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CONSTRUCTION

JANUARY - FEBRUARY 2019



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38,394	387	40,000	20	543
Visitors	Exhibiting Companies	Sqm of exhibition space	Countries	Successful meetings facilitated

PROGRAMMES & ACTIVITIES



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Trade Exhibition

New Product Presentation

Business Matching

Talk Show

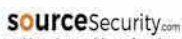
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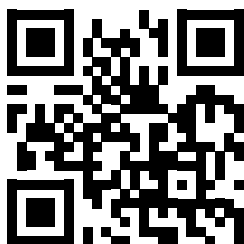
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Mace opens Singapore regional hub office



Mace, the international consultancy and construction company headquartered in the UK, has appointed Nick Brand (left) to run a new regional hub office in Singapore. Mr Brand joins Mace as regional manager for Asia Pacific following 12 years working within the group property function at Barclays, where he served as global head of Capital Projects based in London, the UK, and in the last four years as regional head of Corporate Real Estate Solutions for Asia Pacific and the Middle East, based in Singapore.

Mr Brand will strengthen Mace's operations in Asia, expanding the company's presence across the region. Leveraging his experience of delivering complex capital investment and management programmes, he will work with new and existing clients to find better ways to deliver their projects and programmes.

Reflecting an ongoing commitment to Asia, Mace's new office in Singapore will oversee activities across the region, where over 300 of Mace's employees are located to deliver project, programme and facilities management services for international corporate clients as well as regional developers and operators.

Notable iconic projects delivered by Mace in Asia have included project managing the construction of Landmark 81 (Vietnam's tallest building), the Hong Kong Science Park and

delivering the world's largest casino, the Venetian Hotel and Resort in Macau.

"Mace is an innovative global consultancy that is leading the way on delivering some of the world's most complex and challenging programmes. I'm very proud to be given the responsibility to build on their fantastic legacy to date in Asia and beyond. It's a hugely exciting time and I look forward to working with our clients – both existing and new – to deliver some fantastic results," commented Mr Brand.

"Nick has a fantastic track record of delivering a hugely complex and challenging programme of real estate across Asia Pacific. We have recently launched our new 2022 Global Business Strategy, and Nick's appointment reflects our strategic focus on both securing roles on major programmes and building on the services we can provide to our global corporate real estate clients," said Jason Millett, Mace's chief operating officer for consultancy. "In the long term we see the Asia Pacific region as a hugely significant growth opportunity for our global business, and from his base in Singapore Nick will be tasked with making that a reality."

Mark Kennedy, international operations director for Mace added, "There are hugely exciting times ahead for Mace in Asia Pacific, building on our existing track record of successfully delivering iconic projects across in the region. Nick comes to Mace with demonstrable experience of the regional real estate sector and his appointment reflects our long term commitment." ■

Kobelco expands production capacity at Itsukaichi factory

Kobelco Construction Machinery Co Ltd (KCM) is expanding the production capacity of its main factory, the Itsukaichi factory in Hiroshima, Japan, to accommodate the global demand for hydraulic excavators.

Through enhancement of sales networks in each region and expansion of models and specifications according to the needs of each market, KCM is expecting that its sales volume of hydraulic excavators will continue to increase steadily. Under such circumstances, the company has been putting effort into balancing the production of its six hydraulic excavator factories both in Japan and overseas. However, the production capacity at the Itsukaichi factory has been growing due to its wide range of production menus in models and specifications.

The Itsukaichi factory opened in May 2012 as KCM's main facility for hydraulic excavators (7- to 85-t-class), offering a production capacity of 8,500 units per year. The machines manufactured at this facility are not only designed for the local market, but they are also delivered to the Americas, Europe, Australia, Russia, the Middle East and Africa. The site covers an area of 100,000 sq m, with a building area of 35,000 sq m.

KCM's sales number increased constantly due to steady global demand and the company's re-entry into European and American market after the dissolution of its partnership with CNH Global at the end of 2012. KCM has expanded the factory's production capacity to 8,900 units per year by improving productivity primarily through manpower increase. This time, the company aims to raise the capacity to 10,500 units per year by a full-out production capacity expansion.



Kobelco is increasing the production capacity at its Itsukaichi factory to meet the global demand for hydraulic excavators.

With an investment of about 2 billion yen, KCM plans to enhance various elements, including production capacity expansion for assembly lines and fabricated products (frames) lines through a drastic revision of the existing layouts, advancement of 'smart factory' that promotes computerisation of manufacturing, introduction of efficient assembly processes, upgrading of work safety, and improvement of the workplace environment. These will be carried out step by step and are scheduled to be completed in March 2020. ■



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Liebherr's Tower Crane division acquires Morrow

As of 1 January 2019, the Australian sales and service company of the Liebherr Group will take over the business activities, including all the employees and locations of Morrow Equipment Co LLC in Sydney and Brisbane (Australia) as well as in Wellington (New Zealand).

Christian Chalupny, president of Morrow Equipment, highlighted that the acquisition will not only allow Morrow employees to be part of the Liebherr team, but also enables Liebherr to continue supporting the existing contracts and customer relations.

"We are convinced that we will successfully shape the future with the entire staff at all locations, and in the interest of our customers," added Marco Guariglia, managing director of Liebherr's Tower Cranes division.

Thomas Schröder and Craig Jones, the new responsible managers of the Tower Cranes division at Liebherr-Australia Pty Ltd, are looking forward to consolidating and further expanding along with the employees. They said the excellent know-how of the staff, a rental fleet of approximately 100 tower cranes and 40 hoists, as well as the intention to grow the business were a commitment to further support the customers and the local market. ■

Pöyry secures large-scale combined cycle gas turbine project in Thailand

Pöyry has been commissioned to work on a new combined cycle gas turbine (CCGT) project in Thailand - it is believed to be the largest in the country. The contract was awarded by Gulf Energy Development Co Ltd (GED) and Mitsui & Co Ltd.

The 2,500 MW facility, consisting of four units with each having 625 MW generating capacity, will be located in Sriracha District, Chonburi Province. Pöyry acts as Lenders Technical Advisor in the project, including technical due diligence, construction monitoring and operation monitoring.

The commercial operation date (COD) for the first unit is projected to be in March 2021, with the second to fourth units expected to reach COD in October 2021, March 2022 and October 2022, respectively.

The new power plant is expected to be the cleanest and most efficient CCGT plant in Thailand, said Pöyry. It will comply with the environmental and social standards and the International Finance Corporation (IFC) - Performance Standard, reducing its environmental and social impact beyond the Thai National Standard requirements. It will also help to ensure reliable and cost-effective power within the country, and support Thailand's goal to develop the special economic zone in the same region - the Eastern Economic Corridor. ■

Hong Kong-Zhuhai-Macau Bridge officially opens



Alli images © HKTB



ABOVE LEFT AND FAR LEFT: **The Hong Kong Link Road, part of the HZMB, is 29.6 km long.**

ABOVE: **The passenger clearance building at the Hong Kong Port.**

LEFT: **A general view of the public transport interchange at the Hong Kong Port.**

The world's longest bridge and tunnel sea crossing – the Hong Kong-Zhuhai-Macau Bridge (HZMB) – has been officially opened, bringing major cities in the Pearl River Delta within easy reach. It also shortens the journey from Hong Kong International Airport to Zhuhai from four hours to just around 45 minutes. The 55-km-long HZMB comprises the 12-km Main Bridge, 29.6-km Hong Kong Link Road and 13.4-km Zhuhai Link Road. It is spanning the sea from an artificial island near Hong Kong International Airport to Macau and the mainland Chinese city of Zhuhai. The bridge is designed to last 120 years, about two decades longer than the lifespan of most major cross-sea bridges. ■



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Sunseap to build seawater floating solar systems

Sunseap Group is developing one of the world's largest offshore floating photovoltaic (OFPV) systems in Singapore, to be located north of Woodlands Waterfront Park, along the Straits of Johor. The facility is expected to start its commercial operation in early 2019.

Supported by the Singapore Economic Development Board (EDB), the 5 MWp (MegaWatt-peak) floating solar system is expected to generate about 6,388 MWh of renewable energy annually, once completed - with a reduction in greenhouse gas emissions of about 2,600 t per year, over the next 25 years and beyond.

While most large-scale floating PV systems are built on freshwater ponds, lakes or reservoirs, Sunseap's latest project will be on seawater. "Our floating solar system supports Singapore's ambition to be a solar hub for Asia, and we hope it will ignite more deployment of alternative methods of tapping solar energy," said Frank Phuan, co-founder and CEO of Sunseap Group.

Mr Phuan further highlighted that in land-scarce countries like Singapore, the widespread use of PV systems is hindered by space constraints and limited roof space. The successful delivery of this project is important in opening up similar opportunities for sea-based floating PV systems in Singapore and the region.

Rob Khoo, VP of marketing communications at Sunseap Group added, "Solar energy is a key renewable energy source in Singapore and Sunseap is constantly innovating and exploring more efficient ways to deploy cutting-edge technologies that will help us protect the environment for future generations."

"Solar is one of the most viable and sustainable clean energy options in Singapore, and we continue to see innovative solar solutions being developed and deployed here," said Damian Chan, executive director of energy, chemicals & materials at EDB. "Beyond



An artist's impression of the offshore floating photovoltaic (OFPV) systems to be built in Singapore by Sunseap, located north of Woodlands Waterfront Park, along the Straits of Johor.

contributing to Singapore's energy security and climate change commitments, Sunseap's offshore floating photovoltaic system will help the clean energy ecosystem and build new, exportable capabilities for potential scale-up across the region."

Sunseap has previously participated in the world's largest floating PV test-bed in Singapore at Tengeh Reservoir. According to the company, results so far show that the floating PV systems perform better than typical rooftop solar PV systems in Singapore, due to the cooler temperatures of the reservoir environment. ■

TNC inaugurates new branch office in Da Nang

Genie dealer in Vietnam, Tuyet Nga Company Limited (TNC), has set up a branch office in Da Nang. This new facility aims to position the company closer to its customers in the Central Vietnam region and expand the reach of Genie in the country.

Founded in 1995, TNC is headquartered in Hanoi with first branch office located in Ho Chi Minh City. Its subsidiary, Vietnam Rental, has been experiencing a steady growth momentum; its turnover increased by almost 30% over the previous three years, which in turn grew the company's fleet size to 750 machines. They include Genie mobile elevated work platforms (MEWPs) and light towers.

"Our partnership with Genie for the last 20 years is a key factor in driving our growth. They are known for their cutting edge engineering and safety features. With our government focusing on reducing accident rates at jobsites, we are proud to offer a 100% Genie fleet to the market,"



TNC has opened a branch office in Da Nang to serve the Central Vietnam region.

said Madam Tran Kim Dzung, general director of TNC.

"The decision to open a branch there made a lot of economic sense. We want to be a trailblazer in the Central Coast Area in access equipment rental by providing the quickest rental service and best customer support," she added.

Investments from foreign companies have given the civil and industrial

construction sectors in Vietnam a boost. The demand for MEWPs is also spurred by the entry of foreign contractors from developed countries such as Germany, USA, Australia, Korea, Japan and Singapore, drawn by large-scale projects such as the construction of the new airport terminal. They hold higher standards for project management and safety issues, thus increasing the relevance for MEWPs.

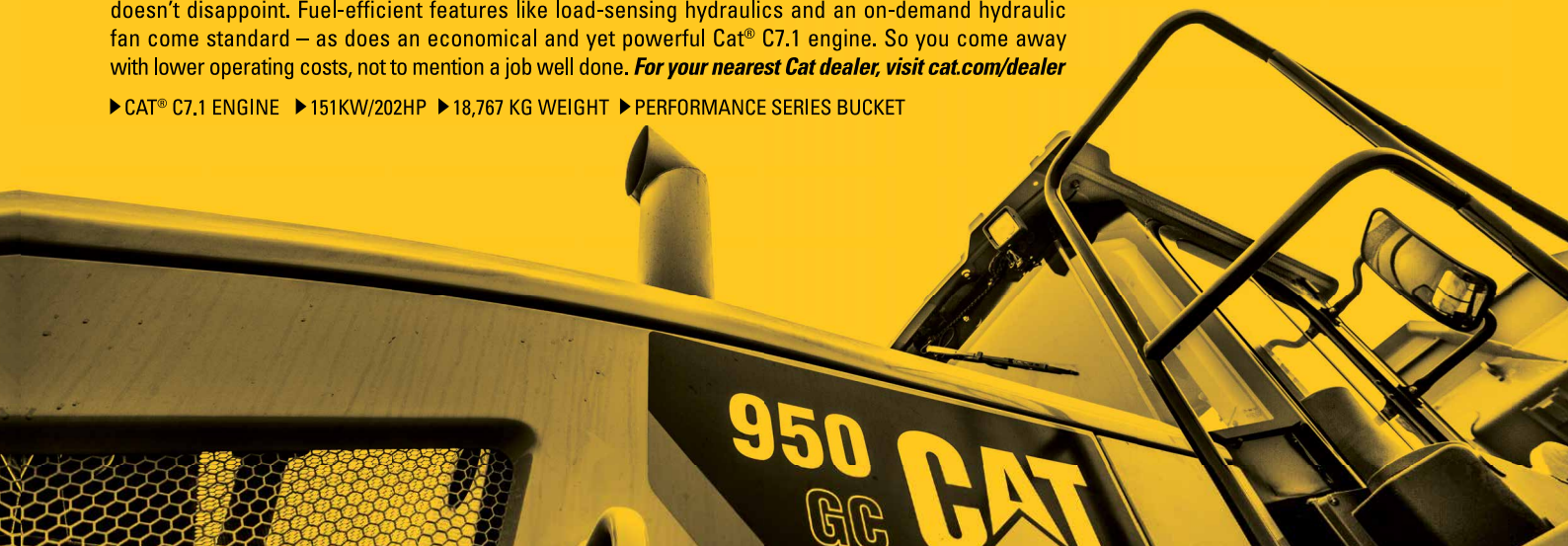
The new Da Nang office is currently supported by a 10-people team that handles both sales and technical services. It is led by Dao Son Hai, who brings with him extensive experience in managing projects of various scales in South Vietnam. Mr Dao will be strengthening the team in all aspects of operations to take Vietnam Rental and Genie to the next level.

"We are targeting a market share of more than 65% and increase our fleet size to 200 machines in two years," said Mr Dao. ■

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Shanghai's tallest twin towers in full swing



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Sitting on a 4.05-ha site along Huangpu River in North Bund, Shanghai's tallest twin towers (pictured above) are currently in full swing. The project has achieved structural completion and is expected to open in phases from the second half of 2019.

With a total gross floor area (excluding carpark) of 312,717 sq m, this mixed-use development comprises two 50-storey premium Grade A office towers linked at the base by a seven-storey shopping mall. Standing at 263 m, the towers offer 270-degree panoramic views of Shanghai Bund and Lujiazui CBD on both sides of Huangpu River.

CapitaLand, through Raffles City China Investment Partners III (RCCIP III), has formed a joint venture with Singapore's sovereign wealth fund GIC to acquire the twin towers. The project will become CapitaLand's third Raffles City integrated development in Shanghai. ■

Leighton Asia to work on 'Oh My God' mixed-use development in India

Leighton Asia has been selected by developer Bayaweaver Ltd as its Alliance partner to construct the 'Oh My God' mixed use development in Noida, India. Construction is expected to complete in mid-2022. The project consists of a 38-storey tower with 736 studio apartments, the Radisson Red hotel, retail outlets and car parks, and a further three-storey retail building.

Leighton Asia is part of CIMIC Group construction company CPB Contractors. "It is our privilege to support the growth of the Noida region and to leverage our industry-leading engineering capabilities and workforce solutions to construct new commercial and social precincts of long-term value," said Juan Santamaria, managing director of CPB Contractors.

"This award recognises Leighton Asia's considerable expertise in the high-end building sector and positions us well to capture future opportunities within the highly competitive Asian market," added Michael Wright, CEO of CIMIC Group. ■

ChemGrout appoints new distributor in China

ChemGrout, a US-based global manufacturer of grouting equipment, is expanding its presence in the Asia Pacific market with the appointment of Shaanxi Tian Shuo Industrial Co Ltd as its new distributor in China.

Headquartered in Xi'an, Tian Shuo is now responsible for sales of ChemGrout equipment in the Chinese market (mainland). The company is also in charge of repair and maintenance of the equipment for its local customers.

"Having a local distributor will help us expand into the Chinese market. Tian Shuo is well connected and they know a lot of people in the grouting industry, so we believe this collaboration will be a tremendous advantage for ChemGrout," said Rob Galbavy, marketing manager of ChemGrout. "There is a wide range of projects taking place in China, such as tunnelling and railway developments, where our equipment is expected to be involved in."

ChemGrout manufactures a variety of standard and custom-built grouting equipment to handle a diverse range of materials and capacities (from 3.8 to 284 l/min), with pressures from 3.4 to 138 bar. The company's high-pressure pumps can manage pressures up to 138 bar and flows up to 189 l/min.

ChemGrout has been active in Asia Pacific for many years, with an established dealer network across Southeast Asia, Taiwan, Hong Kong, mainland China, Australia and New Zealand. Speaking to Southeast Asia Construction earlier this year, Joe Schatz, general manager of ChemGrout, said that he is optimistic about the future of the company in the region. "We see widespread acceptance of our equipment throughout Asia Pacific, and we continue to see infrastructure spending driving growth." ■



LEFT: Executives from ChemGrout and Tian Shuo were present at the bauma China 2018 in Shanghai.

BELOW: ChemGrout CG-680 high-pressure (HP) series has been widely used in projects across Asia Pacific. It is suitable for tunnelling, dam foundations, soil compaction and encasements, among others.



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New leader for BuroHappold Engineering in Asia



Richard Marshall (left) has been appointed as managing director of BuroHappold Engineering's Asia office, based in Hong Kong. He has relocated from the company's Dubai office and is returning to Asia, having worked in BuroHappold's Kuala Lumpur office in 1997 and having lived and worked within Asia since the early 1970s.

Mr Marshall leads BuroHappold's Tall Building's Expert Community and has a special interest and expertise in both tall building design and other complex buildings. He has been involved in a multitude of tall building projects of up to 720 m/150 storeys in height around the world. As an expert in structural engineering, Mr Marshall has worked in various BuroHappold office locations around the globe including the UK, Europe, North America, Asia and the Middle East during his 21 years with the business.

"It is a pleasure to return to Asia to lead the region at such an exciting time, with the continued growth of the Greater Bay area and growing strength of regional economies, all which offer opportunities. The business has grown significantly since its establishment, thanks to the hard work of all the staff and directors," said Mr Marshall.

BuroHappold's Hong Kong office has participated in some of the most high-profile projects in the region, adept at dealing with highly complex challenges. Several of them open this year including Morpheus Hotel in Macau, the Xiqu Opera House, the West Kowloon Express Rail Terminal (XRL) and the Boundary Crossing Facility.

"The Asia region is of strategic importance to us. Richard's appointment strengthens our senior leadership in the region, and I look forward to working closely with him and other directors to harness the opportunities the region provides," said James Bruce, chief operating and financial officer of BuroHappold Engineering. ■

Tiong Woon adds boom booster kit for Demag CC 8800-1 crawler cranes

Singapore-based heavy lift and haulage service provider Tiong Woon Corporation (TWC) has entered into a sales agreement for the delivery of a boom booster kit for its three Demag CC 8800-1 crawler cranes, which are now in service.

"We consider the Demag CC 8800-1 to be synonymous with quality, reliability and powerful performance characteristics. And while its large lifting capacity of up to 1,600 t is impressive, the boom booster increases the lifting capacity of the existing CC 8800-1, making the CC 8800-1 superior to any other crane in the class of up to 2,000 t," said Ang Kah Hong, chairman and chief executive officer of TWC. "We are constantly upgrading our capacity and exploring ways to be more efficient by providing integrated solutions for our clients to meet their heavy lifting requirements."

Norbert Dudek, vice president of Terex Cranes Asia commented, "We value TWC as an extremely important and significant customer. And of course we are very pleased about the renewed vote of confidence with the purchase of our boom booster kit, which will significantly enhance the performance and cost-effectiveness of TWC's Demag CC 8800-1 crawler cranes." The boom booster kit can either be ordered directly with a new crane or retrofitted as a kit for cranes already delivered.



Norbert Dudek, VP and GM of Terex Cranes Asia (left) and Ang Kah Hong, chairman and CEO of TWC sign the sales agreement at bauma China 2018.

As a full-service provider, TWC primarily works with the oil and gas petrochemical industry as well as in the areas of infrastructure and construction; and the company uses its own heavy-duty cranes and transport vehicles for this purpose. TWC currently owns 512 cranes with a capacity of up to 1,600 t. In addition to its headquarters in Singapore, the company has branches in Malaysia, Indonesia, Thailand, the Philippines, Vietnam, China, Sri Lanka, India and Saudi Arabia. ■

ADB helps upgrade roads in Vietnam

The Asian Development Bank (ADB) has approved a US\$188 million loan to improve and upgrade 198 km of roads in Vietnam's mountainous northwest region. These improved roads, which will connect several remote areas of the region to the Noi Bai-Lao Cai Expressway, will boost the area's trade with two neighbouring countries, Laos and China. With climate-resilient features such as slope protection in areas prone to landslides and rockfalls, the project will provide the area's population reliable access to basic social services, such as education, health care, job training and emergency disaster relief.

ADB explained that Vietnam's northwest region, which

includes the provinces of Dien Bien, Hoa Binh, Lai Chau, Lao Cai, Son La and Yen Bai, have not benefited from the backbone of the northwest region's road network, the Noi Bai-Lao Cai Expressway, which is part of the Greater Mekong Subregion (GMS) Kunming-Hai Phong Transport Corridor that connects the Hanoi region to China's Yunnan province. This is because the national and provincial road networks are largely incomplete, and the condition of the existing roads is generally poor. The ADB project aims to help the region overcome those difficulties by ensuring high standards for road construction and addressing the risks posed by climate change. ■

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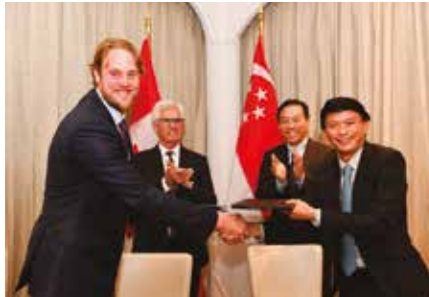


Pan-United and CarbonCure to produce 'green' concrete

Singapore-based company Pan-United Corporation Ltd has formed a strategic partnership with CarbonCure Technologies Inc to apply a breakthrough technology using carbon dioxide to produce greener and stronger concrete. It is believed that Pan-United is the first in Asia to use CarbonCure's product innovation. The company aims to introduce the technology to ready mix concrete producers in Singapore and subsequently to other markets in Asia.

The CarbonCure Technology chemically converts carbon dioxide captured from industrial emitters into a nano-mineral that becomes permanently embedded within concrete. The process improves concrete's compressive strength and enables concrete producers to realise manufacturing efficiencies while reducing the concrete's carbon footprint.

With the CarbonCure Technology, Pan-United has the potential to save over 4,000 t CO₂ emissions annually at each of its concrete plants. This is said to be equivalent to the amount of CO₂ that would be sequestered by forestland blanketing 2.6% of the total landmass of Singapore.



The strategic partnership agreement was signed in November 2018 between Pan-United and CarbonCure. Ken Loh, executive director of Pan-United (front right) shakes hand with Christian Weisenburger, CarbonCure's general counsel who represented CarbonCure's founder and CEO Robert Niven.

"Singapore is a vital gateway for CarbonCure's entry into Asia to further our global efforts to mitigate harmful carbon emissions from the built environment," said Robert Niven, CarbonCure's founder and CEO. "We are delighted and convinced that we have a like-minded and strong partner in Pan-United, which is the industry leader in Southeast Asia for advancing green concrete initiatives."

Headquartered in Canada, CarbonCure is a global leader in carbon dioxide utilisation technologies for the cement and concrete sector. The company is supported by Breakthrough Energy Ventures, a US\$1 billion fund created to accelerate the world's transition to clean energy, whose investors include Bill Gates, Jack Ma, Jeff Bezos and Masayoshi Son, amongst others.

"Pan-United is excited to expand our portfolio of sustainable initiatives with the addition of CarbonCure's unique breakthrough technology," said Ken Loh, Pan-United's executive director. "We view its clean technology as very useful in addressing the urgent climatic need to reduce the global carbon footprint. Pan-United intends to expand the use of the CarbonCure Technology by introducing it to other ready mix concrete producers in Singapore and the region.

"While reducing the overall carbon footprint, we believe this special process has multiple benefits to enable sustainability gains not only for concrete producers and the construction industry, but also for developers in their building projects." ■

Skyjack delivers to new customer in Beijing

Skyjack has delivered its scissor and boom lifts to Beijing Hongyu Zhiheng, a rental company specialising in scissor lifts and other construction equipment, which operates across much of Northern China. "It is our first time buying Skyjack products and we chose to enter this new relationship with them due to their reputation for machines that are easy to service and maintain," said Mr Chai, owner of Beijing Hongyu Zhiheng. "Due to customer demand, it was time to increase our stock. With the addition of Skyjack machines, we will now be able to offer a more diversified line up to our customers."

The order, which was received in September 2018, consisted mainly of Skyjack SJIII 3219 electric scissor lifts, which have a maximum working height of 7.62 m and a compact stowed height of just 1.99 m. Beijing Hongyu Zhiheng also decided on the SJIII 4632 electric scissor lifts, which have a maximum working height 11.58 m and 1.22 m extension deck as standard. The company has slowly been breaking into the boom market, and thus it added a Skyjack SJ63 AJ. This lift boasts a working height of 21.21 m, horizontal reach of 12.19 m, and an up-and-over clearance of 8.38 m.

"With a continuous 360 degree rotation, the SJ63 AJ is a welcome addition to our stockyard and we're confident this product class will help meet many of our customers' requirements," said Mr Chai.

"In addition to stocking a new customer with scissor lifts, Skyjack is also proud because this marks our continued success and growth of boom sales into Northern China's rental sector," said Jack Dai, Skyjack's account manager for sales in China. "We're excited to start seeing Skyjack booms on different jobsites in Beijing." ■



LEFT AND BELOW: Beijing Hongyu Zhiheng has taken delivery of its first Skyjack aerial platforms, among which was the SJ63 AJ boom lift (pictured left).





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Surbana Jurong strengthens presence China

Strengthening its footprint in China, Surbana Jurong has signed Memorandums of Understanding (MOUs) with the Chongqing Municipal Government and Danzhou Municipal People's Government respectively.

Together with China Construction Bank, Surbana Jurong signed an MOU with the Chongqing Municipal Government to provide support in various areas of the China-Singapore (Chongqing) Demonstration Initiative on Strategic Connectivity. Areas that the partners will jointly explore include the financing needs of major infrastructure construction, the potential development of a financial technology city and a digital economy pilot zone, the sustainable development of housing rental projects as well as smart cities projects.

The China-Singapore (Chongqing) Demonstration Initiative on Strategic Connectivity is the third bilateral project between China and Singapore and is a strategic part of China's Belt and Road Initiative (BRI). Surbana Jurong was the appointed masterplanner for the Chongqing Liangjiang New Area, providing the blueprint for the city to become a multi-modal hub.

Separately, Surbana Jurong has signed a collaborative MOU with the Danzhou

Municipal People's Government to explore collaboration in various areas including masterplanning and urban design. Danzhou is one of the major cities in Hainan province, and the Chinese government has recently earmarked Hainan as a Free Trade Zone (FTZ) that will span 35,400 sq km – which will make it the biggest FTZ in China.

Anti-bribery management system

Surbana Jurong has also obtained the Singapore Standard (SS) ISO 37001 certification, which specifies requirements and provides guidance for establishing, implementing, maintaining, reviewing and improving an organisation's anti-bribery management system. Singapore adopted the ISO 37001 and launched the SS ISO 37001 in late 2017.

