbox.

The LTM 1300-6.2 is also fitted with pneumatic disc brakes. Compared to drum brakes, not only do disc brakes provide better braking performance but are also more economical since the brake pads can be replaced more quickly and easily and they also offer a longer service life, said Liebherr.

The four rear axles on the six-axle chassis have active electro-hydraulic steering depending on the vehicle speed. This increases the manoeuvrability of the vehicle and drastically reduces tyre wear. At crab steering speed all six axles are steered, meaning there is no need to raise any axles.

The LTM 1300-6.2 features the Liebherr Liccon2 crane controller. An add-on programme has been developed for the new crane drive concept with just one engine and a mechanical shaft to allow the machine to be run with low fuel consumption. This enables the complete pump drive to be automatically disconnected when the engine is idling, and then reconnected by the intelligent controller in a matter of seconds when it is required.

A mobile, multifunctional control and display unit, the 'BTT' Bluetooth terminal, is provided for setup functions, allowing the crane to be jacked easily and safely. The crane driver also has the option of attaching and removing the hook block on the crane bumper with visual contact, by controlling the hoist winch and the luffing cylinder of the telescopic boom remotely via the Bluetooth connection. The BTT is also used for other setup functions such as ballast assembly and for mounting the folding jib and the second hoist winch on the new LTM 1300-6.2.

Liebherr LTM 1300-6.2 mobile crane (above) and R 920 crawler excavator (below).

In addition, Liebherr's new crawler excavator model series, fitted with Stage IIIA/Tier 3/China III engines, is designed for less regulated markets such as Russia, India, China, Southeast Asia and South Africa.

One of the models displayed, the R 920, is a 21-t machine ideal for use in earthmoving, digging and drainage/sewerage work and has an output of 110 kW. The concept of the machine is based on European standards and aims to improve reliability and productivity on the construction site, with lower fuel consumption.

Besides the R 920, the other models include the R 922 and R 924, with operating weights of 22 t and 24 t respectively and outputs of 110 kW and 125 kW.

Liebherr has enhanced the comfort for the driver in the new series. For instance, the R 920 has newly designed seats, a 7-in touch screen and larger windows. This gives the driver a better view of the working environment and thus increasing work safety. The optimised Positive Control hydraulic system makes the combined movements of the machine even more fluid, which increases the breakout forces and breakaway torques.

A 110 kW Cummins diesel engine drives the R 920. The six-cylinder common rail system is also compatible with diesel with high sulphur content or with biodiesel B20. The robust travel mechanism, the optimised Liebherr 'Z' tooth system for attachments, and the optional backhoe bucket in a heavy-duty version, also ensure long and efficient use of the new crawler excavator. ■

GENIE

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 was 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 SX-135XC telescopic boom lift.

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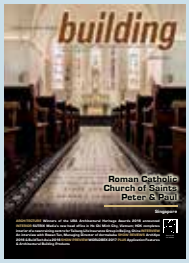

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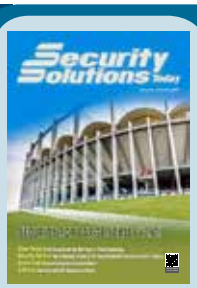

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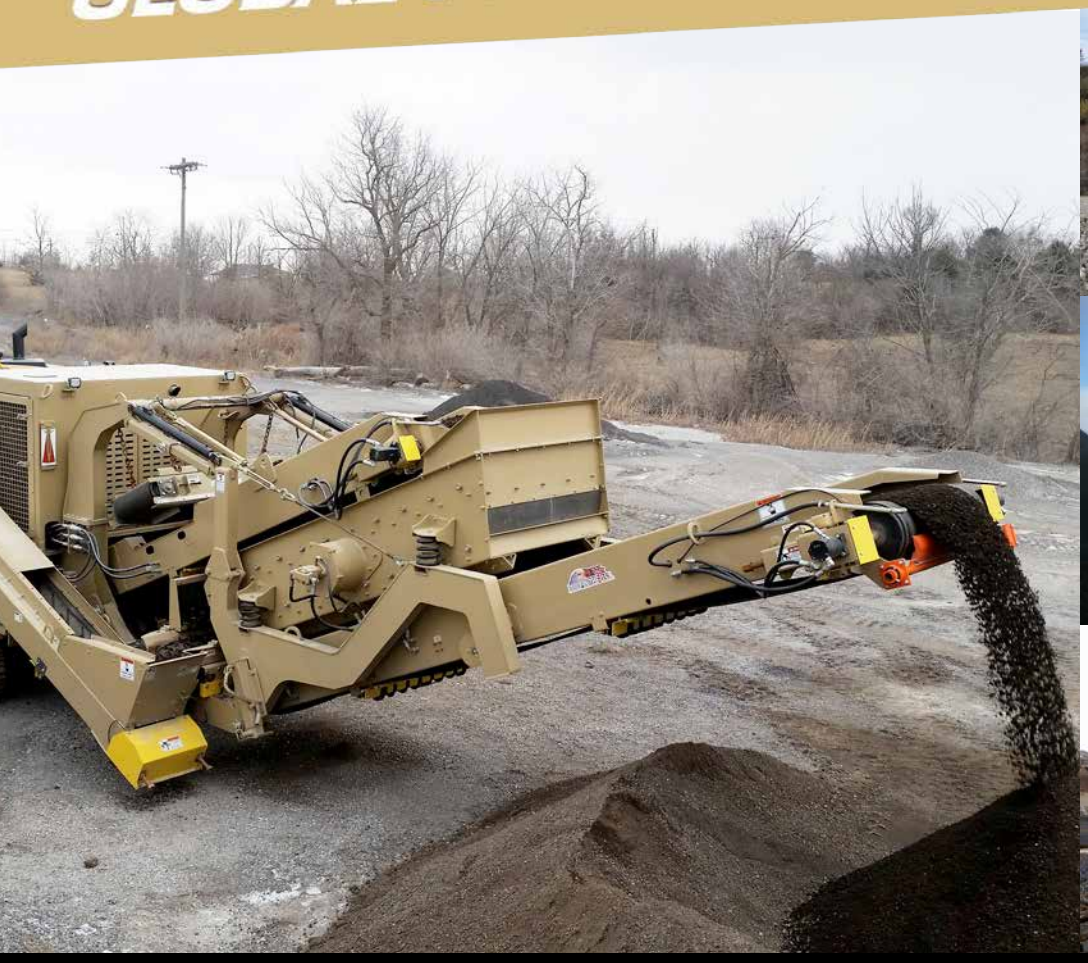

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