To obtain the certification, organisations must implement a series of measures that meet globally recognised anti-bribery good practices. These measures cover all aspects of an organisation, including top management leadership and commitment; financial, procurement and contractual controls; anti-bribery policy, procedures and training; third party risk assessments and due diligence; and reporting, monitoring and investigation procedures.



Teo Eng Cheong (front row, far left), Surbana Jurong's CEO International (Singapore, SE Asia and North Asia) signed the MOU at the China-Singapore (Chongqing) Connectivity Initiative Financial Summit.

Liew Mun Leong, chairman of Surbana Jurong, stressed that it is important for Surbana Jurong to continuously uphold its core value of integrity among its people, and promote clean business strategy among its partners, clients and other key stakeholders. "Beyond these, the company must also be supported by rigorous anti-bribery management system. The ISO 37001 certification is an international standard adopted by many companies and countries as the acceptable anti-bribery preventive measure. This will serve as a useful separate check and balance management system to help monitor and document business operations to prevent bribery and corruption," he said. ■

Surbana Jurong acquires new architectural firms

Surbana Jurong is set to form one of the largest architectural groupings in the world with the joining of two global architectural firms - Canada-based B+H and Singapore-based SAA - as member companies. It has also entered into a collaboration agreement with Hong Kong-headquartered Rocco Design Architects.

B+H is a global consulting and design solutions firm providing architecture, interior design, planning, landscape design and strategic consulting services with 10 studios around the world. It is ranked 52 in the World Architecture Top 100 and 66 in the Top 100 Interior Design Giants.

SAA is among the Top 10 architecture firms in Singapore, with an established presence across Southeast Asia. It has expertise and experience in the design and delivery of architecture projects across the key sectors of transport, mixed use developments, commercial, healthcare, business parks and residential.



Representatives from Surbana Jurong, B+H, SAA and Rocco Design Architects.

The addition of B+H and SAA aims to deepen Surbana Jurong's technical capability to offer architectural and interior design services for both urban and infrastructure projects globally. It will also strengthen Surbana Jurong's ability to provide comprehensive, end-to-end solutions, from development strategies, to design and engineering services, project and facilities management, and financing solutions to its clients.

The two new member companies will complement Surbana Jurong's current market coverage. Surbana Jurong plans to tap B+H and SAA's presence to expand its service offerings into new geographical markets such as North America and new growth sectors such as healthcare.

In addition, Surbana Jurong has formed a collaboration with Rocco Design Architects in Hong Kong, led by renowned architect Rocco Yim. This long-term partnership intends to jointly pursue projects in the region, particularly Hong Kong and the Greater China Bay Area. ■



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Arup joins Western Sydney Airport project

Global engineering company Arup has been chosen to undertake masterplanning for one of the most significant infrastructure developments in Australia – the new Western Sydney Airport. Serving both domestic and international flights, the airport is due to open in 2026 with a capacity for 10 million passengers, with plans to grow to more than 80 million in the 2060s. There will be extensive road and rail links, with the airport as the focus of a major business precinct.

Graham Millett, chief executive of Western Sydney Airport, has described it as Australia's 'first smart airport.' "We're pleased to have Arup on board as a key partner in planning an airport that will get the most out of emerging digital technology to streamline customer experience," he said. "We're planning for a 5G network across the airport site and planning needs to consider

opportunities for 5G technologies to improve operations."

Mr Millett highlighted that functional airport planning would be essential to informing the physical design of the terminal and airside facilities. "We want it to be easy for people to catch a plane and for airlines to minimise turnaround times for their aircraft – so early planning will be essential to inform the build. We need the airport to be easily expandable as demand grows, without impacting operations."

Arup has also worked on airports around the world, providing planning services for London's Heathrow Airport, HK Airport, Toronto Pearson International Airport, Kunming Changshui International Airport in China and New York's JFK Airport. In Singapore, Arup is working on Changi and in Australia, it has recently worked on Canberra and Perth airports. ■

Arup establishes new rail business in Japan

Arup has also started a rail business in Japan with Alberto Battois as the business leader. According to Arup, this move follows Japan's decision to invest heavily in rail infrastructure and a number of key projects the company has undertaken with Japanese clients across Southeast Asia, including the Red Line in Bangkok, Ho Chi Minh City Metro Line 1, and two lines in Singapore.

Mr Battois has been transferred from Arup's Singapore office to Tokyo to build the new team and business. "Japanese rail and infrastructure players have an incredible wealth of experience to share with the world. We are here to help them implement

their vast knowledge with the world for the benefit of the whole global rail industry," said Mr Battois.

In close collaboration with Arup's global offices, the new rail team will provide rail engineering on both infrastructure and systems as well as advisory services. Mr Battois brings around 20 years of global experience in rail engineering and consulting, of which almost 10 were closely involved with the Japanese rail industry. He started his career in Italy as a signalling systems engineer, and since then he has been working in many countries including Australia, Japan, Hong Kong and Singapore. He joined Arup in 2016 to lead the Singapore Rail Systems team. ■

JP Nelson opens new facility in Malaysia and becomes Sinoboom distributor

Singapore-based company JP Nelson has reinforced its presence in Malaysia with the establishment of JP Nelson Equipment (KL) Sdn Bhd and Kanamoto & JP Nelson Equipment (M) Sdn Bhd. The grand opening ceremony for both companies took place in October 2018.

Located on the same premises in Nilai, these companies will provide sales and rental of equipment for the Malaysian market. JP Nelson Equipment (KL) Sdn Bhd supplies foundation equipment and lifting cranes; while Kanamoto & JP Nelson Equipment (M) Sdn Bhd offers power generators, air compressors, boom lifts and scissor lifts, among others.

At the same time, Chinese manufacturer of aerial work platforms Sinoboom has also appointed Kanamoto & JP Nelson Equipment as its distributor for boom lifts and scissor lifts in East and West Malaysia. The signing of the agreement between the two companies was held during the grand opening event in October. ■



ABOVE, LEFT AND BELOW LEFT: The newly opened JP Nelson Equipment (KL) Sdn Bhd and Kanamoto & JP Nelson Equipment (M) Sdn Bhd will serve the Malaysian market.



Sinoboom has also appointed Kanamoto & JP Nelson Equipment (M) Sdn Bhd as its distributor for East and West Malaysia.

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Bauer wins Palm360 project in Dubai

Bauer Spezialtiefbau has secured a contract from Nakheel to provide specialist foundation engineering works for the Palm360 project on the Palm Jumeirah island, Dubai. It is planned for completion in 2021 and will be located on the western side of Palm Jumeirah's crescent, comprising 125 hotel rooms and 331 luxury residences with 16 penthouses.

This new luxury hotel and residential development, estimated at around €5.6 million, includes the implementation of around 600 foundation piles to a depth of 54 m to stabilise the ground for the construction of the 260-m-long building. The project consists of the construction of Raffles The Palm Dubai Hotel and Raffles Residences Palm360.

Once completed, the complex will reportedly have the world's largest sky pool, which will connect the two building towers at a height of 170 m. There are also numerous restaurants, wellness facilities and a 500,000-sq-m landscaped garden.

Back in 2004, Bauer also played a key role in the construction of the Palm Jumeirah island. Vibro techniques were used to consolidate over 10 mil cu m of sand and the subsoil was stabilised for the future development. ■



Completion of the Palm360 - a new luxury hotel and residential development in Dubai - is planned for 2021.



Thorsten Ries (right), managing director of Nakheel Hospitality and Leisure, together with Frank Haehnig (left), managing director of Bauer Spezialtiefbau GmbH.

Meinhardt and CCYRM team up in SE Asia and Middle East

Global engineering company Meinhardt Singapore Pte Ltd (MSPL) has signed a Memorandum of Understanding (MOU) with China Construction Yangtze River (Malaysia) (CCYRM), a subsidiary of China's investment construction group China State Construction Engineering Corporation, to collaborate on iconic infrastructure and building developments in Southeast Asia and the Middle East.

Under the MOU, Meinhardt will complement CCYRM with its full suite of integrated planning, design, project management as well as commercial advisory expertise through Meinhardt's commercial advisory and investment arm, MGI Capital, for infrastructure and building developments internationally.

"Urban and infrastructure projects in the world are getting more and more complex, large and sometimes transverse different countries. Strategic partnerships essential to penetrate markets faster, provide innovative solutions and help our clients save time and money," said Omar Shahzad, group CEO of Meinhardt. "CCYRM will be an invaluable partner with Meinhardt especially for projects in Southeast Asia and the Middle East, where Meinhardt has many years of experience working in these markets."

"We are excited about this collaboration as Meinhardt's deep technical expertise will supplement CCYRM with our business development activities through market insights, investment opportunities as well as innovative engineering support," said Zhou Yong, managing director of CCYRM. "This partnership will provide valuable access and opportunities for both organisations to connect, partner and co-create solutions, thereby bolstering a strong ecosystem to jointly expand into the regions." ■

Gammon and Sanfield in JV for HK road contract

Gammon Construction Limited in joint venture with Sanfield (Management) Limited has been awarded an approximately HK\$2.3 billion project to widen Sai Sha Road in Shap Sze Heung, Sai Kung, Hong Kong. The contract was awarded by Sun Hung Kai Properties Limited.

The project involves widening of a section of the current road from two lanes to dual two lanes, development of a cycling track, installation of noise barriers, implementation of greening works to compensate for the affected trees, construction of three footbridges and extensive water and sewage utility provisions - including two pumping stations and installation of sewage pipes by tunnel boring machine along existing roads 2.1 km north of the project to the Ma On Shan area.

The project is expected to be complete in 2023, upon which Sai Sha Road will be wider with enhanced road safety together with the elimination of flooding risk.

According to Gammon, the application of innovative technologies will form a key approach on the project, which include the implementation of 4D Building Information Modelling (BIM) for construction of the pumping stations and the exploration of modular construction approaches for E&M works. Drone and 3D land surveying will also be adopted to monitor the 4.1-km-long site area to maintain instant and reliable project progress records. Engineers will also be able to access tree felling, transplanting and retaining progress using mobile apps on a real-time basis.

A comprehensive set of key risk factors and mitigation measures for the Sai Sha project have been identified within Gammon's Zero Harm framework to ensure that works are carried out in a safe and sustainable manner. An estimated workforce of around 600 will be engaged during the peak construction period. ■

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'Construction projects by megacities valued at US\$4.2 tril'

A total of 6,645 planned and ongoing construction projects by the world's megacities, valued at US\$4.2 trillion and fuelled by the increase in population, are sparking interest in residential and infrastructural developments, according to data and analytics company GlobalData.

The United Nations predicts that, between 2016 and 2030, the percentage of the world's population living in cities with at least a million inhabitants is likely to grow from 23% to 27%, and the number of megacities is projected to increase from 31 to 41.

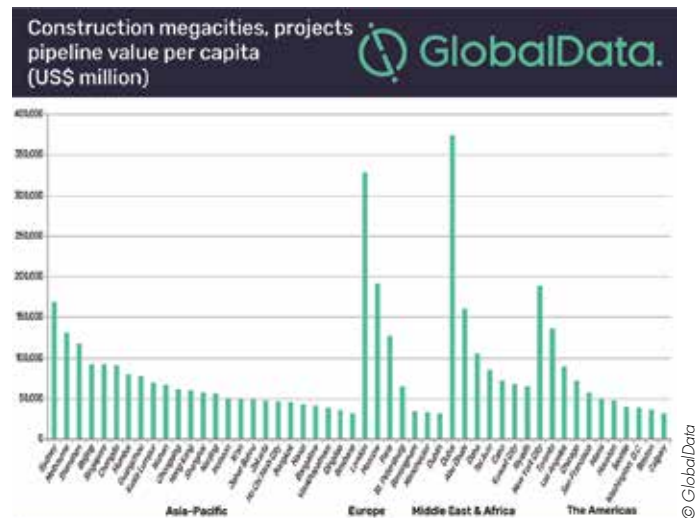
Following a recent assessment of project pipelines in major cities worldwide by GlobalData, a listing of 50 'Construction Mega Cities', discovers they each have a pipeline of projects with an investment value above US\$30 billion.

Asia Pacific dominates the list

Based on the report, Dubai tops the list with total project values amounting to US\$374.2 billion, just ahead of London in second place with US\$328.7 billion and Moscow in third with US\$191.5 billion. However, the Asia Pacific region dominates the list, accounting for 25 of the 50 cities, and having a combined projects pipeline valued at US\$1.7 trillion.

"The ranking of Construction Mega Cities in the Gulf states shows they are spending the most on major development projects relative to the size of their populations," said Yasmine Ghazzi, economist at GlobalData. "Dubai, for example, has a population of 3.2 million, but it holds the top position in terms of the value of the construction mega-projects pipeline per capita. In addition, the number of people living in Doha has increased to 1.1 million as the Gulf state recruits tens of thousands of workers to work on major infrastructure projects linked to the 2022 FIFA World Cup; their project pipeline valued at US\$105.6 billion."

There are major differences among the 50 Construction Mega



Cities in terms of the value of the project pipelines compared to the size of the economies, reveals GlobalData. Visakhapatnam, one of India's largest ports and an important industrial town and seaside resort, tops the ranking primarily owing to the government's push on infrastructure and affordable housing.

Ms Ghazzi added, "The two main cities in Vietnam, Hanoi and Ho Chi Minh City, also feature in the top 10 ranking of cities in terms of the value of the project pipeline in relation to the city's economy."

"Ho Chi Minh City's economy recorded high economic growth in the first six months of 2018, with the construction industry recording growth of 7.7%. The city is expected to grow by around 8.8% a year, ahead of Hanoi (8%) and many other major cities in the region – outside of China and India – between 2018 and 2022." ■

LiuGong appoints Kevin Thieneman as VP



LiuGong Machinery has promoted Kevin Thieneman (left) to vice president. In his new role, Mr Thieneman will be responsible for global strategy and business development, global after-sales business, and support the acceleration of market segment solutions. He will also continue to serve as executive chairman of LiuGong North America, a position he has held since June 2017.

Mr Thieneman has 25 years of experience in the construction equipment sector. Prior to joining LiuGong, he was president of Caterpillar Forest Products and had served in senior leadership roles for Caterpillar in the Asia Pacific region for over a decade. He has been a member of the West Georgia Technical College Board of Directors as well as a member of the Industry Advisory Board for Georgia Tech's Supply Chain & Logistics Institute. In May 2018, Mr Thieneman completed his one-year term as chairman of the Georgia Association of Manufacturers.

LiuGong said that Mr Thieneman's knowledge and experience will be an invaluable asset for the company, as it is committed to providing more diversified solutions to support global CE customers and further enhancing its global presence. ■

New Genie VP for global sales and marketing



Terex Aerial Work Platforms (AWP) has appointed Simon Meester (left) as vice president of global sales and marketing for Genie. In this role, Mr Meester will have global responsibility for leading the business' sales, commercial operations and marketing teams, with the aim of strengthening the Genie brand's reputation as an innovator and leader in the global industry, as well as developing deeper customer relationships and improving Genie's commercial operations capability.

Mr Meester and his teams is expected "to take the lead in developing and implementing future solutions and initiatives that proactively address customers' needs and expand on our ongoing commitment to the success of their businesses," said Matt Fearon, Genie president, Terex AWP.

Mr Meester joins Terex AWP from Eaton Corporation where he was vice president and general manager of Eaton's Industrial Control Division. He previously worked for 15 years in various global and regional roles with Caterpillar and Sandvik with increasing levels of responsibilities. Mr Meester has lived and worked in Europe, the Middle East, India, China and the US. ■

Work on Haulotte's new headquarters to start soon

Haulotte will soon start the construction of its new headquarters in Lorette, located in the Loire region of France. It will be built near the company's manufacturing site. The 5,000 sq m of office space will include open areas to promote a collaborative work environment, and features an eco-friendly building with natural lighting.

On a 31,000 sq m area, Haulotte's research and development will be placed at the heart of this site with 2,500 sq m devoted to innovation and prototypes to design the equipment of the future. There will also be conference and meeting areas for its customers, plus the Haulotte Academy to provide training specifically designed for international customers and their staff.

Acquisition of Acarlar Makine

In another development, Haulotte has acquired its Turkish distributor Acarlar Makine, which is based in Istanbul and employs 34 staff in four branches throughout Turkey. Established in 2003, Acarlar Makine was part of Acarlar Group and became the exclusive dealer of Haulotte in 2003.

"This acquisition is in line with the participation taken in 2014 in a market that has now confirmed its potential of growth. Despite



An artist's impression of Haulotte's new headquarters in Lorette, France.

recent variations of the Turkish lira, we believe that the long-term perspectives in Turkey remain attractive for Haulotte Group," said Alexandre Saubot, deputy CEO of Haulotte Group. ■

Patrick Zanen joins Gomaco



Patrick Zanen (left) is returning to Gomaco as global director for business development. He will be working directly with Kent Godbersen, Gomaco's vice president of worldwide sales and marketing, on the global view of the company's sales and distribution network.

"I feel like I am returning to my roots, as I began my career in slipform paving as a young man in Ida Grove, Iowa," said Mr Zanen. "I have dedicated a large portion of my life to the sales and service of concrete paving equipment and it is a privilege to be working together again in a family environment and with the Gomaco team." ■

Mr Zanen began his concrete career with Gomaco in the early 1980s and most recently was the head of product management and sales for Wirtgen's slipform paving division. He is a citizen of Belgium and speaks Dutch, French, German and English.

"I am looking forward to working with Patrick on the global sales and service of Gomaco products," said Mr Godbersen. "The interest in our product line has reached historic levels and it is important for us to give every Gomaco customer and potential customer an opportunity to pave with the latest in concrete paving technology. Patrick brings with him a wealth of knowledge in slipform paving as well as a vast amount of experience working directly with both customers and dealers. He is well travelled and familiar with the paving requirements of the various regions around the world." ■

Killgore promoted to JCI president



Rob Killgore (left) has been promoted to president of Johnson Crushers International (JCI). In his new role, Mr Killgore will be responsible for setting and achieving JCI's goals and objectives.

Mr Killgore joined JCI in 2016 and served as manufacturing manager. With over 30 years of leadership experience, beginning with his military career and progressing through many manufacturing businesses, he has been an integral part of JCI's success over the last two years. JCI is part of Astec Industries.

"Rob's long and diverse career brings a new perspective to JCI. We are eager to see how his background will help us operate more efficiently and serve our customers more effectively," said Jeff Schwarz, group president of Astec Industries. ■

Hiab completes acquisition of Effer cranes

Hiab, a global provider of on-road load handling equipment, has completed its acquisition of Effer SpA from CTE Group. The signing of the transaction was announced earlier in July 2018.

Effer is a global knuckle-boom crane manufacturer, headquartered in Minerbio, Italy, with approximately 400 employees. Its product range includes truck loader cranes, special application truck cranes, and marine cranes, with particular recognition for heavy cranes >100 tm capacity. Distribution is managed through a network of more than 100 dealers covering around 60 countries globally.

Effer will continue to operate under its own brand and identity, and through its current dealer and distribution partner network. The company will be part of Hiab's global cranes organisation, with Lorenzo Cipriani continuing as managing director, reporting to Joakim Andersson, senior vice president for cranes at Hiab. Scott Phillips is the new president of Hiab. ■

Vermeer acquires Vac-Tron

Vermeer has recently announced its acquisition of Vac-Tron Equipment as well as its plans to bring the Florida-based company together with McLaughlin Group, which was purchased by Vermeer in 2017. This acquisition and integration of the two companies builds on the Vermeer strategy to provide a comprehensive suite of vacuum excavation technology, equipment, training and support to the growing underground utility and soft dig markets.

Founded in 1997, Vac-Tron has grown to become a respected brand known for innovative, high-quality vacuum excavation products sold and serviced across underground utility markets. Headquartered in Okahumpka, Florida, USA, Vac-Tron offices and production facilities employ more than 100 people. For the last 13 years, Vac-Tron products have been sold almost exclusively through the Vermeer dealer network.

McLaughlin, a drill tooling and vacuum excavation company founded in 1921 and located in Greenville, South Carolina, USA, with more than 100 team members, has brought nearly a century of industry knowledge into the Vermeer fold.

"This acquisition allows us to leverage the innovation, market expertise and production capabilities across our McLaughlin, Vac-Tron and Vermeer brands to meet increasing customer demand while giving our dealers a more efficient, single-point connection to a full product lineup. Coming together solidifies the long-term strategy and commitment to support customers and dealers in a unified way," said Jason Andringa, president and CEO of Vermeer Corporation.

Operating under the combined group, Vermeer MV Solutions, the organisation will continue to provide Vermeer-branded vacuum excavation equipment and technology through Vac-Tron and McLaughlin series product lines as well as McLaughlin branded utility accessories and auger boring systems.

Vermeer MV Solutions will operate under one combined leadership and sales team led by general manager Dave Van Wyk. Leadership at both Vac-Tron and McLaughlin will come together and serve as a unified team, bringing the strengths and best practices together in the areas of innovation, design, manufacturing, sales and customer support. The Florida and South Carolina locations will continue production as they work together to meet the growing demand within the soft dig markets.

"We've been proud to have the Vermeer name on our equipment for the past 13 years. Now, we are proud to formally be a part of the Vermeer family," said Tim Fischer, president of Vac-Tron. ■

Aurecon has new global CEO



Global engineering company Aurecon has appointed its managing director for Australia and New Zealand William Cox (left) as the new global chief executive officer to lead the company's rapid growth and continuing diversification across Digital, Advisory and Asia. As of 1 February 2019, Mr Cox will be

based in Sydney, Australia.

"This is a terrific opportunity to steer Aurecon during a time of significant growth and change for our industry. Incredible technologies are helping us plan and build infrastructure in a way never seen before, truly changing the way we engineer, design and advise," said Mr Cox.

"My focus areas for the immediate future are to consolidate and continue the growth trajectory in Digital, Advisory, and in Asia where we see immense potential in transport infrastructure, the built environment and fast-growing data centre sector."

Mr Cox is a civil engineer with over 30 years' experience in transport, aviation and infrastructure across Australia and the UK. His new appointment marks the end of current Aurecon CEO Giam Swiegers' successful fixed four-year term, which saw the company more than double its profits since 2015.

Teddy Daka, chairman of Aurecon commented, "William is renowned as one of our industry's most respected leaders and has delivered operational excellence for Aurecon for more than 26 years. His leadership of ANZ saw the region's revenue increase by 22% since 2015. William's extensive experience at Aurecon has ensured that he has a deep understanding of our business, operating environment, our clients and competitors.

"William is a strong advocate for diversity and inclusion, playing a critical role in driving Aurecon's business case for diversity, vital for our innovation agenda. With Giam at the helm, Aurecon undertook a phenomenal journey of growth and transformation, including building an advisory business that now comprises 1,000 people and has delivered 26% growth in revenue over the last financial year.

"We are confident that William's leadership will continue to drive Aurecon's digital innovation, workforce transformation and global growth." ■

Bauer sells Pileco diesel hammer product line

Bauer Maschinen Group has sold the Pileco diesel hammer product line and its associated brand name to Wang LLC, a subsidiary of Wuxi Xinren Universal Machinery Co, a long-standing supplier and partner of Bauer. "This profitable sale was a logical step," said Christian Gress, member of the management board of Bauer Maschinen GmbH. He pointed out that the sale was due to the market developments in the diesel hammer sector in the US and also because the product no longer suits Bauer's overall portfolio.

Despite this change, the US subsidiary of Bauer Maschinen

in Houston, Texas, with approximately 75 employees, will remain under the leadership of Jochen Grundmann. It will operate under a new name, Bauer Equipment America Inc, and will continue to be an important base for the sale of Bauer's entire range of specialist foundation engineering equipment in North America. Service and maintenance work will also be carried out at the approximately 75,000 sq m site in the Conroe Park West industrial park. "We are convinced that, together with our colleagues in the USA, we will be able to continue our business under the new name with continued increasing success," said Mr Gress. ■

Liebherr on track for record-breaking €10 bil turnover

Liebherr expects 2018 to be another record-breaking year, as the company forecasts it will exceed a €10 billion turnover for the first time in its history. Speaking at a press event in October 2018, Kristian Koch, managing director of Liebherr-International Deutschland GmbH, said that in the first six months of 2018, the company's turnover was nearly €5.1 billion, an increase of 6.3% compared with the same period in 2017 (€4.8 billion).

"The growth varied within the regions, with most of them increasing," said Mr Koch. "Significant growth in the Far East, Australia and America, as well as moderate growth in the Near and Middle East, Western Europe and Africa, is outweighing the decreased turnover in Eastern Europe."

According to Liebherr, drivers for growth in 2018 were construction machines and mining equipment - business areas that grew by around 10 percent in total. The two best-selling divisions, Earthmoving and Mobile Cranes increased once again; the former experienced growth in the high single digits and the latter in the double-digit range. The sales increase in the Mining division was even more pronounced thanks to an uptick in the extraction industry, said Liebherr. The company's Tower Cranes and Concrete Technology divisions also experienced growth.

In 2017, Liebherr achieved its highest turnover in the history, with total sales of €9.845 billion. The company ended the year with almost 43,900 employees and invested €749 million back into its business throughout the year. In 2018, Liebherr continued to invest substantially in its international production facilities as well



Johanna Platt (far left) and Philipp Liebherr, recently joined the administrative board of Liebherr-International AG.

as distribution and service network, with €834 million in total. The company anticipated adding over 3,000 new employees by the end of 2018, for a total of almost 47,000 employees worldwide.

Third generation members

Liebherr is also set to remain as an independent family-run business. In early 2018, two more members of the third generation of Liebherr family - Johanna Platt and Philipp Liebherr - joined the administrative board of Liebherr-International AG. Both are grandchildren of Dr.-Ing. E.h. Hans Liebherr, the founder of the company. The management of Liebherr now consists of two members of the second generation plus six members of the third generation. These include: Willi Liebherr and Isolde Liebherr (second generation), as well as Jan Liebherr, Stéfanie Wohlfarth, Sophie Albrecht, Patricia Rűf, Johanna Platt and Philipp Liebherr (third generation). ■

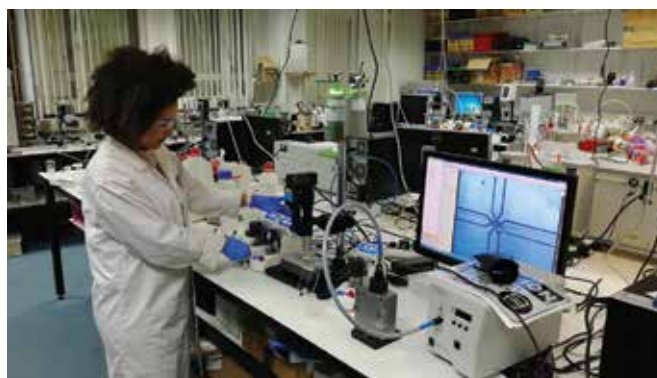
Cambridge researchers developing self-healing concrete

Researchers at the University of Cambridge in the UK have chosen microencapsulation technologies from Dolomite Microfluidics to develop self-healing construction materials. The Department of Engineering's Geotechnical and Environmental Research Group is currently developing microcapsules containing 'healing' agents - such as minerals, epoxy or polyurethane - which can be added to building materials to allow self-repair of small cracks that develop over time.

"Many composite building materials used in the construction industry - such as concrete - suffer fatigue over time, developing small cracks. We are hoping to overcome this problem by adding microcapsules filled with 'healing' agents to the concrete before it is used. The idea is that, as cracks begin to form, they rupture the microcapsules, releasing their payload and stabilising the material," explained Dr Livia Ribeiro de Souza, a postdoctoral researcher in the group.

"This approach requires the formation and functionalisation of double emulsion microcapsules, which we have been producing with the help of microfluidics. We have been using a Dolomite Microfluidics system since 2014, and find that microfluidics offers much better control of particle size and composition than traditional emulsification polymerisation techniques, simplifying the investigation and optimisation of particle properties."

The Dolomite system has enabled the researchers to create functionalised microcapsules that bind more strongly to the cement matrix, while also having thinner shell walls and higher core retention, improving their self-healing properties. Dr Ribeiro



Dr Livia Ribeiro de Souza using a Dolomite Microfluidics system.

de Souza commented, "It is good to be able to discuss any issues we're having with the experts at Dolomite Microfluidics, helping to accelerate our research and move us a step closer to real world applications."

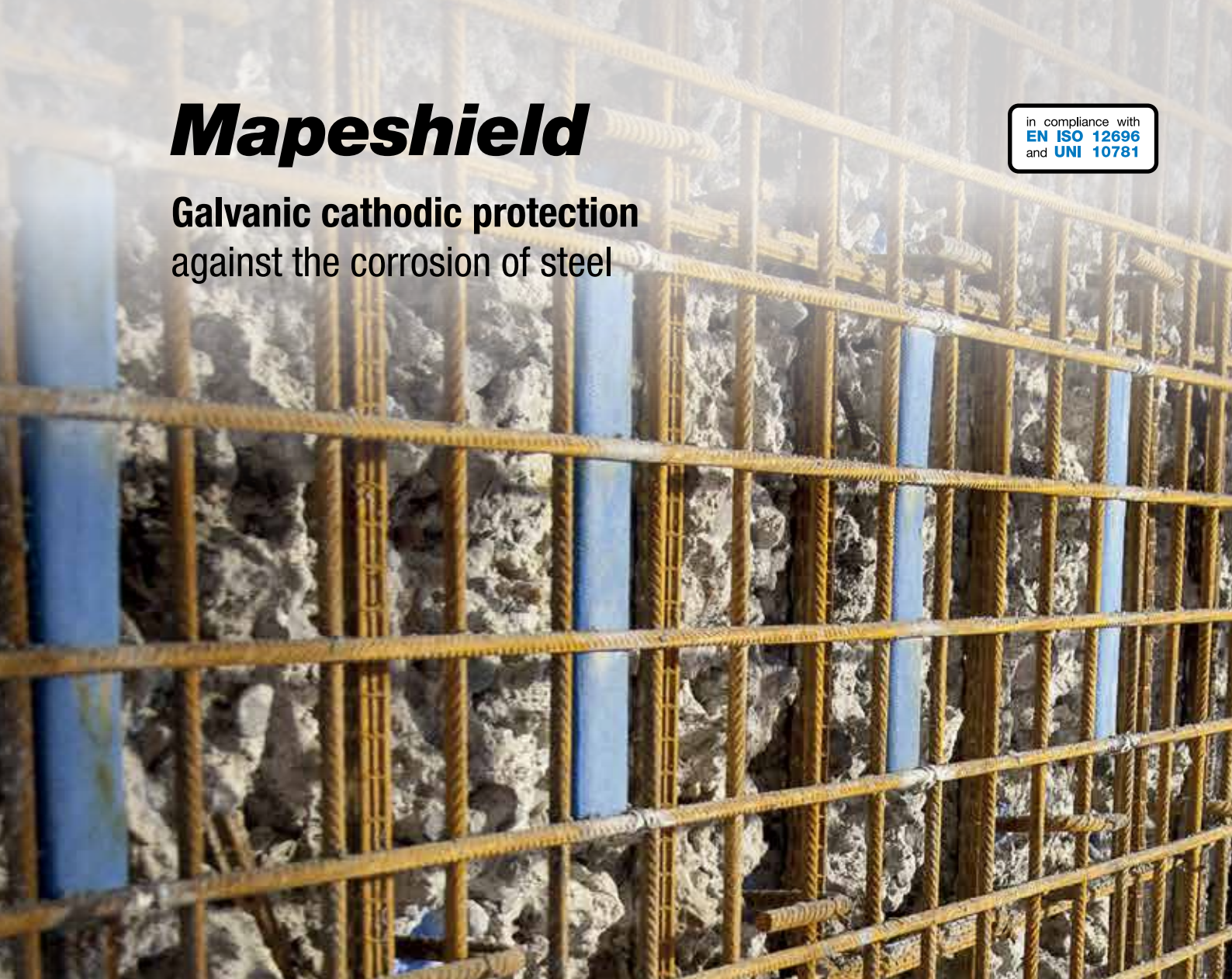
Established in 2005, Dolomite Microfluidics has grown to be a global leader in the design and manufacture of high quality innovative microfluidic products. The company offers a range of microfluidic systems, components and specialist chemicals - including pumps, chips, connectors, temperature controllers, sensors, accessories and custom-made components - as well as software for analysis or automation. ■

Date	Events in Asia	Organiser & Contact
13 to 17 Mar 2019	Worldbex 2019 World Trade Center Metro Manila Manila The Philippines	Worldbex Services International Tel: +632 656 9239, Fax: +632 477 1899 Email: inquire@worldbexevents.com Website: www.worldbex.com
14 to 17 Mar 2019	Megabuild 2019 Jakarta Convention Centre Jakarta Indonesia	PT. Reed Panorama Exhibitions Tel: +62 2556 5000 Email: megabuild@reedpanorama.com Website: www.megabuild.co.id
19 to 21 Mar 2019	Ecobuild Southeast Asia 2019 Malaysia International Trade and Exhibition Centre Kuala Lumpur Malaysia	United Business Media (M) Sdn Bhd Tel: +603 2176 8788, Fax: +603 2164 8786 Email: ecobuild-sea@ubm.com Website: www.ecobuildsea.com
16 to 18 May 2019	Concrete Show India 2019 Bombay Convention and Exhibition Centre Goregaon, Mumbai India	UBM India Pvt Ltd Tel: +91 22 61727000 Email: shannon.andrade@ubm.com Website: www.concreteshowindia.com
17 to 18 May 2019	BuildTech Yangon 2019 Myanmar Expo, Fortune Plaza Yangon Myanmar	Sphere Exhibits Tel: +65 6319 4035 Email: mjaneb@sph.com.sg Website: www.btyangon.com
17 to 18 Jul 2019	Trenchless Asia 2019 Jakarta International Expo Jakarta Indonesia	Westrade Group Ltd Tel: +44 1923 723990 Email: pharwood@westrade.co.uk Website: www.trenchlessasia.com
17 to 18 Jul 2019	IPAF Asia Conference & Showcase 2019 Hangzhou China	IPAF Tel: +65 9686 4191 Email: raymond.wat@ipaf.org Website: www.ipaf.org/asiaconference
4 to 7 Sept 2019	BICES 2019 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
5 to 7 Sept 2019	Intermat ASEAN & Concrete Asia 2019 Impact Exhibition & Convention Centre Bangkok Thailand	Impact Exhibition Management Tel: +662 833 5315 Email: info@asean.intermatconstruction.com Website: www.asean.intermatconstruction.com
18 to 20 Sept 2019	Cambuild 2019 Diamond Island Exhibition & Convention Centre Phnom Penh Cambodia	AMB Tarsus Events Group Tel: +603 2692 6888 Email: richard@ambtarsus.com Website: www.cambuildexpo.com
21 to 23 Nov 2019	Myanbuild 2018 MEP Mindama Yangon Myanmar	AMB Tarsus Events Group Tel: +603 2692 6888 Email: rina@ambtarsus.com Website: www.myanbuild.net
Date	Events outside Asia	Organiser & Contact
8 to 14 Apr 2019	Bauma 2019 Munich Trade Fair Centre Munich Germany	Messe München Tel: +49 89 949 11348, Fax: +49 89 949 11349 Email: info@bauma.de Website: www.bauma.de
10 to 14 Mar 2020	Conexpo-Con/Agg 2020 Las Vegas Convention Centre Las Vegas, Nevada USA	Association of Equipment Manufacturers Tel: +1 414 298 4167, Fax: +1 414 272 2672 Email: international@conexpoconagg.com Website: www.conexpoconagg.com

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ANSI A92 standards updated

The updated ANSI A92 suite of design, safe use and training standards has been published in the US on 10 December 2018, with an effective date of December 2019. The International Powered Access Federation (IPAF) has issued important guidance to help companies and individuals easily identify key changes, to understand their responsibilities and to begin planning to become compliant.

Four IPAF white papers identify key changes to terminology and definitions, requirements for owners and operators, guidance and requirements on risk assessments, equipment familiarisation and requirements for operator and supervisor/manager training that will affect all manufacturers, dealers, owners and users of mobile elevating work platforms (MEWPs), formerly referred to as aerial work platforms (AWPs), in North America.

IPAF is offering all manufacturers, dealers, owners, operators and managers of powered access machinery a comprehensive summary of the key changes in the updated US ANSI standards, as well as the corresponding key changes in the CSA B354 standards, which were published in 2017 and came into effect from May 2018.

IPAF now urges all users and dealers of MEWP equipment in North America to consider how IPAF's operator training programme can assist compliance with the standards. Operators are advised to obtain an IPAF PAL Card, while supervisors of MEWP operations can become compliant with some of the key new requirements in the standard through successful completion of IPAF's MEWPs for Managers training course.

IPAF has issued four separate guides, one for dealers and one for users each addressing the ANSI standards for the US and the CSA standards in Canada. They focus on the new requirements and impacts on a user and a dealer, including important new requirements for MEWP occupant knowledge and MEWP supervisor training.

Tony Groat, IPAF's North America manager, who sits on drafting committees for both the ANSI and CSA standards commented, "Both suites of new standards will require all companies and individuals to be compliant within one year of the effective date of publication – as the ANSI standards will broadly be in line with the CSA equivalents, then it makes sense for firms and their employees to get to grips with the key changes now."

Andrew Delahunt, IPAF's director of technical & safety added, "The updated ANSI standards will lead to a safer work environment when using powered access equipment to work at height. It is not just operators that need to know about safety when working at height – those supervising the use of MEWPs must also be able to plan, conduct proper risk assessments and adequately supervise safe behaviours.

"All users, operators, dealers and training centres have new responsibilities, so the latest IPAF guidance in relation to the new North American standards will doubtless prove very useful in highlighting what is required to become compliant and safe." ■

Website: www.ipaf.org/resources

Haulotte becomes IPAF sustaining member



Haulotte has signed a new agreement that sees the company become one of the first ever sustaining members of IPAF. "This agreement is a great opportunity for Haulotte to emphasise how vital safety and training are when offering work at height solutions. Haulotte is proud to mark this agreement, which highlights one of our main cornerstones: To offer a best-in-class and safe user experience

to our customers," said Stéphane Hubert, chief sales officer of Haulotte.

The signing of the agreement officially took place at IPAF's Europlatform 2018 conference at the Europa Hotel, Belfast, Northern Ireland, on 11 October. Sustaining member is a new category of IPAF membership for organisations that wish to emphasise commitment to the ongoing aim of promoting the safe and effective use of powered access worldwide.

"IPAF is about making the powered access industry safer, ensuring people using MEWPs and MCWPs (mast climbing work platforms) to conduct work at height get to go home at the end of the day, developing training, safety and technical guidance that helps all users of powered access equipment, and providing our members with valuable business intelligence and support services," said Tim Whiteman, CEO and managing director of IPAF.

"The new category of membership is designed to recognise the importance of IPAF's initiatives and how they contribute to the success, health, sustainability and profitability of the powered access industry, now and in future. Creating a legacy by investing in future generations of employees, designers, customers and communities is both a necessity and a responsibility." ■

Malaysian MEWP industry mourns Rocky Tan



The Malaysian MEWP industry mourns the loss of Rocky Tan (left), who passed away on 24 November 2018 at the age of 60. He served as general manager and director of

Eastway Engineering Sdn Bhd, a Malaysia-based access equipment specialist.

Mr Tan was recognised as a pioneer in the Malaysian MEWP industry. He had been in the business since 1982, and had vast experience in dealing with scaffold and powered access equipment.

Mr Tan was also actively involved with IPAF, given his expertise in the Malaysian MEWP market. According to those who knew him well, Mr Tan was always kind and supportive in guiding other MEWP players, sharing his knowledge and experience. "The Malaysian MEWP industry would not be at its current growth level without his passion and vision," they acknowledged. ■



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Inaugural International Built Environment Week in 2019

The Building and Construction Authority (BCA) and its strategic partners, including 12 trade associations and chambers (TACs), will launch a new international flagship event in Singapore for the built environment sector. Themed 'Transforming the way we build', the inaugural International Built Environment Week (IBEW) will be held from 4 to 6 September 2019 at the Marina Bay Sands Expo and Convention Centre. More than 12,000 attendees, from thought leaders, real estate investors and developers to urban planners, architects, engineers, builders and other industry professionals from all over the world, are expected to attend the event.

At the soft launch of IBEW, which was attended by representatives from industry firms and TACs, guests were given sneak peeks into the programmes that would anchor the week. These include: a three-day conference where participants will learn about the latest built environment-related technologies and hear from renowned industry thought leaders; an international business-matching platform for buyers and investors from the region to network and engage with top urban solutions providers; and four trade shows on smart, productive and green solutions, organised by Reed Exhibitions.

The four anchor tradeshow - InnoBuild (IB) Asia, Smart Cities and Buildings (SCB) Asia, Build Eco Xpo (BEX) Asia and Mostra Convegno Expocomfort (MCE) Asia - are targeted at the diverse needs of the region's built environment. The Smart Cities and Buildings Asia show will focus on the convergence of digital solutions and technology in the built environment, as nations across the region intensify their efforts to build smart, liveable cities of tomorrow. At InnoBuild Asia, companies will learn how they can tap on technologies, equipment and systems to build more efficiently and productively. BEX Asia will continue to enhance its focus on sustainability, and also put the spotlight on innovative architectural materials and finishes. The MCE Asia will remain focused on energy-efficient solutions in MEP (Mechanical,



The soft launch of IBEW was held in November 2018.

Electrical & Plumbing) and Renewable Energy.

Following the soft launch of IBEW, BCA also opened the inaugural BuildSG Leadership Forum, a new engagement platform for leaders in Singapore's built environment to share best practices and transformative ideas. The Prefabricated Mechanical, Electrical and Plumbing (Prefab MEP) Manufacturer Accreditation Scheme was introduced at the event. This new scheme was jointly developed with the Specialist Trade Alliance of Singapore (STAS) to ensure a minimum standard in the capability of the suppliers. It certifies Prefab MEP production facilities that have the capability to produce good quality modules. Facilities and prefabricators will be assessed on their overall ability to design, manufacture, and deliver prefabricated MEP modules for local developments. BCA said that Prefab MEP can offer up to 70% onsite manpower savings and has gained traction within the industry over the past two years. ■

Website: www.builtenvironmentexpo.com

ASEAN Super 8 to be held with International Construction Week 2019

The first ASEAN Super 8 mega exhibition in Kuala Lumpur, Malaysia, will take place in conjunction with the upcoming International Construction Week (ICW) from 19 to 21 March 2019 at the Malaysia International Trade & Exhibition Centre (MITEC).

The ASEAN Super 8 will comprise eight industry events including ASEAN M&E, Tenaga, ASEAN Solar, ASEAN Ecolight, ASEAN Lift, IFSEC Southeast Asia, Heavy Mach and Ecobuild SEA – all of them will be held together for the first time under one roof. The event is endorsed by Malaysia External Trade Development Corporation (MATRADE) and supported by Construction Industry Development Board (CIDB) Malaysia.

"The ASEAN Super 8 mega exhibition will enable construction industry stakeholders to be introduced to new products and technologies, as well as explore the innovations available in the market. These include new sustainable materials and energy sources, innovative design approaches, as well as advances in digital technology, in line with the ICW 2019 theme of Construction Beyond 2020," explained Tan Sri Dr. Ir. Ahmad Tajuddin Ali, chairman of CIDB Malaysia.



The official announcement of ASEAN Super 8 exhibition took place at a press conference in October 2018.

The ASEAN Super 8 is expected to attract 20,000 trade visitors, 1,150 exhibitors and 15 country group pavilions, plus 300 group visits from corporate, government bodies, associations and universities. The event will also deliver more than 200 sessions to conduct business matching by MATRADE and CIDB trade visitors. ■

Website: www.super8asean.com



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CAFEO supports Master Plan on ASEAN Connectivity 2025

The 36th Conference of the ASEAN Federation of Engineering Organisations (CAFEO 36) took place from 12 to 14 November 2018 at the Resorts World Sentosa, Singapore. The event gathered more than 1,000 engineering professionals from close to 30 countries to exchange ideas, best practices and solutions to drive economic growth in ASEAN and its individual countries.

Hosted by The Institution of Engineers, Singapore (IES) as the Chairman of the ASEAN Federation of Engineering Organisations (AFEO) for 2018, in association with Singapore's Land Transport Authority (LTA), CAFEO 36 brought together eminent speakers from ASEAN to share their knowledge and experience with AFEO engineers.

In support of the Master Plan on ASEAN Connectivity 2025, CAFEO 36 focused on 'Engineering Rail Connectivity' and 'Fostering Excellence in Engineering Education' as its key themes. These were delivered through the Singapore Rail Technology Conference (SRTC) and ASEAN Engineering Deans Summit (AEDS) respectively.

Organised by IES and SMRT Corporation, the SRTC conference promoted the exchange of knowledge gathered from local and international rail development, management and maintenance case studies, with a special focus on practical solutions.

The AEDS summit, organised by IES and the Singapore University of Technology and Design (SUTD), facilitated discussions on outcomes-based engineering education and accreditation and new pedagogies, to contribute to the transformation of ASEAN's engineering education landscape.

"At this time, there are unprecedented opportunities for engineering and engineers. Asia is currently the main engine of the world economy, accounting for more than 60% of global growth," said Indraneel Rajah, Singapore's Second Minister for Education and Minister in the Prime Minister's Office.

"Asia's population is expanding, its cities are growing and its needs are increasing. In the midst of all this, there is ASEAN. ASEAN has a rapidly growing middle-class and its urban population is expected to increase by another 90 million by 2030. All this translates into an urgent need for infrastructure development. Areas of need



ALL IMAGES: Scenes from the 36th Conference of the ASEAN Federation of Engineering Organisations (CAFEO 36), which took place in Singapore in November 2018.

include power, transportation, water and sanitation, telecommunications, urban solutions, and social infrastructure (e.g. schools, hospitals and community housing).

"Infrastructure development is therefore a key national priority for Asian and ASEAN governments, at both federal and state/provincial levels. This is the time for engineers, because engineers are at the forefront of infrastructure."

AFEO also presented the ASEAN Engineering Register Certificates to about 500 engineers from across eight ASEAN countries. This certification provides endorsement on recipients' professional qualifications to enable them to practice in ASEAN outside of their home countries.

The signing of the Singapore Declaration took place on 14 November by AFEO members to show commitment in promoting railway and transportation

connectivity, urban sustainable solutions, the Vision Zero movement to promote injury-free workplaces, sharing of project knowledge and start-up incubator development as well as excellence in engineering education.

Outstanding achievements

The ASEAN Outstanding Engineering Achievement Awards were given to 18 projects and six individuals from Indonesia, Myanmar, Singapore and Thailand for making significant contributions to advancing engineering and improving quality of life amongst the ASEAN countries; and the AFEO Honorary Awards presented to 87 individuals for rendering exemplary services to the engineering profession. On 13 November, the AFEO Distinguished Honorary Patron 2018 was presented to Prime Minister of Malaysia, Tun Dr Mahathir



Mohamad at a separate ceremony. Other recipients of this award in the past included: His Excellency Hun Sen, Prime Minister of Cambodia; His Excellency Dr. Susilo Bambang Yudhoyono, former President of Indonesia; His Excellency U Thein Sein, former President of Myanmar; and His Excellency TYT Tun Dato' Seri Utama Haji Abdul Raman bin Haji, Head of the State of Penang, Malaysia.

IES also presented Chartered Engineer certification to 10 outstanding local transportation engineers who have made significant contributions in their practice. These Chartered Engineers will also form part of the Assessment Panel to certify more engineers in accordance with IES Competency Standard & Assessment Statement.

Launched in 2013, the Chartered Engineer (Singapore) Registration aims at raising the status and profile of the engineering profession. It recognises qualified engineers across all sectors, particularly in fields that do not require registration as Professional Engineers.

Furthermore, in recognition of his outstanding leadership and the profound impact of his contributions to the engineering industry and community, Er. Chang Meng Teng became the sixth winner of the IES Lifetime Engineering Achievement Award - the topmost honours accorded to engineers in Singapore.

An electrical engineer by training, Er. Chang devoted his career to Singapore's infrastructural development across the public and private built environment sectors. Apart from playing key roles in the development and expansion of power distribution networks in Singapore when he was with the Public Utilities Board, Er Chang also spent 20 years as managing director of Squire Mech Pte Ltd, completing residential, commercial, institutional and industrial developments with engineering excellence. ■

Website: www.cafeo36.com



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Link-Belt introduces 175AT all-terrain crane

Link-Belt has unveiled the latest member of its all-terrain crane, the 150-t (175-US t) 175AT. Building on the success of its predecessors, this new five-axle model is said to be the company's most versatile and compact design yet. It is positioned to meet the demands and expectations of customers in all markets across the globe.

The 175AT is fitted with a robust two-person cab. As part of the design phase, extensive destructive testing took place to confirm the robustness of its lightweight construction. The cab successfully passed tests that included side impact, front impact and roof crush. The interior features incorporate automatic climate control, blue tooth radio, cell phone charging and LED lighting. An air ride seat with lumbar support, heating and ventilation will provide optimum comfort while driving. A multi-functioning steering wheel gives the operator fingertip controls for engine compression braking and cruise control.

Link-Belt is also introducing Pulse 2.0 to the driver's cab with a 7-in full colour, touch-screen display that doubles as the monitor for the Vision camera package. Pulse 2.0 continuously monitors carrier operations that include engine and transmission data, tyre pressures and temperatures, suspension cylinder pressures, and even alerts the driver that the crane is ready for transport in dolly configuration.

As for the operator's cab, it is also tailored for all terrain operations. Pulse 2.0 with its 25.4-cm touch display is at the heart of this crane with features and controls that are intuitive, adaptable and in easy arm's reach. The view from the seat is uninhibited in all kinds of weather with large sweeping wipers in the front and top, and strategically-placed vents for fast-acting defrost.

The 175AT is standard full time 10X8X10 drive with on-highway speed-dependent steering and five jobsite travel steering modes. The crane is powered by a single engine, the 535-hp Cummins QSX15. Through Pulse 2.0, V-CALC (Variable Confined Area Lifting Capacities) provides the operator with 81 different asymmetrical

outrigger positions to best suit the needs of the jobsite. The operator can preview available capacities for all outrigger configurations on the Pulse display.

Standard carrier features that operators are accustomed to include: four points of access to the flat carrier deck, a comprehensive camera Vision package, and the premiere lighting package for nighttime operations. Expanding on these features, Link-Belt plans to introduce a new slip resistant paint coating on all designated walking surfaces to mitigate exposure to slips and trips.

The 175AT is equipped with a six-section, 13 – 60.1 m pin and latch greaseless formed boom and an optional three-piece (3 – 9.9 – 16.8 m) on-board hydraulic or manual offset fly and three 5.4-m lattice extensions. The maximum attachment will achieve a tip height of 96 m, making this crane suitable in many applications ranging from steel erection to cell tower service. The 3-m integrated heavy-lift fly provides robust capacities and line separation for two load line operation in applications like precast wall panels.

The 175AT will also feature the 'Sure Lock' fly erection system, which helps ensure proper fly erection and stowage sequence while minimising work at height. Link-Belt fly procedures have been embraced in the market on Link-Belt truck cranes and telescopic crawler cranes for their ease of assembly and one-person operation.

The 175AT transports to the job with full 36,700 kg of counterweight in just two overflow loads, making it quite efficient. With standard boom dolly provisions, including dolly camera, this crane was designed for travel in all geographical markets. The 175AT is capable of travelling under 12,020 kg per axle with 4,989 kg of counterweight on the crane and boom over the front. In dolly configuration, the counterweight can be stowed in several different configurations to meet different weight requirements. ■

Website: www.linkbelt.com



LEFT AND RIGHT: Link-Belt's new five-axle all-terrain crane, the 175AT, is said to be the company's most versatile and compact design yet. It is positioned to meet the demands and expectations of customers in all markets across the globe.

Goldhofer's Arcus PK makes world debut

Goldhofer has unveiled its new vehicle, the Arcus PK. This latest STZ-PK 8 low-loader semitrailer has been designed with a completely new steering system, combining friction-steered and forced-steered pendular axles. Developed by Goldhofer, the system ensures optimum steering control in all situations and thus prevents steering errors in forward and reverse motion and also reduce tyre wear to a minimum. The excellent steering geometry also takes the hassle out of narrow construction site entrances and offers considerable time savings.

In addition to the steering system, the Arcus PK features simplified handling of the front bogie, which can be quickly loaded onto the rear deck as an economical solution for empty running.

The Arcus PK is said to be one of the lightest vehicles in its class and comes with a low loading height of 790 mm. As such, it can handle heavy cargos weighing up to 130 t and more. And with the user-friendly SmartControl, all vehicle functions can be operated by the driver easily. According to Goldhofer, there has been an increase in the use of digital and electronic components to support vehicle handling in terms of both operation and maintenance for higher levels of safety and reliability. ■

Website: www.goldhofer.com



Goldhofer presented its new Arcus PK at the IAA Commercial Vehicles 2018 in Hannover, Germany. This new STZ-PK 8 low-loader semitrailer features a completely new steering system, to ensure excellent steering control in all situations.

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Liebherr to unveil new crawler excavators

Liebherr has given a sneak preview of its new range of crawler excavators, dubbed the Generation 8 - which is set to be launched at bauma 2019. In the initial phase, they will include six models: the R 922, R 924, R 926, R 930, R 934 and R 938. The R 922 and R 924 are available for high-regulated countries, while the other four will be available for both high- and lower-regulated countries. Offering operating weights of between 22 t and 45 t, the machines will cover an engine power range from 120 kW to 220 kW.

With an engine power increase for faster loading cycles, a heavier counterweight for higher bucket capacities as well as a minimum fuel consumption, the concept of the new generation incorporates several measures to improve profitability. The first six models are associated with three different modular platforms (R 922 and R 924, R 926 and R 930, R 934 and R 938). This approach allows common structures and shared components in the production.

A new equipment concept with a hollow moulded piece at the top of the boom is one of the innovative features of the new excavators. This leads to better performance with reduced operating weight of the machine. Another highlight is the optimised load curve, which results in less fuel consumption. For the maintenance-free travel gear and track rollers on the undercarriage, the reliability has also been enhanced with a lifetime lubrication concept.

The Generation 8 comes with a new lighting concept, using LED technology. This solution minimises electrical consumption and provides more powerful lighting. To facilitate day-to-day work, the ROPS-certified cab is equipped with a pneumatic seat with vertical and longitudinal damping, plus a user-friendly 7-in high-resolution colour touchscreen display that delivers important information – such as current levels of engine oil, hydraulic oil, fuel urea (diesel exhaust fluid), etc. The unobstructed panoramic view and the rear-view and lateral monitoring cameras enhance work safety. The adjustable console enables convenient and safe access to the cab.

The R 922 and R 924 crawler excavators, with operating weights of between 22 t and 24 t, mark the start of the new range and replace the models of the same name launched in 2013 with Stage IIIB engines. These two models are available for the high regulated markets, whereas the low regulated versions of these machines with Stage IIIA / Tier 3 / China III engines - also named R 922 and R 924 - were already launched in 2016.

The new R 922 and R 924 crawler excavators, with a Liebherr engine that conforms to Stage V, deliver power of 120 kW and 129 kW respectively - an increase of almost 10% in comparison with the previous generation. The engine does not have an EGR valve but is fitted with a diesel oxidation catalyst (DOC), an SCR system and particulate filter for reduced consumption and higher productivity. With such a system, there are no productivity constraints in case of malfunctioning exhaust gas recirculation valve (EGR) or eventual overconsumption of gasoline caused by EGR.

A standard heavy counterweight together with a higher bucket capacity, from 0.55 cu m to 1.65 cu m, also improves efficiency on the construction site. Thanks to a wide range of equipment and tools providing greater versatility, the R 922 and R 924 excavators can be used in earthmoving applications, trenches and piping, as well as in demolition works and special applications. The excavation forces, the traction force of the undercarriage and the swing



TOP AND ABOVE: Liebherr's new Generation 8 crawler excavators will be officially launched at bauma 2019.

torque of the uppercarriage, have all been considerably increased, between 5% and 25% compared with the former generation.

For easy maintenance, the machines' elements are accessible from the ground level. The fuel pre-filter, the fine fuel filter, the engine air filter and the housing for cab air filters are all accessible from the outside and the ground. For better safety during maintenance, the side access to the uppercarriage and maintenance platform have also been extended. ■

Website: www.liebherr.com

Sandvik develops new drilling tool systems

The new Alpha 360 drilling tool system from Sandvik is an improved and amplified version that complements the company's best-selling system, Alpha 330. With a reinforced design, the Alpha 360 can last twice as long as a standard thread in the industry, said Sandvik. Its hole accuracy also enables higher productivity in tunnelling and mine development.

The Alpha 360 is developed to deliver unprecedented performance and at the same time boost productivity in the whole drill-and-blast cycle. It is suitable for 48- to 51-mm-diameter hole sizes in face drilling and bolting, and it features a strong thread design. The short thread on the round rod gives superior resistance towards bending stresses, improved bit guidance and excellent energy transfer. The sturdy thread is guided inside the bit skirt, which leads to high precision collaring even in complex rock formations and against uneven surfaces.

Sandvik has also introduced its new Speedy bit – which is said to be the fastest drill bit in the industry. Apart from its 10% higher drilling speed (compared with a standard bit with ballistic buttons), the Speedy bit also provides great collaring accuracy and hole quality.

By increasing its drilling speed up to 10%, the Speedy bit can save users one hour per day for each drill rig. It is available in three dimensions: 45, 48 and 51 mm.



LEFT AND BELOW: The Alpha 360 drilling tool system is designed for 48- to 51-mm-diameter hole sizes in face drilling and bolting.



The Speedy bit, which features one of Sandvik's new PowerCarbide grades, outperforms the standard bits in the industry with aggressive buttons that penetrate deeper with each strike and increase cutting size, said Sandvik. The elevated front breaks the rock in two levels and improves the flushing flow, while large sludge grooves enable quick removal of bigger cuttings.

According to Sandvik, the Speedy bit has already proved its performance in the field during more than 20 trials in mine development and tunnelling; and on average, drill speed increased by 9% in contrast to bits with ballistic buttons, including several regrinds. ■

Website: www.rocktechnology.sandvik

BELOW: The Speedy bit is available in three dimensions: 45, 48 and 51 mm.



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New FlexLine series from Leica Geosystems

The Leica FlexLine series, comprising TS03, TS07 and TS10 models, is designed to improve productivity in the field by automatically capturing height. Replacing the former manual total stations (Leica FlexLine TS02, TS06, TS09 and Leica Viva TS11), the new series delivers reliability through extensive testing and comes standard with the latest in UX-focused software, Leica FlexField or Leica Captivate. Enabling quicker field-to-office data sharing, the TS07 and TS10 also offer integration of mobile data devices.

The AutoHeight system enables Leica FlexLine TS07 and TS10 users to automatically measure instrument height. The system uses a laser from the instrument to measure to the ground and automatically passes the right instrument height to the onboard software. It prevents time-consuming manual effort, minimises errors and increases productivity. ■

Website: www.leica-geosystems.com/flexline



The new FlexLine series of manual total stations from Leica Geosystems is designed to improve productivity in the field by automatically capturing height.

GCP offers new admixtures to improve concrete quality

GCP Applied Technologies has launched three new families of admixtures to reduce the stickiness of concrete. Adva LS, Adva Cast LS and Mira LS admixtures are formulated specifically for use in the production of ready-mix, precast and prestressed concrete, particularly high-strength concrete mixes that are prone to stickiness. The trio will help companies improve the operational productivity, efficiency and quality consistency of their mixes.

The three new admixture ranges are formulated with the latest polycarboxylate technology and are specially designed to reduce the stickiness of concrete, as well as the associated placement difficulties. They are particularly useful in both ready-mix and precast concrete with low water-to-cementitious ratios, high cementitious content and/or challenging aggregates mixes.

According to GCP, these new admixtures can be customised for different project requirements. Adva LS and Mira LS admixtures create mixes with improved rheology and good slump retention, while Adva Cast LS admixture can be used to create quality high-strength precast elements. The admixtures work well with a variety of raw materials, including stone fines, quarry dust, manufactured sand and other challenging aggregates.

They are suitable for customers in Asia Pacific, as high-strength mixes with high cement factors are increasingly common in this market, said GCP. The application of the new admixtures in these mixes makes them easier to pump, place and finish, which reduces on-site labour and improves schedules.

The use of Adva LS, Adva Cast LS or Mira LS admixtures also contributes towards sustainable construction, added GCP, because they enable the use of challenging and waste stream materials to produce high-performing, high-strength concrete that is more durable. ■

Website: www.gcpat.com



ALL IMAGES: GCP has introduced three new admixture ranges - Adva LS, Adva Cast LS and Mira LS - to reduce the stickiness of concrete. They are particularly useful in both ready-mix and precast concrete with low water-to-cementitious ratios, high cementitious content and/or challenging aggregates mixes.

Scania launches new generation of trucks in Singapore

The New Truck Generation by Scania, which is designed for long haulage, construction and urban applications, replaces the company's PGR generation that has been available in Singapore since 2006. It features design and technical improvements to the P-series, G-series and R-series cabs that were mainstays of the PGR generation. In addition, the new generation offers the new L-series and S-series cabs to complete the full range of options for Singapore customers.

The L-series cab is designed for urban applications – such as distribution, refuse collection and maintenance – in congested city conditions. It is a spacious low cab that puts the driver at the same level as other vehicles on the road. The S-series cab, the tallest in the range, features a flat floor and a high roof to maximise interior space and comfort for long-distance driving.

Scania has also introduced the XT range, with additional technical specifications built to enhance the robustness of trucks that work in rough terrains, such as construction sites. These include a high air intake to supply the engine with the cleanest air possible in dusty environments and a tow pin with 40-t towing capacity in the front to enable the truck to be pulled out quickly.

The XT range also features a sturdy steel bumper, skid plate and headlamp protection to withstand harsh working conditions. The addition of a fold-out service step in the bumper and an inspection step at the side of the cab, together with grab handles, further allows for safe and easy access to check the engine, body or cargo.

The new generation continues to adopt Scania's innovative modular system, where customers can customise their vehicle configurations according to their choice of cabs, engines and chassis. Scania has also designed the new trucks to achieve up to 5% reduction in fuel consumption on conventional Euro 6 diesel engines over the previous generation.

Apart from the advanced emergency braking system, the new generation has built in a number of new safety features. The repositioned front axle 50 mm closer to the front and a lower centre of gravity create a shorter overhang to reduce the degree of kneeling under heavy braking. The 30-in brake chambers for the disc brakes on the front axle, which is a basic configuration for long-haul vehicles, further guarantees good braking performance. These active safety features work together to improve braking distance by 5%, from 40 m to 38 m for a truck with a 40-t gross trailer weight assuming the same tyre and road conditions.

To enhance passive safety, the new generation introduces rollover side curtain airbags, which can potentially reduce fatalities from rollover accidents by up to 25%. The design of the steering column directly beneath the steering wheel is also intended to absorb impact energy and reduce impact force to the driver during incidents.

In addition, the interior ergonomics of the cab design increase comfort and functionality. The driver's view of the road is enhanced with a lower instrument panel and optimised A-pillars combined with the positioning of the driver 6.5 mm closer to the windscreen and 20 mm towards the side. Optional camera sensors and other warning systems are available to improve safety.

Customers can also leverage the connectivity of the trucks to use the Fleet Management System, for the real-time tracking of the trucks, and Fleet Care services, which outsources the service planning and fleet optimisation functions to Scania. These



ALL IMAGES: Scania has introduced the XT range - as part of its new truck generation - which incorporates additional technical specifications to enhance the robustness of trucks that work in rough terrains, such as construction sites.

connected services yield real-time data and long-term trends for fleet owners and operators to plan how to manage their vehicles and drivers. ■

Website: www.scania.com

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Cat hydraulic hammers ideal for tough applications

The Cat B-series hydraulic hammers, comprising B20, B30 and B35, are well suited to Cat medium excavator range (18 to 40 t). These hammers are designed for high productivity in a wide range of severe applications - such as quarry, road construction, demolition and general construction - while keeping the user's owning and operating costs at a minimum.

According to Caterpillar, all B-series hammers have been tested in accordance with ISO quality control system before customer delivery to guarantee optimum quality. Their top-mount style increases impact power by keeping hammer force and stick force in line. It also provides a larger work area and excellent operator visibility. Additionally, the top-mount bracket will transfer much less force and bending stress into the end of stick and have less impact on machine structures.

The Cat B-series hammers are targeted at LRC market and applications. Their speed/frequency can be easily adjusted to match material hardness, delivering increased productivity. The hammers' high-pressure accumulator is standard supply from factory and field serviceable. It helps protect the carrier hydraulic circuit by absorbing pulsation spikes created during firing stroke.

The hammers are also fitted with mounting brackets specifically built to Cat linkages, as well as the connecting lines and valves to match Cat implement hydraulic kits. Their full-length side plate design provides easy access to service points. Moreover, the superior field maintenance capability on tool and bushings plus field replaceable lower tool bushings are additional benefits for customers. ■

Website: www.caterpillar.com



Demolition		Applications	B20	B30	B35
Concrete Structure	Light weight	Walls, Roofs, Floors	Optimal	Recommended	Not Recommended
	Standard	Re-inforced Concrete <20"	Recommended	Optimal	Not Recommended
	Heavy re-inforced	Bridge pillars	Not Recommended	Recommended	Optimal
Masonry	Brick work	Walls	Optimal	Recommended	Not Recommended
Pavement	Asphalt	Driveways, Roads	Optimal	Recommended	Not Recommended
	Concrete	Road de-construction	Not Recommended	Recommended	Optimal
	Composite Surface	Road de-construction	Not Recommended	Recommended	Optimal
Rock	Trenching, utilities and pipelines	Not Recommended	Recommended	Optimal	

■ OPTIMAL
 ■ RECOMMENDED
 ■ NOT RECOMMENDED

TOP AND ABOVE: The Cat B-series hydraulic hammers, comprising B20, B30 and B35, are well suited to Cat medium excavator range (18 to 40 t). These hammers are designed for excellent productivity in harsh environments, such as quarry, road construction, demolition and general construction.

LEFT: The suitability of Cat B-series hammers for each application.

Hercules customised bearings to protect buildings

New bearing pads are being introduced by Hercules Engineering to help architects, engineers and builders safeguard construction projects against vibration, stresses and movement where beams are inclined at an angle from the supporting structure.

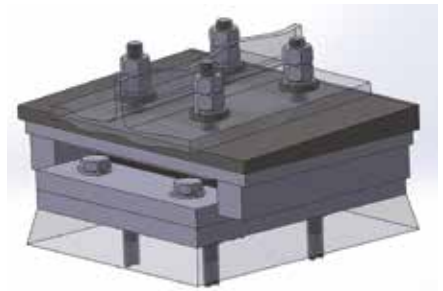
The Hercules taper plate bearings are custom-engineered for applications in commercial, industrial, community and large-scale residential buildings, where bearing surfaces have to accommodate stresses imparted by angled beams supporting structures such as airbridges, connections to car parks and roofing.

Instead of laying flat on horizontal or vertical planes, like more typical standard bearing pads, the new pads integrate into the bearing pads a custom-engineered angle plate of high-density polyethylene (HDPE) that can be machined to match the exact angle required to accommodate the beam resting upon it.

The customised HDPE plate, positioned above the bearing's sliding surfaces, offers a strong and long-lasting supporting surface integrated into the bolted structure it supports - but with an element of inherent flexibility lacking in angled steel plate alternatives.

According to Hercules Engineering, customised bearings such as taper plate bearings have been developed in response to requests for cost-efficient solutions to unusual architectural, structural, seismic, vibration and site other requirements. Challenges include ensuring that structures can flexibly cope with internal movement and stresses caused by heavy and changing loads, vibration and other common factors.

The angled bearings – available throughout Australasia and Asia Pacific – are an extension of Hercules Engineering's ranges of Hercules composite slip joints and Herculon low maintenance structural bearings. Hercules has provided its



Hercules' new bearing pads feature a flexible high-density polyethylene taper plate (depicted in black) that can be customised to different angles required for different commercial, industrial and large-scale residential projects.

products for use in structures as diverse as the Sydney Opera House, the Hang Seng bank in Hong Kong, Australia's New Parliament House in Canberra and one of the world's largest copper mines, Kansanshi, in Zambia ■

Website: www.herculesengineering.com.au

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New 'Open' applications from Bentley Systems

Bentley Systems recently launched the OpenSite Designer, a built-for-purpose application for the design and construction of civil site projects. The company also introduced OpenBuildings, bringing together its AECOsim building design and Speedikon factory and industrial design applications; and announced the availability of OpenBuildings Station Designer, a specialised application for designing rail and metro stations. At the same time, Bentley unveiled the OpenBridge Designer - which combines the company's bridge modelling, analysis and design capabilities into one comprehensive package - and OpenFlows Flood, a flood analysis and early warning system.

In addition, in pursuit of its 'industrialisation strategy', Bentley has rebranded under its 'Open' portfolio several of its applications based on MicroStation technology, which collectively accelerate the advancement of its comprehensive modelling environment by connecting digital workflows across disciplines and sharing digital components in its Connected Data Environment (CDE).

'Open' has three meanings, explained Bentley. First, it signifies open to multiple disciplines. Second, it means open to analysis and simulation. Using different applications, two different disciplines - for example, a geotechnical engineer and a structural engineer - can iterate on the same dataset in the company's comprehensive modelling environment, providing a 'digital feedback loop' and enhancing their collaboration across BIM workflows. And third, because MicroStation technology underpins Open applications, users can produce multidiscipline deliverables and accomplish multidiscipline clash resolution from any Open application.

The collaborative nature of digital workflows connecting analysis and simulation with design and modelling is exemplified in OpenSite, Bentley's new solution for the design and construction of civil site projects. OpenSite provides rapid site modelling and analysis, earthwork optimisation and quantification, drainage and underground utilities, and automated project deliverables.

OpenSite Designer

OpenSite Designer provides a comprehensive site design workflow including reality modelling, geotechnical,



OpenBridge Designer integrates the modelling capabilities of OpenBridge Modeler and the analysis and design features of RM Bridge, LEAP Bridge Concrete and LEAP Bridge Steel to meet the design and construction needs of both concrete and steel bridges.

underground utilities, stormwater drainage, terrain modelling, detailed drawing production and visualisation.

OpenSite Designer optimises design outcomes with multidiscipline information modelling and analysis. Interoperating with Plaxis, Bentley's newly acquired geotechnical engineering solution, site plans can be enhanced with new information about the active properties of soil including bearing capacity, stresses and displacement.

OpenBuildings Designer

The newly launched OpenBuildings Designer incorporates all of the capabilities of AECOsim Building Designer as well as Components Centre and a range of new capabilities and standards including EnergyPlus, a building energy model to help users comply with ASHRAE standards in the US, and UK energy requirements; support of international standards including IFC 2x3, IFC4 Reference View, COBie, and Singapore's Building and Construction Authority; new capabilities to design curtain wall systems; and OpenBuildings Speedikon, a leading application for industrialised design and construction.

OpenBuildings Designer takes advantage of collaborative digital workflows with other applications in Bentley's Open portfolio, for example templates in OpenBuildings Station Designer for tunnel segments created through Generative Components based on linear alignment from OpenRail.

OpenBridge Designer

OpenBridge Designer is a new, all-encompassing application that integrates the modelling capabilities of OpenBridge Modeler and the analysis and design features of RM Bridge, LEAP Bridge Concrete and LEAP Bridge Steel to meet the design and construction needs of both concrete and steel bridges.

OpenBridge Designer enables bridge designers to rapidly create an intelligent, parametric bridge model, fully integrated with analysis and design, as well as drawings. It enables seamless synchronisation of various disciplines for analysis, design, detailing, documentation, construction engineering and load-rating.

OpenFlows Flood

Bentley also announced the rebranding of its Haestad water modelling and Action Modulers flood analysis product lines to form OpenFlows for water districts, sewer utilities and flood plain managers. OpenFlows extends smart water networks capabilities with GIS-based asset-centric information for water loss reduction, water operations, flood prediction and prevention.

OpenFlows Flood continuously monitors watersheds, integrating data from real-time monitoring stations and numerical models to calculate risk levels. OpenFlows Flood mitigates flood risk, improving understanding of the processes involved in flood generation, and transmitting early alerts to reduce the impact caused by floods. ■

Website: www.bentley.com

Gomaco Xtreme GT-3600 curb and gutter machine

The Gomaco GT-3600 curb and gutter machine is now available with the company's Xtreme system. This new machine will be displayed for the first time at the upcoming World of Concrete exhibition in Las Vegas, USA, to be held from 22 to 25 January 2019.

The GT-3600 was the first three-track machine to slipform a 610 mm radius, and now with the Xtreme system on board, tight radius paving is easier and more efficient. The Xtreme system adds G+radius software with slew drives, smart-sensored hydraulics and intelligence to the Gomaco GT-3600.

Xtreme steering and ultimate intelligence has been added to each of the GT-3600's three tracks and includes rotary-sensored slew drives, sensed All-Track Steering and All-Track Positioning, and smart hydraulic cylinders. The Xtreme GT-3600's tracks can now rotate further than before. The smart cylinders allow the G+ control system to know the exact position of all three tracks so it can make steering adjustments as needed.

The G+ radius software allows the operator to programme the size of the radius into the controller. G+ calibrates and manages all the aspects of travelling around the radius, including track angles and individual variable track speeds. As the Xtreme GT-3600 approaches the radius, with the values already dialled in, the operator activates the radius programme, and the machine slipforms around the radius. The individual track speed control provides smooth machine travel around the radius. The G+ control system also easily interfaces with any of the major 3D



A Gomaco Xtreme GT-3600 slipforms curb and gutter on a cul-de-sac in a residential development. The Xtreme system adds G+radius software with slew drives, smart-sensored hydraulics and intelligence to the GT-3600 paver.

guidance systems for the same smooth corner.

In addition, a smart hydraulic cylinder is utilised for Intelligent offset when telescoping and sideshifting the mould mounting system. The smart cylinders provide G+ the ability of repeatable mould offset. The trimmerhead and mould have independent vertical adjustments as well for raising and lowering to work around jobsite challenges.

The Xtreme GT-3600 is equipped with the latest in Tier 4 technology. There is

also a new enhanced cooling package with a hydraulic fan controlled by G+. This G+ adapts the cooling needs to individual jobsite conditions for a quiet and efficient operation. Fuel efficiency has also been optimised and combined with an increased fuel capacity for an uninterrupted day of paving. Plus, the Xtreme GT-3600 is available with Gomaco Remote Diagnostics (GRD) for machine troubleshooting, diagnostic reviews, software updates, and more. ■

Website: www.gomaco.com



seab.tradelinkmedia.biz

Quicseal systems used for Malaysia luxurious hotel

Nestled in the heart of Kuala Lumpur (KL), Malaysia, and next to Kuala Lumpur Convention Centre (KLCC), the new Four Seasons Hotel was opened in July 2018. It is part of a mixed-use development that also has private residences and an upscale shopping complex.

The project was developed by Venus Assets Sdn Bhd, a KL-based developer of residential, commercial and mixed-use properties, with China Railway Construction Corporation (CRCC) as the main contractor. After stringent rounds of selections by the architects and consultants, Quicseal products were chosen for use in the project, including its latex admixture, tile adhesives and protection sheet.

The Quicseal 607 latex admixture (more commonly known as bonding agent) was used as slurry bond coat and key coat to apply on the concrete wall and floor during plastering and screeding works. By doing this, it greatly improves the adhesion and provides more flexibility to the installation area.

The Quicseal 602+604 - a highly flexible tile adhesive (EN Classification: C2TES1) - was used to install tiles and large-sized



natural stones for both the floor and wall areas in the lobby, corridor and guest rooms. In addition, the Quicseal 705



ALL IMAGES: The Quicseal 705 protection guard (left) and Quicseal 602+604 tile adhesive (below) have been applied at the new Four Seasons Hotel in Kuala Lumpur (far left).



protection guard – a durable, high quality, non-staining protection sheet - was applied to prevent newly-laid finishes from damage and scratches. ■

Website: www.quicseal.com

Large Sennebogen crane for small tunnels in Dubai

The National Plant company of Al Naboodah Group Enterprises has been tasked to build a new terrain in the Khawaneej area of Dubai, east of the international airport. The company is undertaking the job using the microtunnelling method, which involves trenchless pipelaying of 14 km of water pipes, sewage pipes and other supply pipes into the ground.

Among the challenges on the project are difficult soil conditions and hot temperature of over 50°C. The equipment, particularly the drill head and pipejacking machine, weigh up to 30 t and need to be lifted safely into the launch shaft. For this, a Sennebogen 6113 E telescopic crawler crane with a lift capacity of 120 t was chosen to carry out the work. The machine has been operating on-site for over two years. It is also used to lift the pipe sections into the shaft and remove the excavated material.

The project is expected to be completed by 2020, after which the crane will move



on to another construction site. ■

Website: www.sennebogen.com

ABOVE: The Sennebogen 6113 E crane being used for the construction of a new terrain in Dubai.

Herrenknecht TBM helps prevent flood in Singapore

A Herrenknecht S-975 EPB Shield was recently used by Tiong Seng Contractors (Pte) Ltd to bore two 1,000-m-long drainage tunnels in Singapore. The tunnel boring machine (TBM) has a shield diameter of 5,250 mm and torque of 2,739 kNm.

The final TBM breakthrough occurred in December 2017. The new tunnels expand the existing drainage system and will relieve the Singapore River in the long-term, especially during heavy rain, and thus reducing the risk of flooding in the country.

The new twin tunnels complement the existing 5-km-long Stamford Canal. Due to the inner-city location, the smallest possible diameter of 24 m was chosen for the round launch shaft. With such a limited space, the TBM was made to be as compact as possible. Its individual parts arrived just-in-time at the jobsite. Afterwards the machine was lowered carefully into the launch shaft, component by component, until it was ready for operation.

Upon completion of the first tunnel, the TBM was returned to its starting point in the launch shaft, where it then began excavation of the second tunnel tube. Featuring a 630-kW drive power, the Herrenknecht S-975 worked its way through complex ground conditions (highly weathered granite) and with small overburdens crossed under the busy inner city, surrounded by skyscrapers with shopping malls and apartments.

In 2010 and 2011 Orchard Road, which runs near the Stamford Canal, was repeatedly affected by major flooding because the existing drain could not accommodate the water masses during heavy rain and flash floods. In recent years, rains in Singapore have become heavier and floods more frequent, reports the National Water Agency. The expansion of the drainage system is designed to prevent this problem in future and relieve the Stamford Canal by up to 30%.

Additional challenges were posed by the short distance between the two tunnels and a tight curve radius of 180 m in the course of the alignment. As such, precision and intricate work was required. With shield articulation cylinders, the curve drive was continuously adjusted so that deviations were always within the tolerance. In this way, a continuous advance with top performances of up to 18 m per day and 91 m per week was possible. ■

Website: www.herrenknecht.com



The Stamford Diversion Canal project in Singapore consists of two twin tunnels, each about 1,000 m in length. A special challenge for the site crew was the 180 m curve radius.



ABOVE:
Herrenknecht's tunnel boring machine for the project has a shield diameter of 5,250 mm and drive power of 630 kW.

LEFT: After top performances of 91 m per week, Tiong Seng Contractors celebrated the final TBM breakthrough in December 2017.

Sime Darby provides support for Pan Borneo Highway

The Pan Borneo Highway (PBH) project was announced in 2013 by the Malaysian Federal Government, which aims to build a road network connecting the world's third largest island - Borneo Island including two Malaysian States, Sabah and Sarawak, with Brunei and the Kalimantan region in Indonesia. The construction works in Sarawak were officially launched in 2015 comprising 11 construction work packages, while the Sabah portion was launched in 2016 with another 35 construction work packages.

The Pan Borneo Highway acts as the backbone of road linkages in Sabah and Sarawak, and is expected to create multiplier effects in terms of tourism, infrastructure development and logistics by creating connectivity in areas previously difficult to access. The 2,325-km highway is anticipated to create 400,000 jobs with cost estimation of RM 29 billion upon its completion in 2023.

In the first half of 2018, over one third of the Pan Borneo Sarawak construction work packages were completed. Here, Sime Darby Industrial Sdn Bhd was involved by providing more than 150 units of Cat machines such as Cat hydraulic excavators, bulldozers and compactors, among others. One of the fleet owners is Musyati- Mudajaya JV Sdn Bhd, the main contractor for Work Package No.8 - which was named by PBH Sarawak on 3 October 2018 as the Best Overall Performing Works Package.

Moving forward, PBH Sabah, with work packages worth RM 12.8 billion will be the key project implementor of the Pan Borneo Highway, which will require substantial equipment and machinery. Sime Darby Industrial is set to provide further support for the project. ■

Website: www.simedarbyindustrial.com



ALL IMAGES: Sime Darby Industrial has provided over 150 Cat machines for the construction of Pan Borneo Highway. Once completed, the new 2,325-km highway will enhance connectivity on Borneo Island, linking Sabah and Sarawak in Malaysia with Brunei and the Kalimantan region in Indonesia.

Demag CC 8800-1 overcomes challenges in India

When Sarens was tasked to carry out a series of challenging lifts at the Ramagundam Fertiliser Plant in India, the company imported its Demag CC 8800-1 lattice boom crawler crane all the way from Greece to get the job done.

Commissioned by the RFCL (Ramagundam Fertilizers and Chemicals Ltd), through the project's EPC (engineering, procurement and construction) contractor, Bridge and Roof Company Ltd, Sarens was responsible for lifting heavy equipment at the construction of the Ramagundam Fertiliser Plant. The project involves the construction of a new ammonia plant and a urea plant with capacities of 2,200 t/day and 3,850 t/day respectively, as well as developing an ancillary offsite and utility facilities. In total, around US\$750 million (INR 50 billion) is planned to be invested into the project, which is scheduled for completion in late 2018/early 2019. It is expected to produce 1.12 mil t of urea annually.

Upon reviewing the project, Sarens quickly determined it would take a large crane, like its 1,600-t Demag CC 8800-1 crawler crane to complete the job. For the first, and one of the most challenging lifts, Sarens needed to lift a 425-t urea reactor into place. The company then shipped the CC 8800-1 to the Mumbai port, and transported it to the site using multiple trucks. To help set up the crane, Sarens also deployed a Demag CC 2800-1 lattice boom crawler crane. The company was able to safely assemble the machine in just seven days, despite facing space limitations.



The 425-t urea reactor measured 53 m in length and 3.8 m in diameter. To perform the lift, the reactor was upended with the Demag CC 8800-1 crane in an SSL 84/72 configuration at a lift radius of 24 m. The CC 2800-1 assist crane was used in an SSL 54 configuration. After lifting the reactor, the CC 8800-1 crane operator slowly slewed and walked the heavy load into position.

The 20-member crew battled rain, area constraints and narrow plant roads to complete the project's first erection safely and within the target schedule. Sarens also used the Demag CC 8800-1 to execute five more key component erections, weighing up to 640 t. ■

ALL IMAGES: The 1,600-t Demag CC 8800-1 crawler crane helps Sarens to carry out heavy lifting operations at the Ramagundam Fertiliser Plant in India.

Website: www.terex.com/cranes

SWINGING SIXTIES

LIUGONG SHOWS NO SIGNS OF SLOWING DOWN AS IT ENTERS ITS 60TH YEAR. THE COMPANY HAS LAUNCHED SEVERAL NEW PRODUCTS TO MEET A WIDE RANGE OF APPLICATIONS, INCLUDING THE 886H WHEEL LOADER, 990F EXCAVATOR, B170DL BULLDOZER, 4180D MOTOR GRADER AND TC800C5 TRUCK-MOUNTED CRANE.

The 886H is LiuGong's first-ever intelligent remote controlled shovel wheel loader. It features a combination of intelligent remote control and intelligent technology. The intelligent shovelling system enables the wheel loader to shovel independently as long as the operator controls the machine close to the stack. The operator only needs to lower the machine's arm to carry out the next shovelling operation. The intelligent loading system senses material penetration, has one bottom loading and dumping, along with an auto levelling bucket and controllable placement of the bucket.

The 886H is also equipped with an intelligent protection technology for automatic identification system and auto emergency stop. As a result, the machine is suitable not only for general applications, but also for dangerous environments such as rescue and disaster relief. Its remote-control technology makes it ideal to perform tasks in odorous or radiation environments. The operations can be observed from the videos that are sent back by the machine's cameras and the effective control distance is 2,000 m.

The Cummins QSM11 engine powers the LiuGong 886H. Two working modes of Standard and Economic can be switched easily according to working conditions for additional energy-savings. The newly optimised hydraulic system and power combination increase bucket breakout force and loading capacity. The intelligent throttle control system can automatically adjust the fuel input to maximise the power output and save energy.

The 886H has a spacious, 309° panoramic cab. All key buttons are within reach and the control handle can move with the operator's seat. The fully sealed and micro pressurised cab reduces dust and noise, creating a safe and comfortable environment for the operator. The front-flip hood can be opened and closed by hydraulic lifting system, providing extra maintenance space.



FROM TOP: LiuGong 886H intelligent remote controlled shovel wheel loader, 990F crawler excavator, and TC800C5 truck-mounted crane.

The LiuGong 990F crawler excavator is powered by a Perkins EFI engine with a rated power of 447 kW, combined with a 5.6 cu m bucket. The machine adopts an electronic controlling hydraulic technology, increasing working efficiency and lowering fuel consumption. With its reinforced short boom and arm, the machine is also able to work harder for a longer period.

A highlight of the 990F is the one-foot operation for straight walking. According to LiuGong, it changes the way of using two pedals together to drive the machine in a straight line. The left-right hand pattern change is also simple, improving job efficiency. The FOPS cab features reduced noise and with oil-bath pre-filter and LED lights, it is capable of operating in dusty or dim environments.

The 990F also has two independent cooling fans that are reversible for easy cleaning. Plus, walkways on both sides of the machine enable safe and easy access to the upper structure.

The LiuGong B170DL bulldozer features a modularised transmission system of European technology; the hydraulic system, single-handle pilot operation and one-button gearshift allow for smooth and stable operation. The Cummins engine provides stable power to the machine with three working modes - Power (P), Standard (S) and Economy (E) - to meet different application needs. The maximum productivity of P mode has increased by 31%, and the minimum fuel consumption of S mode has been reduced by 26%.

Designed by LiuGong Industry Design Centre in the UK, the B170DL has a spacious cab and its operating visibility has been greatly improved from both the front and rear of the machine, increasing the operator's blind-free spots by more than 10°. The multi-functional display board can show the machine's conditions at a glance, and the high-sealed and micro-pressurised cab reduces noise and dust.

The B170DL's new fuel tank increases the fuel volume by 20%, resulting in longer operation hours. More configurations and attachments such as laser levelling device are optional for the machine, helping customers to perform various tasks.

LiuGong's D-series motor grader – the 4180D – has also been designed by LiuGong Industry Design Centre. The machine's five-pillar cab provides a 324° panoramic view for the operator. The new frame structure is not only stable and reliable, but also allows for easy access to the gearbox and hydraulic pumps. The 4180D features a larger articulated steering angle with



LiuGong 4180D motor grader (above) and B170DL bulldozer (below).



greater flexibility. The new swing frame raises the oil cylinder to optimise the whole machine's structure and performance. For easy transport, the machine can directly board the truck by simply lifting the shovel.

The 4180D is highly manoeuvrable, intuitive and controllable. The console desk is adjustable and enables the operator to control multiple handles simultaneously. The shovel's conversion angle is controlled by a single cylinder to obtain wider cutting angles, making it more adaptive. The machine is also equipped with a laser automatic levelling device. The turning radius of the front axle is 50°, which is said to be the smallest in the industry. The engine hood is made of new macromolecule materials that are environment-friendly

and durable; using an electro-hydraulic lifting system, the hood can be lifted for easy service and maintenance.

LiuGong TC800C5 crane is designed with a five-section, U-shaped super-long boom with a full extension of 50.2 m - it is the longest among the same size class products in the industry, said LiuGong. The main boom has been tested for more than 10,000 hours to make sure it is safe and reliable, added the company. Outriggers transverse span of TC800C5 is up to 8 m, and the machine's total counterweight reaches 15.5 t leading to stable and precise control. The counterweight can be detached by a wireless remote control, making two people's job to be done by one person.

The crane's electrically controlled variable displacement pump, load-sensing valve with post compensation technology, combined with the advanced slewing system deliver smooth operation and rotation. In addition, the chassis is powered by a Cummins engine. The maximum speed can reach 85 km/h and the maximum gradeability is up to 46°.

60 years of excellence

LiuGong recently held its 60th anniversary celebration at its International Industrial Park in Liuzhou, Guangxi, China. The event took place in November 2018 and was attended by local and overseas customers, distributors, suppliers, government officials and many other guests. At the same time, the company organised its global dealer conference themed 'Innovation & Transformation - The Road for the Future,' and also celebrated the global production of its 400,000th wheel loader.

"Sixty years of passion, across changing markets and fierce competition. The spirit and core values of LiuGong, along with the idea of constantly creating value for customers, and making contributions to society have led LiuGong from a remote enterprise to an international enterprise," said Zeng Guang'an, chairman of LiuGong Group.

Established in 1958, LiuGong designed and manufactured its first modernised wheel loader in 1966. In the 1980s, the company launched its second generation wheel loader – the ZL50C, which later became an industry benchmark; designing the world's first plateau-type wheel loader, laying foundation for LiuGong's claim to be the world leader in designing and manufacturing of wheel loaders. In the 1990s, LiuGong started its R&D of excavators and soon it became one of the most important business segments for the company.

In early 2000s, the Chinese market embraced the first momentum after National Reformation and Opening-Up. LiuGong adjusted its commercial strategy to enter more products segments and expanded its business into eastern China. In 2003, the company developed its first overseas distributor in Morocco and started globalisation. A year later, LiuGong established its first overseas subsidiary in Australia and in 2007, the company set up its first overseas manufacturing plant (and overseas R&D Centre) in India.

In 2008, LiuGong entered crane business by acquiring Zhengchonganli Engineering Machinery Company in Bengbu. In 2010, LiuGong acquired Liuzhou



ABOVE LEFT: Zeng Guang'an, chairman of LiuGong Group.

ABOVE: LiuGong held its 60th anniversary celebration in November 2018.

LEFT: The company also celebrated the global production of its 400,000th wheel loader.

OVM, a world leader in prestressing products and technology. Following that, LiuGong bought into the piling foundation industry in 2011 by holding shares of Jintai, a China-based manufacturer of piling machinery, and also formed a JV with Cummins in Liuzhou. In 2012, LiuGong acquired the civil construction machinery business of HSW in Poland, offering a full line of bulldozers.

In 2013, LiuGong and Metso started a joint venture to produce mobile mining crushers and grinding mills and LiuGong took over an air compressor business in Liuzhou. In 2015, LiuGong launched National Earthmoving Machinery Engineering Research Centre and LiuGong Global R&D Centre. And in 2016, the company launched its revolutionary vertical lift wheel loader, creating a new class of machinery. In 2017, LiuGong's factory in Brazil opened and the company moved its new European headquarters to Warsaw, Poland.

During industry downturns, LiuGong took a series of quick actions like capacity adjustment, organisational reform, team optimisation, cost control, sustained input into technological innovation and product development internally and optimise the marketing channels externally. As the economy warms up, the company's excavator business becomes its growth

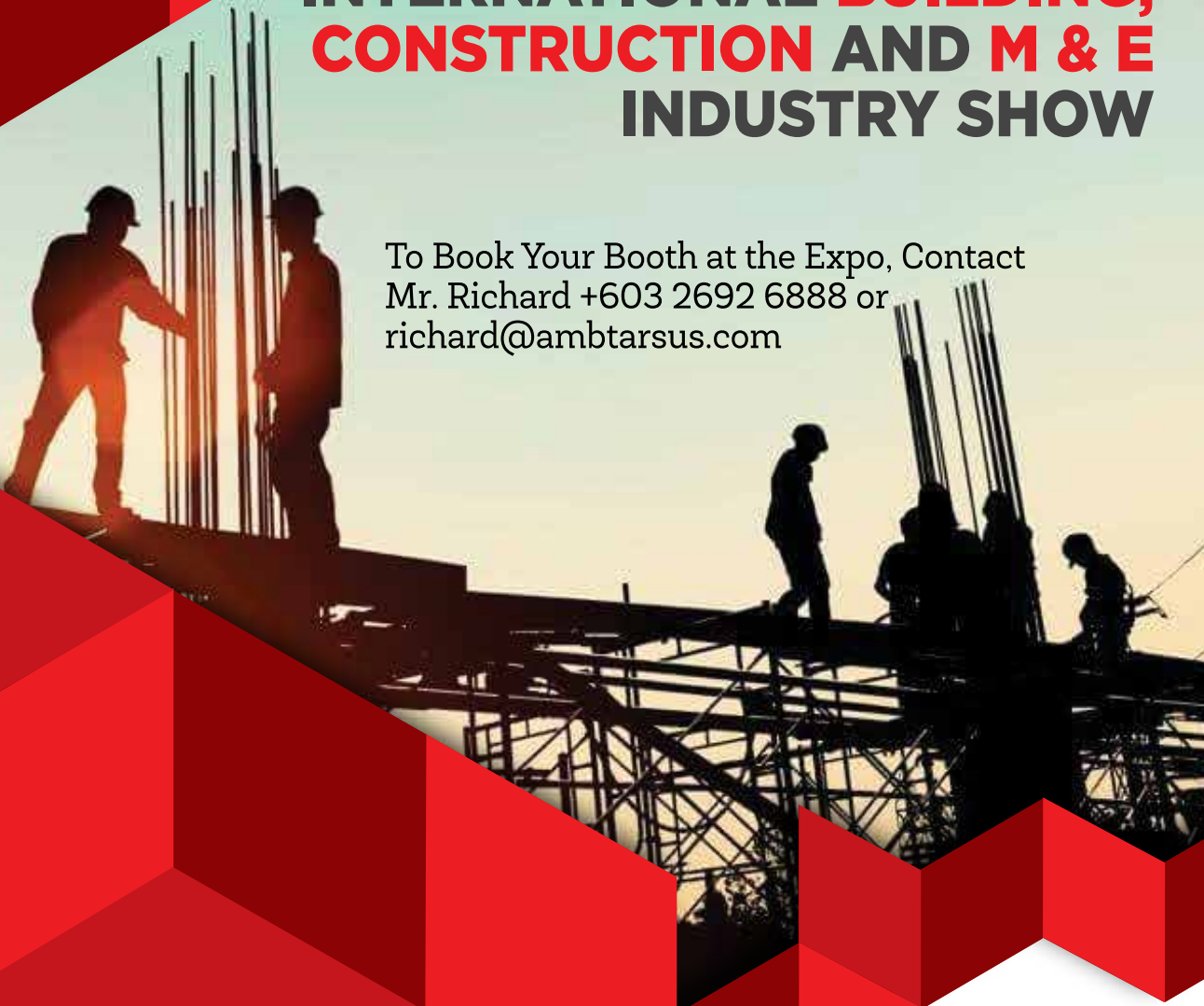
pillar with the highest revenue and profit. In 2018, LiuGong began carrying out intelligent manufacturing systems, mining machinery, forestry machinery and aerial work platforms. In conjunction with the big data and intelligent development, the company also promoted 'total intelligent' as a strategy.

David Beatenbough, LiuGong's vice president for R&D said, "LiuGong's Development Process (LDP) not only ensures our products are exactly what markets need, it enables the accumulation of LiuGong's R&D outcomes and speeds up the transition into machine design and the upgrading of LiuGong products. It also provides solid and vast knowledge for the cultivation of LiuGong's new engineers."

LiuGong has also managed to seize the opportunities brought by the One Belt One Road (OBOR) initiative. The company said it covers more than 85% of the 65 key OBOR countries and regions, and has also participated extensively in construction projects along OBOR - such as the 3rd Bridge and national power plant projects in Turkey, Ashdod Port and Tel Aviv light rail construction in Israel, China-Laos and China-Thailand railway construction, the PMK expressway in Pakistan and the China-Myanmar gas pipeline project, to name a few. ■

Website: www.liugong.com

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THE FUTURE OF MACHINE CONTROL

THE CONSTRUCTION INDUSTRY IS UNDERGOING A DIGITAL REVOLUTION, ALLOWING USERS TO CARRY OUT JOBS FASTER, EASIER AND MORE ACCURATELY. LEICA GEOSYSTEMS RECENTLY HELD ITS OPEN WEEK EVENT IN SINGAPORE TO SHOWCASE A WIDE RANGE OF SOLUTIONS THAT HELP DRIVE THIS SHIFT. AMONG THE HIGHLIGHTS WAS THE COMPANY'S ALL-IN-ONE 3D MACHINE CONTROL SYSTEM, WHICH TRANSFORMS THE WAY THAT HEAVY EQUIPMENT OPERATES.

One system for all machines

The all-in-one 3D machine control system from Leica consists of the MCP80 panel, MDS docking station and MC1 application software that supports multiple machines for heavy construction. This new solution automatically guides the operator to position the machine, resulting in higher quality and accuracy.

The Leica MCP80 panel displays information about the work in progress and automatically positions the tools, such as bucket, blade or drill bit to dig, grade or drill. The panel integrates into a common software platform, Leica MC1. Machine specific data, like calibration values and hydraulic parameters, are stored in the Leica MDS docking station.

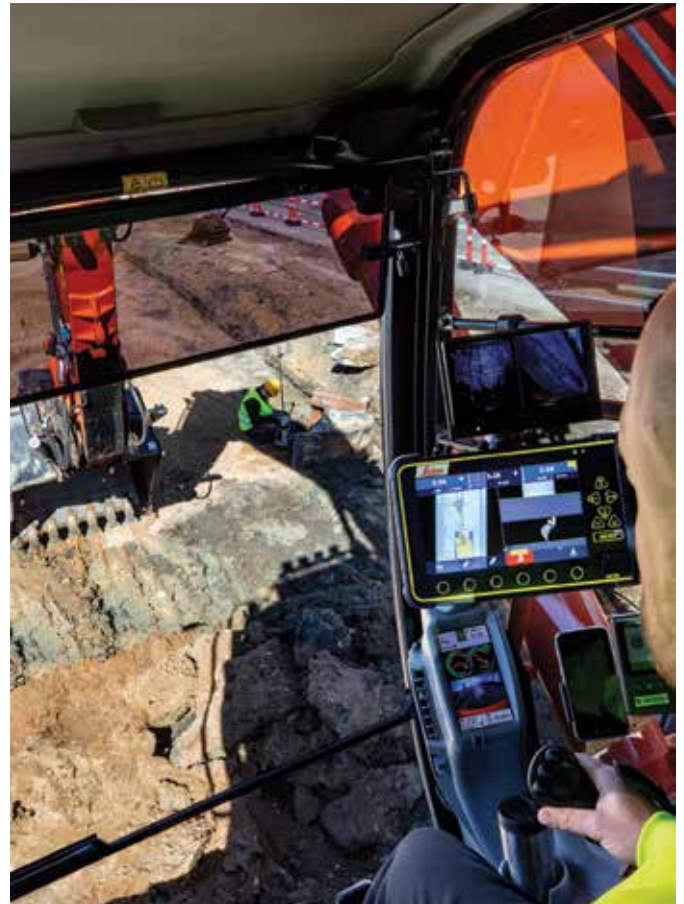
“With automation, operators can accurately guide, position or control a machine to improve efficiency and productivity, thus reducing operating costs, optimising material use and improving site safety,” said Owen Williams, segment director for Asia at machine control division of Leica Geosystems, part of Hexagon AB. Mr Williams’ market responsibility covers Southeast Asia, Japan and Korea.

“Starting in early 2018, Leica Geosystems has launched the MCP80 hardware with the MC1 software, which allows many machine types to be utilised under one software platform. This is unique and particularly important for rental companies,” said Mr Williams. “We will introduce the full array of machine types in a phased basis, such as pavers, compaction rollers, excavators, wheel loaders, bulldozers, graders, scrapers, skid steers, drilling and piling rigs, and even snow grooming equipment.”

As the new system is interchangeable between these heavy construction machines, various users - from machine control operators to dealers - just need to be trained in one 3D panel. They can switch from one machine to another and build complex designs with simpler workflows and less down time.

The MCP80 panel has a 20-cm (8-in) touchscreen with 3D and 2D simultaneous views. It features a robust design to withstand the harshest environments, and is able to operate in temperatures between -30 and +60 Celsius. IP66 and IP67 rated, the panel is protected against dust and water penetration. It is also cable-free, as it is fixed to the on-cabin mounted Leica MDS10/20/30 cradle that handles all cable connections.

The MCP80 hardware was introduced in early 2017 and according to Mr Williams, both the new MC1 software and current



ABOVE: The all-in-one 3D machine control system from Leica automatically guides the operator to position the machine, resulting in higher productivity and accuracy.

LEFT: The system consists of the MCP80 panel, MDS docking station and MC1 application software that supports multiple machines for heavy construction.



iCON 3D and Visual software can be loaded to the panel.

“Machine control awareness is growing in Southeast Asia. Specific projects like Singapore Changi Airport have put a spotlight on machine control with several grading and paving systems being utilised, while larger construction projects are engaging both machine control and machine guidance (manual control),” explained Mr Williams.

“Across Asia in general, governments understand that they need to improve productivity due to ageing workforce and lack of experienced operators for machine control. Thus, related productivity analysis becomes an important facet of modern construction process. For example, over the last five years the push for ICT (Intelligent Construction Technology) in Japan has led to rapid increase in machine control and machine guidance solutions.”

Moving to digital age

Mr Williams further pointed out that companies around the world are changing

the way they work and innovate. “Construction is one of the least productive markets globally, with companies making very small profit margins. Increasing productivity is therefore key, in order to reduce costs and become more efficient.

“Many companies still work traditionally with 2D paper plans. Even today 3D data experience is limited, so those that develop the skill sets quickly will have an advantage. The ultimate goal is that the construction data can be supplied to the machines in full 3D digital design, removing the need for tedious tasks on site.”

“The challenge at the moment is getting the design data,” revealed Mr Williams. “Large companies that have this design data are still supplying to site in 2D paper form. The workflow needs to change from the root. If we can push digital concepts throughout the construction cycle, we will enable the digital revolution. We can see this movement happening worldwide with the mandate of BIM. Singapore, as an example, is following suit but it seems harder for smaller companies to change



Owen Williams, Asia segment director at Leica's machine control division, is seen here during the Singapore Open Week 2018.

rapidly. It doesn't need to be the case, as the latest technology is extremely intuitive, easy to use and a lot more accessible than most people realise.”

“Leica Geosystems is well positioned to help educate and assist in bridging the gap in the Asia region,” said Mr Williams. “There is a need for companies to move to the digital age, and those that cannot change could be left behind!” ■

Website: www.leica-geosystems.com

SINGAPORE OPEN WEEK 2018

The first Singapore Open Week organised by Leica Geosystems took place in September 2018, showcasing a wide range of innovations that focus on survey and engineering applications. These included GNSS and total station survey solutions, machine control systems, 3D laser scanning solutions and more.

One of the highlights was the Digital Realities Experience, which provided visitors the opportunity to learn about the rapidly developing Reality Capture industries through seminars hosted by Leica experts. Visitors also learned about the latest hardware and software solutions from the world of 3D laser scanning and mobile mapping during hands-on demonstrations.

The event was attended by Leica's partners and customers from Singapore and across Southeast Asia. It offered educational presentations, hands-on demonstration sessions, and a tour of Leica facility. ■



ALL IMAGES: Leica held its Singapore Open Week 2018 to showcase a wide range of solutions, focusing on survey and engineering applications.

GIRL POWER

CATERPILLAR SINGAPORE TOGETHER WITH ITS DEALER - TRACTORS SINGAPORE LTD – RECENTLY WELCOMED A GROUP OF SECONDARY SCHOOL GIRLS FOR AN INTRODUCTION TO THE WORLD OF ENGINEERING AND CONSTRUCTION.

The 'A Day in Steel Boots' programme, organised by Caterpillar Singapore and Tractors Singapore, invited about 30 school girls from Yishun Town Secondary School for an overview of the engineering and construction industry. The event took place at Tractors Singapore's headquarters on Benoi Sector, where the students learned how digital and other advanced technologies are being used in state-of-the-art construction machines and customer services. The students also had the opportunity to operate Cat machines on a jobsite located in Kranji area, which would help them get closer to engineering and construction in real life.

Bridging the gender gap

According to Caterpillar, this hands-on programme aims to attract more girls and women to the engineering and construction industry, supporting diversity in STEM (science, technology, engineering and mathematics). "As children's career aspirations are influenced through learning and observing others, not only is STEM in the classroom important, but also mentoring by female professionals in these fields as they make for great career role models," said a company spokesperson.

Jeffrey Hardee, Caterpillar's Singapore country manager, highlighted that while the number of female employees at Caterpillar has been increasing over the years, they are still underrepresented in general. "That's why we initiated this programme, so that girls can acquire some knowledge of engineering and construction, particularly the manufacturing side of it, from an early age and hopefully it inspires them to pursue a career in the industry or with Caterpillar," said Mr Hardee. "We also want them to feel comfortable, able to express themselves and think out of the box."

"Workplace diversity is one of the factors that has contributed to Caterpillar's success," he added. "Having a diverse workforce in the company certainly enhances our culture."



ABOVE: The 'A Day in Steel Boots' programme was organised by Caterpillar Singapore and Tractors Singapore to encourage more girls and women to join the engineering and construction industry. Here are some of the students who took part in the event, pictured with Jeffrey Hardee, Caterpillar's Singapore country manager (back row, in the centre).

MIDDLE: Caterpillar and Tractors Singapore introduced their companies, and also shared some knowledge of manufacturing.

LEFT: The students also learned how digital and other advanced technologies are being used in state-of-the-art construction machines and customer services.

'Women can do well'

"Through our programme, we want the young generation - especially girls - to know that manufacturing sector offers a lot of opportunities in STEM," explained Mr Hardee. "Our technology is already sophisticated due to digital innovations, such as data analytics, AI (Artificial Intelligence), robotics, 3D printing, and more - all of which help to manufacture equipment best suited to our customers. We believe women can do well in this profession!"

One of the students taking part in the event commented, "This programme offers a great opportunity for us girls to get exposed to the engineering and construction industry, and it empowers us."

Another student expressed a similar view, saying, "After what we've learned just now, I think the industry is not only for men. Anyone can do it as long as they have an interest in the job."

Speaking about challenges, Mr Hardee pointed out that society needs to overcome the stereotype of the industry. "People always think that engineering and construction is more suitable for men, so women wouldn't typically think they can operate a machine or design a machine, or even be involved in the sale of machines."

"By having such an event, we're trying to break the stereotype around the industry. As an organisation, we play our part in the community, helping to improve the awareness in the industry."

Alan Ow, managing director of Tractors Singapore Limited (TSL) echoed the same sentiments, "We are honoured that Caterpillar chose TSL as their partner for this engagement as we have the same values and belief. Like Caterpillar, TSL is also a strong believer in workplace diversity."

"We have females filling different scopes around our office, from design engineer to service engineer to sales representatives, and they have made many meaningful contributions to the company. Through such activities, we hope to change the society's perspective and attitude towards females in the construction industry."

Caterpillar has also held similar programmes in Japan, India, Europe and the US. "It has been successful in Japan, while in India, we also offer a technician skills training course where girls can choose to become equipment operators," revealed Mr Hardee. "In Singapore, Caterpillar has collaborated with several universities on professional attachment programmes."

"We'd like to urge women to look at the engineering and construction industry closely - there are many roles they can do here," encouraged Mr Hardee. "Without a doubt, the industry is quite exciting,



with plenty of opportunities. You can help construct the entire infrastructure, which is so important to how we live and

function. It also creates a lot of economic opportunities for the world. In a nutshell, we are building a better world!" ■



ABOVE: Tractors Singapore gave a tour of its factory to provide the students with a better understanding of manufacturing process.

LEFT AND BELOW: The students also had the opportunity to operate Cat machines on a jobsite, which would help them get closer to engineering and construction in real life.

For more information:

Caterpillar: www.caterpillar.com | Tractors Singapore: www.tractors.com.sg | Yishun Town Secondary School: www.yishuntownsec.moe.edu.sg

INDIA HOMES GO PRECAST

In the capital city of Chhattisgarh state, Naya Raipur, the government has decided to build 40,000 housing units for the lower income segments with precast technology. The first contract was awarded to the Indian construction company BSBK Group for 6,300 housing units. The company was required to design the building and infrastructure, and complete the project as a whole. Construction work is currently ongoing.

“The best technology is precast technology,” said V.R. Chetty, vice president of BSBK Group. “You have to construct so many houses within such a short time period, so there will be a huge requirement of labour, which is not possible. Secondly, there’s issue with quality: compared to conventional systems, the quality of precast technology is much better.”

Finnish precast technology

BSBK has executed a wide variety of projects in civil steel engineering, industrial and public buildings, hospitals, roads and bridges. However, the Naya Raipur project is different as it has a time frame of just 36 months.

“This is a turnkey project, which includes the design and construction of the building along with the associated facilities,” explained Shirang Gupta, business development executive at BSBK. “Seeing the quantum of construction required and the short time frame, we decided to go for precast technology.”

Finnish precast technology supplier Elematic understood BSBK’s requirements and proposed its Semi precast plant, which consists of Semi floor and Semi wall line. The plant came to the expected budget and produces precast elements as per daily production requirements.

Usually it takes at least six to seven months to install and commission a precast plant - but due the tight time frame, the precast plant in Naya Raipur was installed in record time, said Elematic. Manufacturing of moulds and machinery in India and Finland started in March 2016 and the plant was completed in August 2016.

“The plant was partially supplied from India and till the time Finnish machinery arrived, Indian machinery and tables were installed. It helped them to start production in record time,” said Sumedh Gupta, business development manager at Elematic.



BSBK Group is currently constructing 6,300 housing units in Naya Raipur, India. The company was required to design the building and infrastructure, and complete the project as a whole.

With a time frame of just 36 months, BSBK has opted for precast technology from Elematic to carry out the job quickly and efficiently.





Semi floor and wall lines

The precast plant at Naya Raipur consists of Elematic Semi hollow-core slab line with four beds, an extruder and a sawpreparer as well as a Semi wall line with 20 tilting KVT tables, 15 mechanical tables, staircase moulds and casting skips. The total concrete volume produced every day is around 150 cu m.

“Semi floor line is an ideal investment to start with precast construction, because it does not involve much automation but still produces high-quality panels,” said Mr Gupta (Sumedh).

Semi lines offer an effective alternative that can efficiently produce up to 600 sq ft per day, and production does not require in-depth knowledge of the staff, according to Elematic.

“Earlier, if one had large-scale precast production requirements, either they had to go with individual hydraulic tables or a circulation line which requires a bigger initial investment and skilled labour for operations,” continued Mr Gupta (Sumedh). “Once Elematic introduced the Semi production lines for precast walls and floors, it became possible to start using precast as a building method without any big investment to the production equipment.

“With Semi wall line, all the tables are manufactured in India and only the wagon is being imported from Finland. It helps to reduce lead time and requires a lower initial investment.”



TOP: BSBK chose the Elematic Semi precast plant to produce precast wall and precast floor panels. These panels are later transported to the jobsite for installation.

ABOVE AND LEFT: The Semi wall line can produce various precast wall panels such as load bearing walls, facades, sandwich wall panels and solid panels.



ABOVE: V.R. Chetty, vice president of BSBK Group.
LEFT: BSBK precast plant.

Semi wall line can produce various precast wall panels such as load bearing walls, facades, sandwich wall panels and solid panels. The line consists of tables and a special KVT wagon that takes care of compaction, vibration and tilting operations and caters up to 20 tables easily.

'It may help to solve India housing crisis'

In order to understand how precast technology works, BSBK attended seminars and international exhibitions in China and India (Mumbai and Bangalore). The company's directors also went to actual sites to see and understand what type of machines would suit best for their needs.

"In the field of precast technology and equipment, Elematic is pioneer. The machines and service are very good. It is also a very important factor that Elematic has a proper technical support team," said Mr Chetty.

"After purchasing it, we are satisfied with the performance of all the machines," added Rohit Singh, vice president for plant and machinery at BSBK Group.

The future of precast technology looks bright in India and it may be able to help solve the country's housing crisis. Already around 24 million houses are reportedly planned to be built with precast technology.

"We would like to set up more advanced plant for precast technology, and to provide more jobs, so that we can expand the precast technology in a proper way and gradually enter the private sector too," said Mr Chetty. ■

Website: www.elematic.com



ABOVE AND LEFT: The Semi floor line at BSBK features a hollow-core slab line with four beds, an extruder and a sawpreparer. According to Elematic, its Semi lines offer an effective alternative that can efficiently produce up to 600 sq ft per day, and production does not require in-depth knowledge of the staff.

The Rialto Bridge after completion of the renovation works.



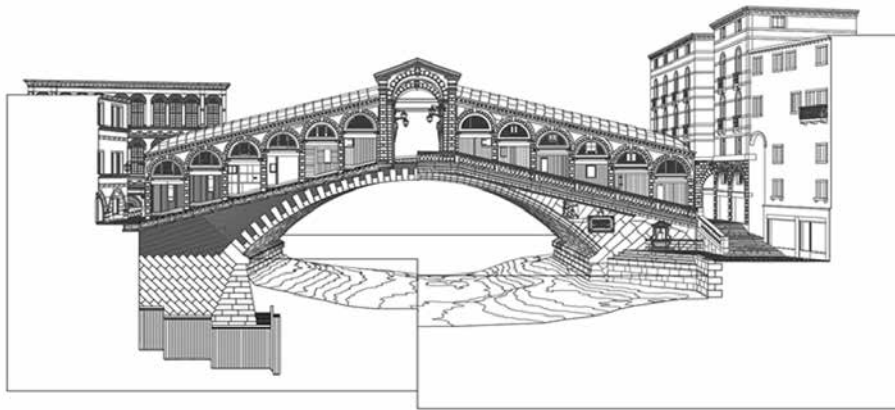
RESTORING RIALTO BRIDGE

IN AN ATTEMPT TO PRESERVE THE WORLD-FAMOUS RIALTO BRIDGE IN VENICE, ITALY, THE VENICE CITY COUNCIL RECENTLY REPAIRED THE STRUCTURE TO PROTECT IT FROM FURTHER DETERIORATION, WHILE MAINTAINING ITS FUNCTIONALITY AS WELL AS ITS HISTORICAL AND ARTISTIC SIGNIFICANCE.

Icon of Venice

Along with the Accademia, Scalzi and Costituzione bridges, Rialto is one of the bridges crossing the Grand Canal in Venice; it is also the oldest and most famous of the four. The original bridge was made up of a series of boats and was called Quartarolo, the name of the coin used to pay the toll. This was replaced during the 12th century by the first fixed structure, a bridge designed by engineer Niccolò Barattieri that was supported by wooden posts.

At a later date, the bridge was strengthened and widened with the addition of two lateral ramps that could be raised to allow boats to pass through and, from then on, it became known as Rialto Bridge – named after the area in which it was built, Rivoalto. The bridge was destroyed by fire in 1310 and then rebuilt, only to collapse again in 1444 under the weight of hundreds of spectators watching a boat parade. It was rebuilt again, but this time it was wider and had small stores along its two sides.



LEFT: The drawing shows a front view of the Rialto Bridge, originally designed by Antonio Da Ponte.

BELOW (LEFT AND RIGHT): The bridge was recently repaired to prevent further deterioration. Mapei's various systems were used for strengthening the balustrades, waterproofing the arcades (pictured here), preparing the installation bed for the steps, pointing the joints of the stone immersed in water, and installing stone slabs.



Following another collapse in 1524, it was decided to rebuild the bridge using Istria stone, an ivory coloured material particularly resistant to atmospheric agents and saltwater. After considering other proposals by Palladio, Vignola and Michelangelo, the local authority opted for a design by the Venetian architect, Antonio Da Ponte. Work commenced in 1588 and the bridge was completed three years later. It has a single, 28-m-wide span and all its weight is supported by foundations made up of 12,000 elm piles and larch planks which, to this present day, still bear the load of the 24 small stores on the bridge.

Restoration works

Over the years, the bridge has been partially restored on several occasions and has also had new piping installed, but there had never been the need for such extensive and significant structural work.

A recent analysis and survey of the bridge was carried out, which highlighted that the structure itself and the foundations were still in good condition, while the balustrade and parapet running along the two sides of the bridge were badly cracked and were in such a critical condition that they posed a safety risk for users of the bridge. Also, the walls of the small stores were in poor condition and their external stone masonry facades had become detached from the internal brickwork.

Once the survey and analysis of the problems had been completed, work got underway in 2015. Scaffolding was erected to create a raised area so that it would not interfere with pedestrians passing over the bridge. The work was divided into separate lots in order to keep the bridge open to pedestrians and work on the pavements, excavation work and the disposal of waste material were mainly concentrated in the night shifts.

The structural work was divided into two distinct areas, involving the balustrades and the facing walls of the stores. In

the first case, the parapets were consolidated by adding duplex stainless-steel mantels and carbon fibre strengthening strips and cords; while for the second area, basalt fibre strengthening cords were used to tie in the stone walls and the brick walls.

The upper face of the bridge was then waterproofed with an elastic membrane to allow for the bridge's slight, natural movements. Further work was carried out to clean the stones that form the lower face of the arched section of the bridge, the sides of the bridge, the parapets and the so-called Masegni stones – or large blocks of trachyte from the Euganean hills – used to make the pavements of the bridge.

The larger, heavier stones were removed, numbered, cleaned and then stored in a specially prepared site in a nearby square. The small columns of the balustrades were also removed, numbered and restored. They were then set in place with molten lead and, once the lead had solidified, they were tapped into their final position; the same columns had previously been set in cement, which had caused the damage.

The final step was to remove all the dirt and pollution (layers of biological matter, graffiti and a thick, black crust), which also demonstrated how the aggressive cleaning operations carried out in the 1970s had scratched the surface of the Istria stone.

Various Mapei systems

The first aspect to take into consideration for the restoration of the bridge was its historical, architectural, construction and cultural significance. The objective for the design engineers was the restoration, maintenance and arrangement of the entire structure, in order to stop the bridge from deteriorating any further and bring it back to its original look.

Apart from preserving the materials and treatments applied over the centuries to combat wear and tear of the bridge, the



ABOVE LEFT: The balustrades of the parapet along the bridge were consolidated by injecting them with Mape-Antique I. After that, Maperod G pultruded glass fibre rods were inserted into the guide holes.

ABOVE RIGHT: The stone slabs were bonded with Mapei Adesilex PG2 adhesive.

aim of the work was to remove all the deteriorated elements and features, treat them to stop any ongoing deterioration and put them back into their original place, and prevent other forms of deterioration in the materials.

According to the static survey of the bridge, the vaulted roof was found to be compliant with current static safety norms and standards and sufficient to support the design loads. The readings taken in the small stores showed that minor but effective strengthening work was required by adding a chain at the start point of the arched sections.

The restoration work on the Rialto Bridge was carried out by three contractors - Setten Genesisio, Lares Srl and Lithos Srl. Various products from Mapei were chosen to help strengthening the balustrades, waterproofing the arcades, preparing the installation bed for the steps, pointing the joints of the stone immersed in water, and installing stone slabs.

To consolidate the balustrades of the bridge parapets, it was recommended to inject them with Mape-Antique I in order to strengthen the structure and improve its mechanical strengths. Maperod G pultruded carbon glass fibre bars, characterised by their high tensile strength, were then inserted into the guide holes.

The installation bed for all the steps on the bridge was formed by applying a layer of Mape-Antique NHL mortar. This is a high-performance mortar for transparent render and masonry work, based on natural hydraulic lime and Eco-Pozzolan. The product is classified as GP according to EN 998-1 standards and as G according to EN 998-2 standards.



ABOVE (LEFT AND RIGHT): The joints between the stones immersed in the waters of Grand Canal were pointed by injecting Stabilcem binder admixed with Mapeplast UW.

A layer of Mape-Antique Strutturale NHL mortar was also applied on the arches of the bridge and the surface was treated with a coat of Primer SN two-component, solvent-free epoxy resin-based primer before applying Purtop HA two-component polyurea waterproofing membrane by trowel. This product is part of the Purtop line of products and features high resistance to chemicals, high elasticity and high tear strength.

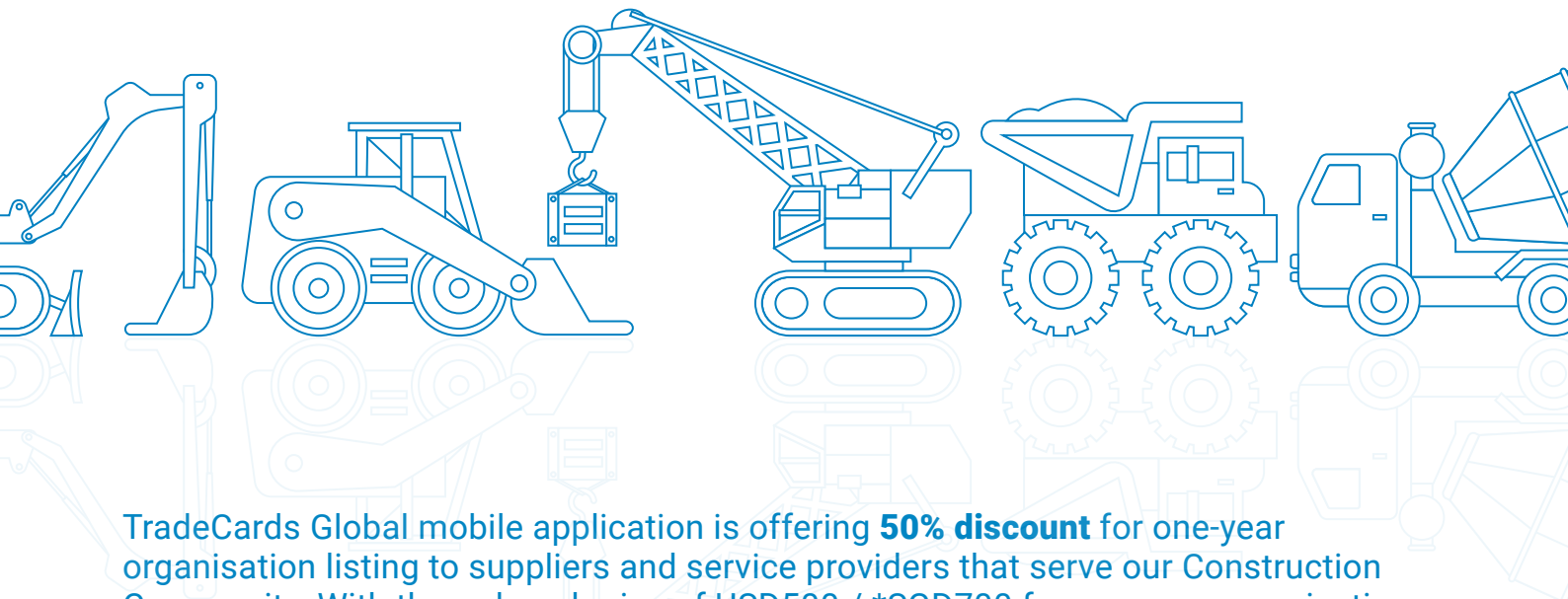
For some of the work on the roof of the stores, Mapei proposed Mapeplan waterproofing membranes from Polyglass (its subsidiary). The joints between the stones immersed in the waters of Grand

Canal were pointed by injecting Stabilcem - very fluid expanding cementitious binder - admixed with Mapeplast UW anti-washout powdered admixture that has been specifically developed for underwater concrete. In the areas of pavement that needed to be structurally strengthened, the stone slabs were bonded and sealed with Adesilex PG2 two-component thixotropic epoxy adhesive for structural bonding.

The newly renovated Rialto Bridge was officially inaugurated in May 2017 to coincide with the 57th edition of the Venice Biennale International Architecture Exhibition. ■

Website: www.mapei.com.sg

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WHAT LIES BENEATH

AS THOUSANDS OF COMMUTERS SWARM ALONG THE ROADS AND PAVEMENTS OF EGLINTON AVENUE IN TORONTO, CANADA, FEW OF THEM ARE AWARE OF THE MAJOR CONSTRUCTION WORK GOING ON MANY METRES BELOW THEIR FEET. *SOUTHEAST ASIA CONSTRUCTION* RECENTLY VISITED THE EGLINTON CROSTOWN LIGHT RAIL TRANSIT (LRT) PROJECT, WHICH, WHEN COMPLETE, WILL PROVIDE 19 KM OF FAST, RELIABLE SERVICE ON TRACK COMPLETELY SEPARATED FROM TRAFFIC.

The new rapid transit service offers a capacity of 15,000 passengers per hour in either direction, with an average speed of 28 km/hr including stops. It has 15 stations and 10 surface stops along Eglinton. Owned by Metrolinx, the service is operated by Toronto Transit Commission (TTC) as Line 5 on its rapid transit network.

Crosslinx Transit Solutions (CTS) - a consortium of ACS, Aecon, Ellis Don and SNC Lavalin – is the main contractor established to deliver and maintain the Eglinton Crosstown LRT. The company will design, construct and finance the 25 stations and stops, the tracks and signals, and the maintenance and storage facility. It will also maintain the LRT system for 30 years.

The tunnel boring operation on the project began in 2013 with four tunnel boring machines (TBMs), and finished in 2016. A total of 12 stations are being constructed using the cut-and-cover method, where excavation is started then covered. Work continues underneath while traffic flows above. Three stations (Laird, Avenue and Oakwood) are being constructed using the mining method, where excavation is finalised at the entrances and then caverns are drilled from the bottom of the excavation towards the centre of the roadway to create the station.

As of October 2018, all stations were under construction. Excavation at all three mined stations has been completed, with mining now underway; while excavation at all cut and cover stations were either underway or completed. Construction was beginning on the 9-km surface section from Laird to Kennedy. In addition, the Eglinton Maintenance and Storage Facility (EMSF) was completed and ready to receive first vehicles. Tunnel construction and fit-out (electrical, communications systems) were finished; and track installation was nearly completed at EMSF, and underway in tunnels.



ABOVE AND LEFT: The Eglinton Crosstown Light Rail Transit is currently under construction. BELOW: The new rapid transit service will have 15 stations and 10 surface stops.





An artist's impression of Eglinton Station. As an interchange station, it will be one of the busiest on the Crosstown.

Eglinton Station

Eglinton Station will be an underground station located at the busy Yonge Street and Eglinton Avenue intersection. As an interchange station, it will be one of the busiest on the Crosstown, and will provide a direct connection to the existing Eglinton Station on Line 1.

Construction of Eglinton Station commenced in mid 2016 and is scheduled for completion in 2021. The cut-and-cover method is being used here, which means excavation is performed then covered with wooden decking while crews continue digging and building underneath. The excavation will reach a depth of approximately 20 m, about the height of a six-storey building.

Avenue Station

Avenue Station will be an underground station located at the Eglinton Avenue West and Avenue Road intersection. It will be a turnback station, featuring special trackwork to store and short-turn trains.

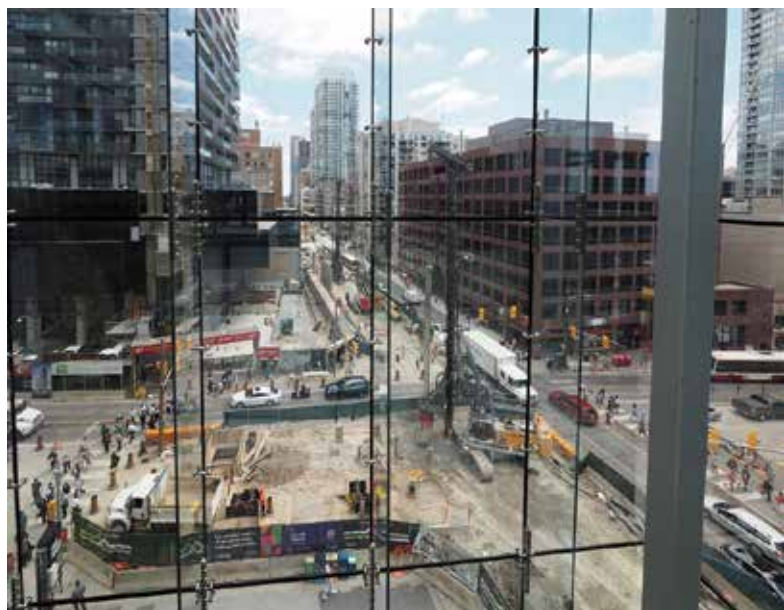
Construction of Avenue Station began in mid 2016 and is scheduled for completion in 2021. It is being built using the mining method, and will be the deepest of all the Crosstown stations, reaching a depth of 32 m at the northwest entrance. Once excavation is complete, a cavern is mined towards the centre of the road from each entrance, joining together to form the concourse and platform. Mining work commenced in early 2018 and is expected to finish by early 2020.

Among the machines used in this project is a Liebherr R924 Compact excavator – which was delivered in November 2017 and is expected to be on site for three years. Weighing 33,500 kg, it uses three different buckets including a ripping bucket, a standard excavation bucket, and a smooth grading bucket.

The Liebherr R924 has a quick coupler with a special tunnelling boom that rotates from side to side. The machine has been designed for tunnelling operations featuring reinforced panels, extra operator protection, fire suppression system, read and side cameras, as well as a purpose-built undercarriage.

“The R924 was chosen as it had the best specifications for digging tunnel. It fits inside and could turn around, and has very high digging and breakout forces. Liebherr is also available to provide the most efficient service to the customer,” said Jake Gowland, district sales manager at Liebherr-Canada.

According to Tim Petersen, managing director of Liebherr-Canada Ltd, almost all divisions of Liebherr’s business are involved



TOP AND MIDDLE: Eglinton Station will be an underground station located at the busy Yonge Street and Eglinton Avenue intersection. The cut-and-cover construction method is being used here, which means excavation is performed then covered with wooden decking while crews continue digging and building underneath.

ABOVE: A Liebherr LB 36 drill rig helping to build Eglinton Station.

in this construction project at one point over the estimated 25 year long. “Our mobile, crawler and tower cranes, deep foundation equipment, earthmoving machinery as well as our expertise in levelling subway trains have all been involved in this project to date.”

Liebherr-Canada has operations in nine locations across the country, spanning six time zones. In this market, the company offers a broad product range to customers from many industries and business sectors including: mining trucks and excavators, earthmoving equipment, concrete technology, deep foundation equipment, mobile and crawler cranes, tower cranes, maritime cranes, components, aerospace and transportation technology as well as household appliances.

Furthermore, Liebherr-Canada also remanufactures Liebherr components for Canada, USA and Mexico. The company’s remanufacturing department (Reman) provides a variety of solutions for customers: exchange, overhaul and rebuild or repairs.

“In 2023, Liebherr-Canada will reach its 50-year milestone. For this date we are committed to the goal to represent all Liebherr products in Canada as a complete mixed sales company while reaching C\$500 million in annual sales,” stated Mr Petersen. ■



An artist's impression of Avenue Station.



ABOVE: Avenue Station will be an underground station located at the Eglinton Avenue West and Avenue Road intersection. It will be a turnback station, featuring special trackwork to store and short-turn trains.

BELOW: The station is being built using the mining method, and will be the deepest of all the Crosstown stations, reaching a depth of 32 m at the northwest entrance.



ABOVE AND LEFT: The Liebherr R924 Compact excavator working on the project. The machine uses three different buckets - a ripping bucket, a standard excavation bucket, and a smooth grading bucket - and has a quick coupler with a special tunnelling boom that rotates from side to side.



For more information:

Eglinton Crosstown LRT: www.thecrosstown.ca | Liebherr: www.liebherr.com

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**LET'S
ROCK
W
ROLL**

TOP AND ABOVE: The Hard Rock Hotel & Casino currently under construction in Florida, USA, will be the world's first guitar-shaped building, featuring 125 m in height.

Construction of the new Hard Rock Hotel and Casino in Florida, USA, is in full swing. When completed in 2019, it will be the first-ever guitar-shaped building in the world. Standing 125 m tall, looking like two guitars set back-to-back, the hotel will have 638 rooms. Vertical slats along the tower's centreline resemble strings, and horizontal dividers are reminiscent of a guitar's frets.

Designed by Klai Juba Wald, the new complex will feature 38 storeys housing the hotel plus a hard-rock concert hall seating 6,500 and incorporating its own TV studio and broadcasting centre. It will also boast a wellness area and spa with a floorspace of just over 31,000 sq m, along with restaurants and retail facilities covering 5,600 sq m. The casino will have a new poker salon measuring 1,672 sq m and 3,000 new slot machines.

The project is being developed by Seminole Gaming and Hard Rock International. Contractor on the project is Suffolk Construction, and concrete contractor is Liberty Baker JV.

Formwork solution

Doka's SCP Super Climber self-climbing formwork and working platform is used on the project. Any floor plan can be formed quickly and flexibly with this modular formwork system for high-rise cores. At the touch of a button, high-performing hydraulic cylinders climb wall formwork – Doka's Top 50 large-area formwork – and working platform to the next pouring section in a single lift.

"One of the main advantages of working with Doka's Super Climbing system is that the pump is included in the system, avoiding extra work and unnecessary movements. The fact that everything is connected you don't have to worry about weather conditions, work can keep flowing and your people are safe on the system," explained Ronal Esquivel, project manager at Liberty Baker.

Besides configurations with anchoring to the structure on both sides (as in shafts), there is also an extended solution that makes it possible to transfer the forces on one side only. As such, the system is easy to use where there would not otherwise be enough walls, or where there are openings in the opposite walls. For even faster cycle times, the reinforcement operations can be performed above the platform. The system allows the working platforms that reach deep down into the shafts to be suspended, so that the crew can start carrying out finishing jobs while the concreting works are still ongoing.

What's more, the SCP Super Climber offers a high level of safety for the entire jobsite. Fully enclosed workspaces enable work to proceed in safety and without adverse effects from inclement weather. There is plenty of space on the platform for setting down reinforcement and site equipment. Apart from the SCP Super Climber and Top 50, Doka also supplied its Framax Xlife and Frami Xlife framed formwork systems. ■

Website: www.doka.com



Doka has supplied a variety of formwork systems to help complete the project.



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BAUMA CHINA 2018 CLOSES WITH A BANG



© Messe München

b auma China 2018 - held from 27 to 30 November at the Shanghai New International Expo Centre (SNIEC)—attracted 212,500 visitors (an increase of 25% from 2016), 94% of which came from Asia, with the top 10 countries being China, Korea, Russia, India, Malaysia, Japan, Taiwan, Thailand, Indonesia and Singapore.

The show drew a total of 3,350 exhibitors from 38 countries (an increase of 13% from 2016) and covered 330,000 sq m of space, including two new halls. There were eight international pavilions, comprising Germany, Italy, Spain, Turkey, USA, Korea (two pavilions), and for the first time a European pavilion.

“2018 was a special year!” said Stefan Rummel, managing director of Messe München GmbH, the show organiser. “In the exceptional market environment in China this year, bauma China demonstrated why it has every reason to be called the leading trade fair for the Asian construction machinery market. It set records in all areas, and clearly showed where this industry is heading: smart, digital and more sustainable technologies are the future.”

Qi Jun, chairman of China Construction Machinery Association added, “bauma China 2018 was very successful. It has made history in many aspects: the number of exhibitors, the exhibition space and the total volume of orders made on site.”

A larger number of intelligent, digital and green products were seen at the show, including electromobility and driverless vehicles – which are expected to set the future trend.

One such product was Caterpillar Next Generation series. The company’s Next Generation of large excavator models have taken a huge leap forward and boosted efficiency by up to 45%. Caterpillar made a comeback at bauma China, after years of absence. “The time was right for us to return to bauma China, as we wanted to introduce our Next Generation excavators to the global audience. This is the first major global trade show for our Next Generation machines,” said Damien Giraud, vice president of Global Construction & Infrastructure (GCI) Division at Caterpillar, speaking shortly before he took up a new role to lead the company’s Global Aftermarket Solutions Division within SD&D.

Volvo Construction Equipment also returned to bauma China unveiling its latest innovations. The company’s Co-Pilot has introduced a high-resolution touchscreen that acts as co-operator. It provides



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unlimited access to standard Volvo assist functions to collect real-time operational data. In addition, Sany presented an excavator that can be operated remotely with the help of virtual reality. In the process, the operator has the impression that he or she is sitting behind the wheel.

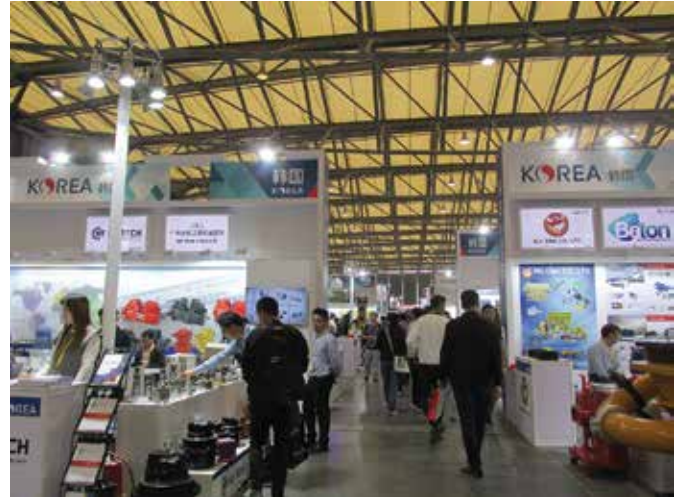
Asia gathering

With most of visitors coming from Asia - especially Southeast Asia - bauma China is clearly a favourite trade show in the region. "We've seen many international visitors at the show - particularly from Asia. Those who are not able to attend bauma in Germany, they would come here instead," said Penny Lau, managing director of SAS Asia Bar Systems Pte Ltd based in Singapore. Mr Lau and his colleagues were visiting bauma China to assess whether the show is suitable for the company's business. "We have been participating in a number of trade shows across Asia and this time, we came to bauma China to see it for ourselves - so that we can decide if we should take part next time - and we are definitely considering it."

Other visitors that *Southeast Asia Construction* talked to - including rental companies from Indonesia, Malaysia and Egypt - also said that bauma China provides an excellent venue for them to meet up with their principals and find new products for their customers.

Many exhibitors were equally pleased with the attendance at the show. "This time bauma China is better for us than it was two years ago," said Rob Galbavy, marketing manager of ChemGrout, a US-based manufacturer of grouting equipment. "In addition to visitors from mainland China, we've also had more visitors coming from different parts of Asia, like Hong Kong, Myanmar and the Philippines."





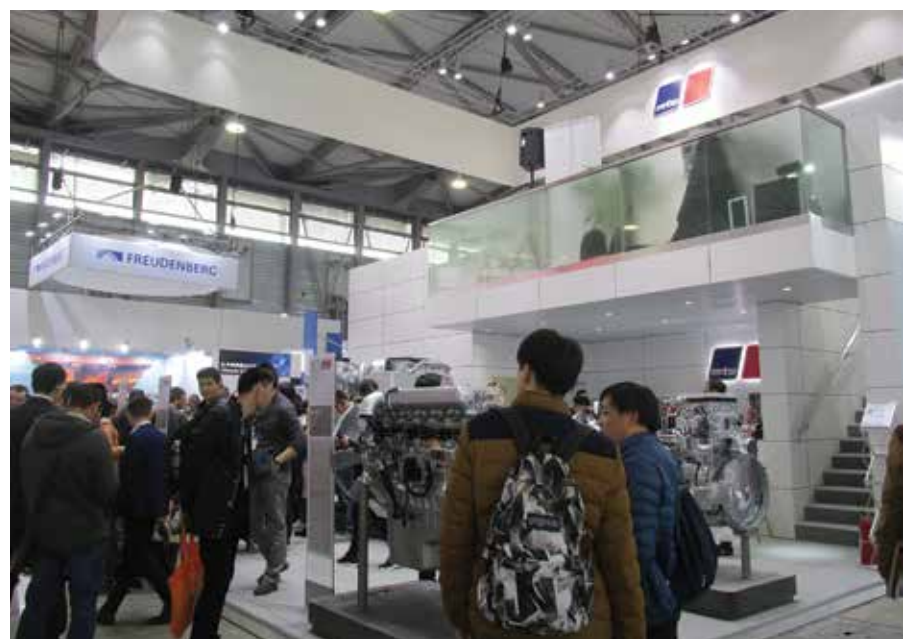
Another exhibitor, Trimax Machinery based in Singapore, was also satisfied with the result. “International visitors formed a significant percentage of the total number of people who stopped at our booth. More importantly, we received visitors from our targetted markets including Australia, Vietnam, Philippines, Thailand, Pakistan, Indonesia, Malaysia, India and Fiji,” said Sebastian Lua, managing director of Trimax Machinery.

Canadian aerial platform manufacturer Skyjack echoed the same sentiment, “We’ve been busier at the show this year (2018) compared with the last edition, with visitors coming from all over the world including Australia, Vietnam, Korea and the US,” said Malcolm Early, vice president of marketing at Skyjack. “Generally speaking, Asia has been growing very well for us and in fact, last year was our record year in the market.”

German manufacturer of road construction equipment Bomag also agreed. “Our impression of bauma China 2018 is very good. We have had many customers visiting our booth, showing a high interest in our machines and technology. Most of the customers were from China of course, but we have also had visitors from Southeast Asia and Russia,” said Jonathan Stringham, vice president for strategy, marketing and digitisation of Bomag.

‘One Belt One Road’

One of the main topics of discussion at bauma China was the One Belt One Road (OBOR) initiative – also known as the Belt and Road Initiative (BRI) - a development strategy by the Chinese government to enhance connectivity between Asia, Europe and Africa. Many exhibitors have expressed their support for the programme.



“The growth in China has been nothing short of spectacular, and initiatives such as the Belt and Road strategy adopted by the Chinese government are bringing about a transformation in the economic, industrial and infrastructure development landscape. We are pleased to be able to play a contributing role by introducing our world-leading capabilities in building diesel and gas engines as the country continues to drive towards success,” said Tobias Ostermaier, president for Greater China at Rolls-Royce Power Systems, which owns the MTU-brand of engines.

John Garrison, president and CEO of Terex Corporation added, “Despite the higher competition among manufacturers, OBOR will certainly create opportunities for Terex and we’re in a good position to join the projects along OBOR due to our competitive advantage.”

Volvo CE also supports the initiative, saying that “While political instability, climate change and technological breakthroughs are continuing to influence the global economy, it is Volvo that is standing firm and fully equipped to adapt to this changing landscape and support in China’s world-renowned construction projects, including One Belt One Road (OBOR).”

The Fayat Group further highlighted that “China and Asia Pacific are clear strategic markets for Fayat and over the short and medium terms they are clearly good reasons for optimism for growth. The OBOR will drive demand for good quality roads and highways, and ports and cities along the OBOR route. We are proud to be able to showcase an array of our state-of-the-art technology that is of relevance to the Chinese and Asia Pacific markets.”

Important deals and partnerships

bauma China also serves as an ideal place for companies to network and strengthen their relationships with business partners and customers, as well as to reach important agreements.

For example, XCMG reached milestone deals with leading international companies, including a US\$100 million cooperation agreement with Russia’s KBA Mining Company (KBA). Another event was the signing of sales agreement between Singapore-based company Tiong Woon Corporation and Terex Cranes for the delivery of a boom booster kit for Tiong Woon’s Demag CC 8800-1 crawler cranes.

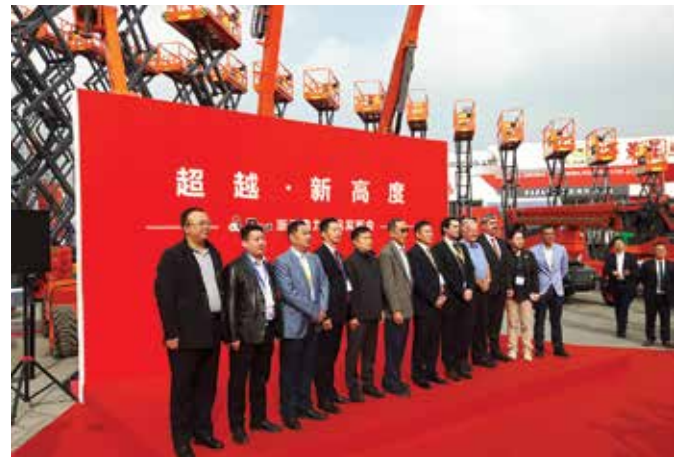
Manitowoc Cranes invited customers, dealers, end users and media to a specially-arranged event during bauma China to present its largest topless Potain tower crane. A group of special guests were also welcomed to the company’s factory in nearby Zhangjiagang to look at the new crane.

In addition, Spanish crane manufacturer Comansa organised an open-house event a day before the show. The company invited business partners, mainly from Asia, South America and the Middle East, to visit its facility in Hangzhou, about 175 km away from Shanghai.

The next bauma China is scheduled to take place at the Shanghai New International Expo Centre from 24 to 27 November 2020. ■

Website: www.bauma-china.com

ALL IMAGES: The outdoor and indoor areas of bauma China 2018, as well as some events that took place during the show.



The following pages cover several of the exhibitors and their products that were showcased at bauma China 2018.

ALLEN ENGINEERING

The SE12 Razorback truss screed from Allen Engineering features an eccentric shaft vibration system and steel frame construction. It has a maximum width of 19.8m, lowest concrete slump of 7.6 cm and maximum consolidation depth of 20.3 cm.

Some of the highlights of the SE12 include a quick disconnect system, low profile engine option, optional hydraulic powered winch, triangular frame with vibration proof welds, bolt-on replaceable blades as well as replaceable, greaseable bearings.

Allen's Razorback truss screed is designed for precision levelness, high rigidity and durability. The company said it is preferred by contractors when high tolerance F_L Numbers are specified on concrete floors and pavements. ■

Website: www.alleneng.com



BOTH IMAGES: The SE12 Razorback truss screed.

SAKAI

Japanese manufacturer Sakai introduced its SW888 and SW988 vibratory tandem rollers. They feature a centrifugal force that can be set at five different levels, and a maximum vibration frequency of up to 4,000 vpm, allowing the machines to handle a variety of hot mix asphalt (HMA) types and rapid, large-scale construction projects.

The curb clearance is 750 mm, enabling compaction right up to the edge of curbs. The front and rear drums are each equipped with a water sprinkler pump and a spray bar, as well as a backup water sprinkler pump. The spray bar is covered with a windshield that can be opened and closed, ensuring the wetting of the vibration drums and preventing the asphalt from sticking to it.

The original emergency brake pedal is capable of stopping the machine in an emergency situation, resulting in excellent safety. The engine is mounted on the front frame for easier maintenance and operator comfort. In addition, the optional Exact Compact Meter allows easy judgement of appropriate impact spacing. ■

Website: www.sakainet.co.jp



Sakai SW888 vibratory tandem roller at bauma China.

MTU

Rolls-Royce showcased its full range of MTU power systems at bauma China, and also demonstrated its commitment to the market. The engines under MTU brand on display included MTU Series 1100 and 1300, as well as MTU Series 2000 and Series 4000 - all of them are designed to meet stringent global emission standards.

The establishment of MTU Yuchia Power based in Yulin City in the Guangxi Zhuang Autonomous Region (GZAR) focuses on building MTU's Series 4000 engines, which are designed for use in the oil & gas and power generation industries. The company, which has a capacity to produce 1,500 engines per year, rolled out its first engine in April 2018 and is now already in serial production.

"The growth in China has been nothing short of spectacular, and initiatives such as the Belt and Road strategy adopted by the Chinese government are bringing about a transformation in the economic, industrial and infrastructure development landscape," said Tobias Ostermaier, president for Greater China at Rolls-Royce Power Systems.

"We are pleased to be able to play a contributing role by introducing our world-leading capabilities in building diesel and gas engines as the country continues to drive towards success. With our new China organisation, our commitment to invest further in people and infrastructure in China and our strong intention to build local partnerships shows we are here to contribute to key development projects across the country."

Rolls-Royce also brings to China a strong capability in driving export business, especially when pairing high-performance, economical MTU diesel engines below 500 kW that meet China IV non-road emission standards with China-built construction and industrial equipment. One success story from these partnerships is Xuzhou Construction Machinery Group (XCMG). Over the last two years, XCMG has exported over 100 units of MTU engine-powered all terrain cranes ranging from 60 to 300 t to Canada, Poland and Turkey.

Rolls-Royce currently has more than 250 staff under its MTU



ABOVE AND BELOW: A variety of MTU engines on display at bauma China.



ABOVE: Trucks equipped with 16V 2000C66 MTU engines working on an open pit mine in China, providing almost round-the-clock productivity in extreme temperatures, harsh conditions and a low-oxygen environment.

RIGHT: Over the last two years, XCMG has exported over 100 units of MTU engine-powered all terrain cranes to Canada, Poland and Turkey.



business in China. The company also recently set up an MTU customer care centre in Suzhou, Jiangsu province – it is the fourth MTU customer care centre globally and the first one in China.

In addition, Rolls-Royce is investing heavily in MTU customers' digitalisation journeys through Go! Act and Go! Manage and its efforts in advancing connectivity. These digital solutions are designed to directly integrate MTU's customer care and service network into fleet management tools. This allows customers to leverage smart analytics and other digital technologies to maximise uptime, as well as optimise lifecycle costs of their products under MTU ValueCare Agreements. When made available, customers can use these tools to proactively prevent equipment failure and conduct intelligent troubleshooting. ■

Website: www.mtu-online.com

ALLU

The Allu Transformer-series consists of an excavator/loader/tractor mounted processing bucket that screens, pulverizes, aerates, blends, mixes, separates, crushes, feeds and loads materials. It is ideal for processing concrete, waste, soil, sand, rocks and minerals on site.

The Transformer-series includes the compact DL- and D-series as well as the M- and G-series. The latter have proved themselves on quarrying and surface mining applications throughout the world, being designed for use by excavators up to 300 t. The models on show at bauma China were the Transformer DH 3-23 X75 drums; Transformer DS 3-23 (with TS 25 mm standard blades for screening); and Transformer DS 3-12 with 60 mm drums.

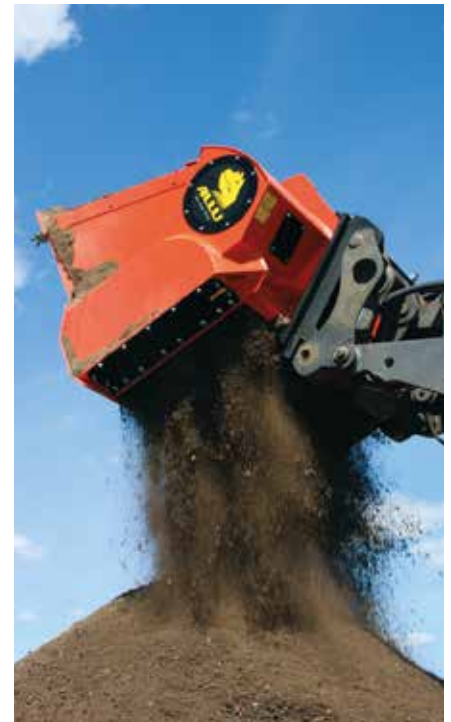
In addition, the Allu 500HD Processor is a hydraulic power mixer attachment that converts any excavator into a powerful and versatile mixing tool, which is capable of penetrating and effectively mixing a variety of difficult materials. Such materials range from clay, silt, peat, sludge and sediment, to dredged material and contaminated soil.

The 500HD is designed to work to a depth of 5 m with a weight of 2,445 kg (+400 kg fabricated mount plate). The Processor is powered by the excavator's hydraulic system, making it able to reach difficult or soft areas. Binders or chemical agents are delivered to the area of the highest mixing shear by an attached 80-mm-diameter pipe.

The Allu Processors are suitable for constructing temporary roads, solidification



ABOVE: Allu 500HD Processor is capable of working to a depth of 5 m.



ABOVE RIGHT AND RIGHT: Allu Transformer bucket can screen, pulverize, aerate, blend, mix, separate, crush, feed and load materials.



and soil remediation projects, dealing with contaminated soil, excavation and pipeline works, as well as oil ponds and sand acid tar. ■

Website: www.allu.net



seac.tradelinkmedia.biz

TRIMAX MACHINERY

Trimax Machinery, headquartered in Singapore, highlighted its innovative products including the Trent 48-36 jaw crusher and ADplus 2612 vibrating screen.

The Trimax Trent 48-36 jaw crusher has been designed and engineered to deliver a reliable, high performance in primary crushing applications. Built with operator in mind, it features hydraulic wedge closed side setting (CSS) adjustment as standard. This results in improved productivity and less downtime for the quarry.

The machine is also equipped with FAG Germany bearings to ensure the operator will receive years of reliable service. According to Trimax, each Trent jaw crusher is installed with upgraded larger sized bearings to withstand the toughest operating loads and pressures. A versatile integral motor base is also incorporated into its design to reduce the need for greater space and longer v belts.

The Trimax ADplus 2612 vibrating screen offers a field-proven heavy duty design using bended steel side plates, which prevent warping during prolonged stresses. The machine also has vertical stiffening angle bars that add rigidity to its already rugged construction.

The spring-controlled centrifugal counterweight assembly's innovative feature eliminates excessive resonance motion when the vibrating screen is starting or stopping. It is able to accelerate to optimal operating speeds with a smaller driving torque and drive motor, when compared with the standard fixed counterweight design. Amplitudes of circular motions can be varied by increasing or decreasing the number of counterweights bolted to the counterweight arms on either side of the centrifugal counterweight assembly. For better reliability and performance, the ADplus 2612 is also equipped with FAG Germany bearings as standard.

Both the Trent 48-36 jaw crusher and ADplus 2612 vibrating screen were quite popular with visitors, said Sebastian Lua, managing director of Trimax Machinery. "The frequent comments we received were that they were impressed and our machinery was very well built."

Trimax joined bauma China 2018 for the fourth time. The company took part as a co-exhibitor in the past, but this time around it participated on its own. According to Mr Lua, the Chinese domestic market was not



LEFT: Trimax Trent 48-36 jaw crusher and Trimax ADplus 2612 vibrating screen on display at bauma China.

BELOW: The 48-36 jaw crusher is equipped with hydraulic wedge closed side setting (CSS) adjustment as standard, thus improving productivity and reducing downtime for the quarry.

the main reason for Trimax to return to the event. "We knew that a large number of international visitors would also attend and this has benefited us greatly," he said. "Such a large-scale event has definitely generated a greater awareness of our brand and products. The level of publicity we have received has been wonderful and would not have been possible if we had not participated in this trade show."

Mr Lua highlighted that international visitors formed a significant percentage of the total number of people who stopped at Trimax booth. "More importantly, we received visitors from our targeted markets, including Australia, Vietnam, Philippines, Thailand, Pakistan, Indonesia, Malaysia, India and Fiji. Many of them expressed a genuine interest in our products and requested follow-up quotations and even visits to their quarry sites after the show. This was exactly what we had hoped for!" asserted Mr Lua. ■

Website: www.trimaxmachinery.com



LEFT: Sebastian Lua, managing director of Trimax Machinery (in the centre) together with the company's team members at bauma China.

COMANSA

The new Comansa CML280 and CML310, with a reach of 60 m, are designed to meet the increasing demand for 18- and 24-t luffing jib cranes in Asia and the Middle East, and they will also be offered in Africa and South America. The cranes feature a short counterjib radius of only 7.3 m, making them ideal for use in congested sites.

The CML280 has a maximum capacity of 18 t. The crane features a hoist speed of up to 168 m/min and wire rope capacity of up to 790 m.

The 18-t CML310 also has a hoist speed of up to 168 m/min and wire rope capacity of up to 790 m. The 24-t version of CML310 delivers a hoist speed of up to 131 m/min and wire rope capacity of up to 640 m.

In addition, Comansa has upgraded two of its popular flat-top cranes. The 18 t versions of both 21CM335 and 21CM550 models now have a maximum capacity of 20 t. With this improvement, the company completes the upgrade of all models from



the 2100-series, which consist of tower cranes with maximum capacities from 12 to 50 t. ■

Website: www.comansa.com

BOTH IMAGES: The new CML280 and CML310 luffing jib cranes were Comansa's main launches at the show.

COMANSA UPGRADES 21LC660 AND 21LC750 FLAT-TOP CRANES

In another development, Comansa has updated its 21LC660 and 21LC750 flat-top tower cranes, which are mainly designed for large industrial projects, energy, mining and PPVC (prefabricated prefinished volumetric construction) applications. The 24-, 36- and 48-t versions of both models are now available in maximum capacities of 25-, 37.5- and 50-t respectively. This improvement could be achieved thanks to the use of a compacted wire rope, of smaller diameter, and an optimised design of the now lighter trolley-hook set.

A highly modular counterjib design was applied to both models, which improves their counterjib radius when they are erected with reduced jib-lengths. Thus, when the 21LC750 is erected with a 50-m jib, the counterjib radius is 25 m instead of 31 m as in the previous design. For the jib length, Comansa offers an optional 90-m radius for special applications. This option is available not only for the 21LC660 and 21LC750 models, but also for the 21LC1050 crane.

Moreover, the 21LC660 and 21LC750 (except the 20-t version of the 21LC660) feature a new optional hoist mechanism (132 kW), resulting in speeds of up to 300 m/min. Comansa has also added the Effi-Plus system to the optional 110-kW hoist mechanisms, available for all versions of such models. This system, which was already implemented in the other motors of both models, increases the hoist speed by almost 15% with light loads. The two mechanisms greatly enhance the productivity of the crane, especially when working at large heights. The two motors can have a wire rope capacity of 720 m or 1,570 m, allowing the cranes to work with



The maximum capacities for both the 21LC660 and 21LC750 flat-top tower cranes have been increased.

heights under hook of up to 785 m.

To simplify and unify the range of tower sections, the 21LC750 is equipped with the D36B mast. It is the same as the one for the 21LC1050 flat-top and LCL700 luffing-jib crane, and is fully compatible with the D36 mast section, which was standard for the 21LC750 and will now be discontinued.

The upgraded 21LC660 and 21LC750 are fitted with the XL-size Cube cab. These cranes are available worldwide and have been involved with various projects in countries like Germany, South Korea, Canada, Angola, Singapore, Sweden, Qatar, Australia, Argentina, Hong Kong and Ivory Coast, to name a few. ■

LINTEC & LINNHOF HOLDINGS

One of the highlights at the Lintec & Linnhoff Holdings booth was the Lintec CSM4000HS20SE containerised asphalt plant. The unit is built in 100% ISO containers with an average capacity of 320 t/hr at 3% moisture content. It is available with environmental protection systems as an add-on feature, which not only treat the dust emissions but also the bitumen fumes and odour.

Designed with environment conservation in mind, the production of the CSM4000HS20SE is carried out with the lowest possible emission of dust compared to other asphalt plants in the market, according to Lintec & Linnhoff. The first dust treatment takes place in the cold feed hoppers area, where raw aggregates are being fed into the hoppers and transferred into the drying drum for the drying process. PVC strip curtains are fixed on the cold feed hoppers to minimise dust flying. Dust emissions from the cold feed hoppers and conveying belts are filtered inside the pollution control system, where only clean air is being released into the atmosphere.

Secondly, hot gas emission from the burner on the drying drum is being processed in the asphalt plant's baghouse filter. Here, the dust is being filtered before being dispensed into the air, whilst the remaining particles are used as reclaimed filler. Lastly, bitumen fumes and odours from the bitumen tanks and mixer discharge are being processed inside a pollution control unit to lower the emission of these gases. A plasma system is used to eliminate the odour. This reduces work-site health hazard and effectively control emissions.

Lintec containerised asphalt plants are utilising the latest Mipro M4 software. This Mipro M4 is the fourth-generation automation system developed specifically for asphalt mixing plants. The visualisation is powered by MigaLive graphic engine, which provides scalability of fluid animated display with up to 20 frames per second range, depending on the complexity of the plant's production. All data on production logs, event messages, protocols and consumptions are automatically stored and can be compiled and printed through the Mipro Manager.

Headquartered in Singapore, Lintec & Linnhoff Holdings Pte Ltd (formerly known as IPS-Lintec Group Pte Ltd) is an international holding company owning three renowned brands in the asphalt and concrete industries: Lintec, Linnhoff and Eurotec. The company aims to offer more innovative, productive, efficient and eco-friendlier products and is also committed to continuing the near century legacy started by Eduard Linnhoff in Germany in 1919, who was regarded as a pioneer in the road and building construction industries. ■

Website: www.lintec-linnhoff.com

RIGHT: Lintec & Linnhoff received visitors from all over Asia during bauma China.



ABOVE: Lintec CSM4000HS20SE containerised asphalt plant features environmental protection systems as an add-on feature.

LEFT: The Mipro M4 software, fitted on the CSM4000HS20SE, is an automated control system developed specifically for asphalt mixing plants.

BELOW: Lintec & Linnhoff displayed a miniature of Lintec CSM4000HS20SE at bauma China.



CHEMGROUT

US-based manufacturer ChemGrout participated for the second time at bauma China. "This time the show is better for us than it was two years ago. In addition to visitors from mainland China, we've also had more visitors coming from different parts of Asia, like Hong Kong, Myanmar, the Philippines, and many others," said Rob Galbavy, marketing manager of ChemGrout.

ChemGrout offers standard and custom-built grouting equipment for various materials and capacities, specially developed to be user-friendly and trouble-free. Among them is the ChemGrout CG-680 HP series, which is suitable for applications such as tunnelling, dam foundations, soil compaction and encasements.

The CG-680 HP series is a high-pressure, high-capacity, skid-mounted colloidal grout machine for mixing and pumping slurries of cement, fly ash, bentonite and lime flour. It is designed to provide a continuous mixing and pumping operation, with a 0.5 cu m homogenising colloidal mixer, 0.5 cu m agitated storage tank and 120 l/min grout pump.

The high-capacity, double-acting plunger grout pump is connected directly to the agitated storage tank to provide a continuous pumping operation. The colloidal mixer is equipped with a 2X3X12 high-shear centrifugal diffuser-type pump that disperses the cementitious material down to its finest particle size to achieve complete particle wetness.

The mixing tank is also equipped with a bridge breaker to break apart the material before entering the colloidal mixer. The agitated storage tank has a variable-speed, high-efficiency paddle mixer that maintains a thoroughly mixed grout while waiting to be pumped.

The ChemGrout CG-460/2X8 HP colloidal series is ideal for the grouting of hollow bars, tiebacks and ground anchors. The unit has two high-shear colloidal 265-l mixing tanks, and a double-acting, high-pressure 2X8 plunger grout pump. This pump is fitted with fasteners that can significantly reduce disassembly time for quick cleaning and maintenance.

The dual colloidal mixing tanks allow for independent mixing of flushing and structural grouts. Each mixer is equipped with variable-speed, high-efficiency, high-shear disks rotating at speeds of up to 3,000 rpm for rapid and thorough mixing. The tank outlet valves feature a large 4-in butterfly type that assures full material flow into pump suction. The 2X8 plunger grout pump delivers 57 l/min and 138 bar, and an optional 3X8 pump delivers 76 l/min and 69 bar.

The CG460 series is available in a wide range of power options, including air, hydraulic, electric/hydraulic (25 hp electric motor), and diesel/hydraulic (33 hp Kubota engine). Both electric and diesel models require a separate skid-mounted power pack.

In addition, the ChemGrout CG-550/030 Rugged HP series is capable of handling materials ranging from fluid slurries to heavily sanded grouts. The unit can be skid-mounted or trailer-mounted, featuring a 170-l mixing tank, 57-l or 113-l holding hopper and single-acting 3-in piston grout pump.

Each mixing tank is equipped with baffles, bag breakers, and a variable-speed, high-efficiency paddle mixer that provides rapid grout mixing. The tank outlet is a large slidegate that allows viscous grouting materials to flow quickly into the removable holding hopper.

A complete grouting system combines the CG-030 piston pump with the high-efficiency paddle mixer to provide a continuous output of material. Both mixer and pump are equipped with their own variable speed control.



ABOVE: The CG-680 HP series.

RIGHT: The CG-550/030 Rugged HP series.

BELOW: The CG-460/2X8 HP colloidal series.



Materials commonly used with the CG-030 include cement slurries, sanded cement mixes, bentonite mixes (with or without sand), most repair mortars, high-strength non-shrink grouts and self-levelling products.

The large capacity hopper is mounted above the suction housing, enabling a new batch to be mixed while the first is being pumped. This helps to provide a consistent 'non-stop' discharge of material, virtually eliminating the clogging of tremmie lines.

The skid-mounted model is offered in a variety of power options, and is also available in a gas/hydraulic or diesel/hydraulic trailer version. The trailer-mounted model is a fully integrated system combining mixer, pump and power system. It is road and jobsite ready equipped with leaf springs, lights and a working platform. ■

Website: www.chemgrout.com

HOPPT

Singapore-based company UNi-Corp presented its light construction equipment under the Hoppt brand. One of them, the Hoppt CPT90C vibratory forward plate compactor is designed for the compaction of granular and mixed materials with some cohesive content in confined areas such as parking lots, highway and bridge construction projects, next to structures, curbs and abutments.

The CPT90C compactor delivers a centrifugal force of 14 kN, speed of 21 m/min, 0.89 mm amplitude, 95 Hz frequency and 91 db(A) sound pressure level. The straight, centre-mounted guide handle enables excellent manoeuvrability and can be lowered with centimetre of the surface to operate the plate under obstacles. There are many lifting points and a front lift cage for easy loading and unloading, making it convenient for the operator.

The Hoppt PCPT90P vibratory pavement compactor is equipped with a durable, heavy-duty rubber roll-bar system for compaction of floor tiles, pavement bricks in landscaping and in areas that need special prevention from breakages or damages. It features easy access to throttle control levers as well as protective covers with a smudge-free look to protect and prolong the lifespan of the belts. The PCPT90P offers an operating weight of 123 kg, vibration frequency of 94 Hz, centrifugal force of 10.3 kN and compaction area of 600-700 sq m/h.

The Hoppt TOL992GB walk-behind power trowel has an operating weight of 183 kg, blade operating speed of 50-150 rpm, and maximum blade pitch angle of 15°. It is fitted with heavy-duty gearboxes and rotating rings that allow the edger to glide smoothly along the wall. The gearboxes are precision engineered to transfer maximum torque to the trowel rotor, for a long trouble-free life. The cast iron GGG spiders, pressure plates and lift levers provides high durability. The bushings, trowel arms and spiders are precision-machined to close tolerance. The high-strength steel handle ensures maximum comfort and control.

The Hoppt RAM70C tamping rammer is suitable for compacting trenches, foundations, footings and retaining walls. It works well with cohesive or mixed soil material where the high clay content consists of small particles and low internal friction. The rammer provides an



ALL IMAGES: **UNi-Corp** introduced a wide range of Hoppt-brand light construction equipment.

operating weight of 79 kg, stroke of 50-80 mm, impact force of 16 kN, 650-700 blows per minute, compaction area of 260 sq m/h, compaction depth of 610 mm, and maximum working speed of 10-13 m/min. It is also equipped with a Triple Air-Filter System to prevent particulate matter (PM) from entering the engine's cylinder for cleaner fuel, thus prolonging the engine life. ■

Website: www.hoppt.com



DINGLI

Chinese manufacturer of aerial platforms Zhejiang Dingli showcased more than 40 machines, including six new boom lifts. These consist of four straight boom models (BT30RT, BT28RT, BT26RT and BT24RT), and two articulated boom models (BA28RT and BA24RT).

According to Dingli, the new boom lifts were produced using the company's 'smart technology' and offer many advantages. For one, their versatility of components and structural parts makes it convenient for automatic production arrangement at the manufacturing plant. The low error rate and high efficiency also make the machines suitable for mass production on the assembly lines.

The new boom lifts are equipped with Dana axle chassis, Bosch Rexroth high-pressure pump and motor, Deutz engine (Europe IV and V as options), Danfoss PVG hydraulic control system, Brevini slewing gearbox and bearing, Helac platform rotation system and other renowned global brands in order to improve their performance.

The load capacity of the new lifts is up to 450 kg, about 30% higher than similar models in the industry, said Dingli. The machines feature an overall component downshift design, added the company, moving the engine, fuel tank, counterweight and other components down. This reduces the centre of gravity of the



machines, increasing their stability. All components are located on both sides of the chassis for ease of maintenance.

The maximum working height for the straight booms is 30 m (with telescopic jib), and the articulated booms is 28 m, exceeding 2 m of the same model in the industry, said Dingli. The machines deliver a 50° gradeability and have a lightweight design. They also offer optional hydraulic generator and standard platform secondary guarding protection system.

Dingli revealed that as of 30 November 2018, the new boom lifts have received orders from approximately 200 global customers and all the exhibits were almost sold out. Xu Shugen, president of Zhejiang Dingli, said that the new boom lifts will be produced in a small scale. The company will speed up the construction of four-phase large-scale intelligent factories to provide guarantee for mass production of the boom lifts. Currently, the first boom lift model, the BT30RT, has been sent to a customer in the US. ■

Website: www.cndingli.com

ALL IMAGES: Zhejiang Dingli showcased more than 40 machines, including six new boom lifts.

MANITOWOC

Manitowoc officially launched its largest topless crane at the show, the Potain MCT 565. It offers jib length configurations from 30 m to 80 m in 5 m increments. At its 80 m jib end, the MCT 565 can handle an impressive 4 t.

With the increasing use of heavier construction materials, Manitowoc expects strong demand for higher capacity models. The MCT 565's load moment of 550 tm is a significant step up from the company's existing topless range.

"The MCT 565 offers the benefits of topless cranes on significantly larger projects. Asia Pacific, Africa, Latin America, the Middle East, Russia and other CIS countries have ambitious construction programmes and cranes like the Potain MCT 565 will help those regions meet their goals," said Francois Rotat, product manager for Potain tower cranes.

The upper section of the Potain MCT 565, with its full 80 m jib, travels on just nine trucks thanks to innovative, space-saving design features such as a folding cab on the slewing unit and a folding counter jib. At the jobsite, set up can be finished within two days and options like the detachable cab assist with this. Users have the option to split the slewing unit, counter jib and jib into different sizes depending on available space as well as capacity of the assist crane.

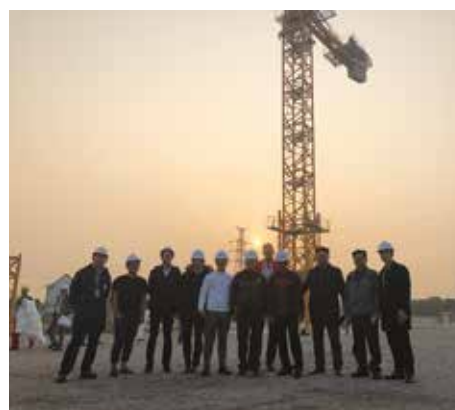
For the counter jib there are three options of 17 m, 21 m and 24 m, with users making their selection based on chosen jib length. This design feature not only aids transportation and erection, it also optimises the crane's overall footprint on tight jobsites. The slewing unit has a 'plug-and-play' design with much of the wiring completed at the factory. This makes installation faster and easier, delivering further cost and time-savings, while a host of other features facilitate installation. These include dedicated sling points on the counter jib and transport brackets on the jib to facilitate easier loading into the crane's compact transport configuration.

To deliver class-leading performance with this new crane, Potain has developed a new family of mast sections, the C800 and C850. These are offered on the new model as well as a range of its other cranes, and several configurations are possible on the MCT 565. There are C809A standard jib sections measuring 5 m - or users can opt for CR809A reinforced sections of 5 m or the shorter CR809C reinforced sections of 3.33 m. Depending on jib length, maximum freestanding height for the crane ranges from 70.9 m to 75.9 m. Climbing the crane up to 200 m is achieved with only three anchorage points. An additional option for the MCT 565 is the BC60R floor climbing system on 2-m mast sections. This compact option will appeal to contractors looking for an internal floor climbing crane for use on tall buildings.

Aside from working height, there is further flexibility in capacity with three versions of the MCT 565 on offer. Maximum capacities are 20 t, 25 t and 32 t. For the 20 t and 25 t versions there are two winches available, including one HPL unit from the High Performance Lifting range. These ultra-fast hoists have high rope availability, making them perfect for high-rise developments.

Customers can select either a 100 LVF from the regular line of Potain frequency-controlled hoists, or a 150 HPL from the High Performance Lifting range. The 150 HPL winch has a drum capacity of 1,200 m on the 20 t and 25 t models. For the 32 t version, the 150 HPL winch is offered. All winches are available with a safety brake option.

In combination, these features give the MCT 565 excellent lifting performance, beating all competitors across the load chart



TOP AND ABOVE:
The Potain MCT 565 is currently Manitowoc's largest topless crane.

LEFT: Some guests visited Manitowoc factory in Zhangjiagang where the MCT 565 was shown fully assembled, complete with its full 80 m jib.

in this capacity class, said Manitowoc. The company is expecting strong interest in the new model, not only in Asia but also the Middle East and Latin America. Deliveries of the Potain MCT 565 is expected to begin in early 2019.

For the official launch at bauma China, Manitowoc invited customers, dealers, end users and media to present the crane. The following day a group of special guests were welcomed to the Manitowoc factory in Zhangjiagang where the MCT 565 was shown fully assembled, complete with its full 80 m jib. ■

Website: www.manitowoc.com

RUBBLE MASTER

Austrian manufacturer of mobile compact crushers Rubble Master displayed its RM 100GO!, which is equipped with a new generation of mesh deck screens and hydraulic swivelling refeeding belts. The machine features a quiet operation and is suitable for a wide range of applications. Its fast and simple start-up enables quick and efficient on-site recycling.

With a capacity of up to 250 t/hr – depending on input material – the RM 100GO! can produce a high-quality end product. All mineral materials such as construction and demolition waste, concrete, asphalt, glass, coal, natural stone or steel-reinforced concrete with an edge length of maximum 750 mm can be processed to make high-quality building materials. The machine weighs only 29 t and has a high throughput on a par with that of larger crushers, said Rubble Master.

According to the company, the RM 100GO! and 120GO! crushers are quite popular in China. “In this market, our customers tend to go for large machines that can multitask,” said Sheng Shi, area sales manager of Rubble Master. “Also, there are many new projects in China on a regular basis, so our customers always think forward and prefer one big crusher that has the ability to perform various applications.”

“The weight to throughput ratio is extremely good with our machines,” said Shaun Montgomery, global sales manager of Rubble Master. “Our crushers are designed to be compact, lightweight and easy to transport. And when you put them to work, their capacities are very impressive and we’ve had positive feedback from our customers.”

“Rubble Master crushers are well known for their compactness,” added Mr Montgomery. “There have been some interests shown in our machines during the show.” Mr Montgomery further mentioned that Rubble Master has been growing globally over the past years and due to this, one of the company’s priorities is to extend its production facility in Austria to cope with the increasing demand.

With the growth of the recycling industry and tightening of environmental regulations, the demand for RM compact crushers is also on the increase in China, said Rubble Master. Among the company’s local customers is Mr Wu in Bengbu, who has owned an RM 120GO! with a mesh screen since the beginning of September 2018. He has been involved with numerous projects in the province of Anhui, processing concrete to form high value final aggregate. A main criteria for purchasing the RM crusher was said to be its compliance with the strict environmental regulations in terms of emissions, dust suppression and noise, thanks to the machine’s drive technology and dust suppression system. In order to enhance the quality of the final aggregate, Mr Wu added an RM wind sifter to the crusher.

The wind sifter was specifically developed to separate non-mineral matter from the mineral feed material. This enables a higher quality final aggregate to be produced and opens up new applications in the recycling sector. Such a solution offers customers a more environment-friendly and efficient system. The fan on the wind sifter can be regulated to ensure that lightweight materials (like styrofoam, textiles, wood, etc) are separated from the feed material. As a result, the final product is cleaner and offers a better quality so that a higher market price can be obtained for the recycled material. ■

Website: www.rubblemaster.com



Rubble Master joined bauma China 2018 together with its Chinese sales subsidiary, Tianjin Rubble Master Technology Co Ltd. The company displayed its RM 100GO! mobile compact crusher, one of the popular models in the market.



Shaun Montgomery (left), global sales manager of Rubble Master and Sheng Shi, area sales manager of Rubble Master, with the RM 100GO! crusher.



The RM 120GO! crusher is also a popular model in China.

© Rubble Master

AMMANN

The Ammann ABP 320 HRT asphalt-mixing plant is an ideal fit for asphalt manufacturers that need to incorporate large proportions of recycled asphalt (RAP) without sacrificing production capacity and quality. The 2-in-1 HRT (High Recycling Technology) plant features both warm and cold recycling systems that can be used simultaneously.

The Ammann ABA UniBatch asphalt-mixing plant delivers excellent performance, low fuel consumption and long plant life. It is easily customisable with features such as fibre additions, foam bitumen, and hot and cold reclaimed asphalt. The plant is engineered for easy integration of future options and technologies.

The Ammann ABC SolidBatch asphalt-mixing plant offers an outstanding cost/performance ratio. The purchase price is kept low because the plant is highly standardised and the base model offers few 'extras', according to Ammann. Instead, customers select the standard ABC SolidBatch model and then choose from a variety of options. Those options ultimately lead to a highly customised plant – yet customers only pay for the features they feel necessary.

The RSS 120-M shredder, iron separator and screener is a mobile machine that prepares recycled asphalt for use in an asphalt plant. It is essentially a 3-in-1 machine with its ability to function as a shredder, iron separator and screener. The machine is suitable for recycling asphalt that ranges in size from millings to larger pieces. Protective processing also maintains desired grain sizes. The RSS 120-M can go from installation to production in as quickly as 30 minutes, said Ammann. The machine is track-mounted for maximum mobility on all types of terrain.

Amdurit, Ammann's mixing-plant wear-protection system, provides three times the service life of wear-resistant steel and protects valuable parts and components. The components last longer, which translates to fewer replacements and reduced labour and therefore lower costs. Overall plant uptime is improved as well. There are many potential areas of use, including drum inserts; transition and discharge locations; feeders (both RAP and traditional); and silos.

Ammann retrofits are prioritised because they enable older plants to access



ABOVE LEFT: The HRT asphalt-mixing plant.

ABOVE: The ATR 68 P rammer.

LEFT: The RSS 120-M shredder, iron separator and screener.

BELOW: The APF vibratory plate compactor.

the latest technological and environmental improvements. Ammann said the company has a tested retrofit process that costs a small fraction of the price of a new plant and is available for asphalt-mixing products made by Ammann and other manufacturers. Key benefits include environmental upgrades, technological improvements and an overall rejuvenated plant.

In addition, the Ammann APF 15/50 forward-moving vibratory plate compactor combines the Ammann exciter system with low hand-arm vibration (HAV) levels, making it comfortable and safe for operators. The plate features a working width of 500 mm and engine power of 2.9 kW. The plate's technologically advanced exciter unit is maintenance free, with cylindrical bearings that reduce wear. The exciter system also provides significant forward-moving power to enhance productivity in challenging materials and on steep grades.

The Ammann ATR 68 P rammer delivers excellent compaction output and forward movement. The machine is a premium



rammer and meets the strictest restrictions for emissions and operation vibration levels. Key features include a Honda GXR120 engine; an optimised gas lever, shaped and positioned for easy reach and operation; a handle concept that limits hand-arm vibration to protect the operator and meets the strictest safety regulations; and an additional air filter, which extends the life of the machine. ■

Website: www.ammann-group.com

SKYJACK

Skyjack exhibited a fleet of articulating booms, DC electric scissor lifts and a vertical mast. Year over year, each of these product categories have seen a strong three year average growth in the Asian market, said the company. It also presented the first in the next generation of its DC scissors for a sneak peek at the redesigned ANSI machines.

The prototype SJ4740 DC scissor lift has been built to meet the updated ANSI standards, which were introduced in December 2018. "One of the major changes for Skyjack is the addition of load sensing system to our machines, especially scissor lifts. This system aims to make sure the rated load of the machine and platform is not exceeded, enhancing safety," explained Malcolm Early, vice president of marketing at Skyjack. "Another thing is that because wind tests are more stringent, we have introduced stronger cross bars on the scissor stack to help make it a lot more rigid and give a better view for the operator."

Apart from meeting the new ANSI standards, Skyjack has also upgraded the SJ4740 DC to respond to the customers' needs, added Mr Early. These include the redesigned pothole protection system – it is now less prone to clogging and damages; simplified emergency lowering system; and more robust and lightweight control box – which is made of a composite material.

The Skyjack models on display included: SJ16 vertical mast lift - with a working height of 6.58 m, stowed height of 1.79 m and an overall capacity of 227 kg; SJIII 3219, 4632 and 4740 DC electric scissor lifts - with working heights ranging from 7.62 m to 13.8 m, overall capacities ranging from 249 kg to 318 kg, all complete with roll-out extension decks ranging from 0.91 m to 1.22 m and solid non-marking tyres; and SJ30, SJ63 and SJ85 AJ articulating booms – with working heights ranging from 10.90 m to 27.24 m, overall capacities ranging from 227 kg to the SJ85 AJ's dual platform capacity of 227/340 kg.

"We've been busier at the show this year (2018) compared with the last edition, with visitors coming from all over the world including Australia, Vietnam, Korea and the US," said Mr Early. "Generally speaking, Asia has been growing very well for us and in fact, last year was our record year in the market." ■

Website: www.skyjack.com



ABOVE: Skyjack exhibited a fleet of articulating booms, DC electric scissor lifts and a vertical mast.

LEFT: Malcolm Early, Skyjack's vice president of marketing, and the prototype SJ4740 DC scissor lift.

SKYJACK'S SECONDARY GUARDING FOR SCISSOR AND MAST LIFTS

Skyjack has also recently released its Secondary Guarding Lift Enable (SGLE) as an option for use on vertical mast, DC scissor and rough terrain scissor lifts. The system is designed to reduce the risk of entrapment caused by inadvertent machine operation.

With the SGLE, both joystick and tamper-proof secondary enables must be activated to allow the platform to lift – the release of either will stop the functions immediately. The ergonomics are such that the operator's body is kept in an upright position and away from the railings; mitigating the risk of entrapment. The secondary enable button is not used for lowering the platform or for driving; those functions remain joystick-enable only.

The SGLE is suitable for all Skyjack scissor lift and vertical mast lift models, and is available as an optional direct factory install or aftermarket accessory. ■



Skyjack offers its Secondary Guarding Lift Enable (SGLE) as an option for use on vertical mast, DC scissor and rough terrain scissor lifts. It aims to reduce the risk of entrapment caused by inadvertent machine operation.

WIRTGEN

The Wirtgen W 195 cold milling machine features a 2-m front loader for efficient milling operations. Equipped with a 410 kW diesel engine, this model delivers enormous engine power while still consuming less fuel per cubic meter of milled asphalt. It is suitable for all milling operations typical of the 2-m-class.

The Level Pro Plus, the levelling system developed by Wirtgen, has been integrated into the machine's control system. It ensures a precise, high-quality milled result thanks to its simple intuitive handling. The preset target milling depth is accurately controlled via robust displacement sensors located in the hydraulic cylinders - which are mounted on the side plates - and is shown on the high-resolution Level Pro Plus colour display. The Level Pro Plus enables a wide range of sensors to be used as standard equipment. Mechanical surface scanning, cross slope sensor, ultrasonic sensors or the Multiplex system guarantee excellent precision levelling for various milling applications.

The W 195 can achieve high daily production rates thanks to its simple and reliable operating concept. For example, the robust, easy-to-handle controls are arranged in a clear pattern and in line with application requirements. The weatherproof control screen provides clear information on all relevant data and operational parameters.

Another model, the W 205, features excellent milling performance and professional supplementary equipment. The machine is equipped with a 455 kW diesel engine and caters to a variety of applications, from surface course rehabilitation all the way to full pavement removal.

The Flexible Cutter System Light (FCS Light) enables the use of different milling drums to increase flexibility and machine utilisation. With this system, milling drums with various tool spacings can be replaced in a short space of time, making it possible to perform a wide range of milling operations with one machine. As such, the W 205 is extremely versatile to use, covering everything from standard applications through fine milling for the creation of new, level road surfaces (ideally with the Multiplex levelling system) to the use of Eco cutters for a particularly high area performance at low cost.

Furthermore, the Delta 18 milling drum technology and three adjustable milling drum speeds allow for a superior performance at low operating costs. With Delta 18, the W 205 can achieve a greater milling output due to the optimised arrangement of the cutting tools in the outer ring and the conveying and ejecting areas of the milling drum, while simultaneously reducing the cutting tool wear. The three selectable milling drum speeds lead to an optimum milling performance across a wide range of applications, with milling widths of 2,000 mm and milling depths up to 330 mm. High traction of Wirtgen's large milling machine is obtained by the exceptionally robust track units fitted with large track pads.

The W 215 is the top performer among the cold milling machines, offering maximum milling performance and high productivity in a broad scope of applications. With this model, customers can call on an extra 25% of milling output, according to Wirtgen. Equipped with a 470 kW diesel engine, the Wirtgen front loader delivers enormous engine power yet still consumes 15% less fuel per cubic meter of milled asphalt.

The W 215 also has a comprehensive range of equipment including the VCS vacuum cutting system for good visibility and



FROM TOP: Wirtgen W 195, W 205 and W 215 cold milling machines.

optimum working conditions, camera system, LED lights, milling drum turning device and last but not least with a set of levelling equipment. ■

Website: www.wirtgen.com

XCMG

Chinese global manufacturer XCMG introduced its latest products and unveiled ambitious new initiatives, including the establishment of a high-end innovation centre for construction machinery and core components, as well as a strategic alliance to promote technological development.

“The alliance, which aims to promote collaboration in R&D and solve technical problems that occur during the construction machinery and core parts development process, is an answer to China’s call for the creation of world-class manufacturing industry clusters,” said Wang Min, chairman and president of XCMG. “It also serves as a renewed promise by XCMG to the construction machinery industry that it will remain at the forefront of promoting innovation and technological development.”

The company said that it will focus on the product strategy of ‘high-end, high added value, high reliability and large tonnage’ upon the launch of the alliance.

During the event, XCMG also celebrated the first delivery of its GTBZ58S boom lifts to Sinopec Heavy Lifting & Transportation Co Ltd (SHLTC). With a maximum working height of 58.6 m and maximum gradeability of 45%, the GTBZ58S is reportedly the tallest aerial platform in the world.

The new boom lift has a maximum capacity of 450 kg, maximum working range of 25.1 m and is powered by a 74.4-kW engine. The machine can reach its maximum height from the ground in merely 5 minutes, according to XCMG. It is also fitted with customised proportional valve that improves its lifting speed.

The GTBZ58S is among the 14 new aerial platforms that XCMG showcased at bauma China and represents the company’s new strength in the aerial platform sector.

Some other activities by XCMG included: a delivery ceremony for its largest all-terrain crane, the XCA1600 – which is also said to be the largest in the world; new product releases, such as a multi-functional, highly-mobile emergency rescue vehicle and smart system for mining; updates on ‘Customise for You,’ the company’s new programme to provide customised solutions for its customers based on their specific needs; and updates on the company’s ‘For A Better Life’ public welfare campaigns and information on the launch of Phase 3 of its water cellar project in drought-stricken countries in Africa, in partnership with the China Foundation for Poverty Alleviation (CFPA).

XCMG also presented more smart and efficient solutions, like its unmanned mining truck, smart levelling system for hydraulic cylinders, all-terrain crane and integrated mining solutions.

In addition, XCMG reached milestone deals with leading international companies, including a US\$100 million cooperation agreement with Russia’s KBA Mining Company (KBA).

“With the support of global dealers, suppliers and partners, as well as the hardworking XCMG staff, the company



TOP AND ABOVE: A comprehensive range of machines from XCMG.

RIGHT: XCMG GTBZ58S boom lift is said to be the world’s tallest aerial platform.

is progressing fast in the international market towards the goal of achieving 50% of its revenue from overseas sales,” said Mr Wang. XCMG revealed that it has experienced explosive growth in the global market with more than US\$1.3 billion in total export value, which marks a 40% year-on-year increase. The company’s products are now present in 182 countries and regions. ■

Website: www.xcmg.com



LIEBHERR

The Liebherr R 920 crawler excavator is available in less regulated markets such as Southeast Asia, India, China, Russia and South Africa. This 21-t machine is designed for use in earthmoving, digging and drainage/sewerage work, and is powered by a 110 kW Cummins diesel engine that meets the Stage IIIA / Tier 3 / China III emissions standards. The six-cylinder common rail system is also compatible with diesel with high sulphur content or with biodiesel B20, resulting in greater performance and reliability over the long term.

The R 920 has a 7-in touchscreen display and large windows to provide the operator with an excellent view of the working environment. The Positive Control hydraulic system makes the combined movements of the machine even more fluid, which in turn increases the breakout forces and breakaway torques. Other highlights of the R 920 include robust travel mechanism, Liebherr Z tooth system for attachments, and the optional backhoe bucket in a heavy-duty version - all of which ensure a long and efficient use of the machine.

Liebherr's new A 920 Litronic wheeled excavator is also targeted at less regulated markets. Powered by a 129-kW Stage IIIA / Tier III / China III engine, the machine has an operating weight of 20,300 kg and is ideal for construction sites with a high travel requirement, such as road construction, trenching and pipeline construction, as well as general earthmoving work.

The A 920 Litronic can move on its own axis to the next construction site, thus saving transport costs. Thanks to its rubber tyres, the ground is protected and the machine can be moved to the next operation site with low noise. If the Likufix hydraulic coupling system is added, a quick and safe changeover of hydraulic attachments can be done from the cab at the touch of a button. This not only extends the versatility of the machine and increases its productivity, but also results in safety on the construction site because there is no one in the danger zone during the tool change.

In addition, Liebherr's 300-t LTM 1300-6.2 mobile crane features a 78 m telescopic boom. The machine is powered by an eight-cylinder Liebherr diesel engine, which develops 450 kW at 1,900 rpm and torque of 2,856 Nm at 1,500 rpm.

Thanks to its high load capacity with telescopic boom extended, the LTM 1300-6.2 is suitable for erecting tower cranes. Apart from its 78 m telescopic boom, a whole range of lattice jib systems is available that can equip the crane for a wide range of applications. The LTM 1300-6.2 also features the Liebherr Licon2 crane controller, which has now become established in a number of Liebherr mobile cranes.

The 12.5 m - 21 m double folding jib can be extended by two additional 7-m sections to a total of 35 m. This 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° whilst 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.

According to Liebherr, the company has designed the new six-axle LTM 1300-6.2 as a classic folding jib crane, so that it can be used with the same speed and flexibility as a five-axle model. The crane's luffing lattice jib can be erected in steps of 3.5 m up to a height of 70 m. The 14 m - 42 m fixed jib also has modules of 3.5 m, helping to improve its load capacity.

The LTM 1300-6.2 is fitted with pneumatic disc brakes, which



FROM TOP: Liebherr R 920 crawler excavator, A 920 Litronic wheeled excavator and LTM 1300-6.2 mobile crane.

not only provide better braking performance compared with drum brakes, but also are more economical since the brake pads can be replaced more quickly and easily, said Liebherr. The four rear axles on the six-axle chassis of the new crane have active electro-hydraulic steering depending on the machine speed. This increases the manoeuvrability of the machine and drastically reduces tyre wear. ■

Website: www.liebherr.com

JLG

JLG debuted its latest products in Asia, including the X33JP compact crawler boom lift, the newly designed R-series 2632R/3246R scissor lift and the new light weight electric scissor lift. The company also presented its mobile control app and Enhanced Detection System (EDS).

The JLG X33JP compact crawler boom lift features a new design. Innovative two articulating booms, combined with a 1.3 m jib for +/-90° movability, both up and down, ensures a better lift and over, allowing it to adapt to a variety of complex conditions. Working platform rotation +/-90° has also increased working flexibility.

The X33JP offers a platform capacity of 230 kg. The machine possesses many smart functionalities, such as the single button for TB rising, multiple simultaneous movements, delivering high efficiency and safety. It is also equipped with a dual-mode diesel/AC electric powertrain, and a lithium battery power supply as optional, which effectively reduces emissions and noise pollution during equipment operation for better environmental protection.

The new 2632R/3246R are the latest additions to JLG R-series scissor lifts. The 2632R has a platform capacity of 230 kg and working height of 9.8 m, while the 3246R features a platform capacity of 320 kg and working height of 11.75 m.

The platforms are made entirely of all steel components while a swing-out tray for battery and hydraulic system adds greater serviceability. Meanwhile, the platforms are equipped with reliable and durable active pothole protection, thicker non-marking tyres and multi-function battery charger, making the 2632R/3246R an excellent choice for both indoor and outdoor applications. JLG said it has improved the whole R-series scissor lift product line, with operating heights ranging from 6.5 to 14 m, to meet the different needs of construction.

The company has also launched a new series of machines - the light weight electric scissor lifts featuring a small size and light weight design. They include a 1330/1530 Concept, 1530 Concept Crawler with operating heights ranging from 5.8 to 6.5 m and 227 kg platform capacity. Dual front-wheel drive electric engines provide better endurance. The front wheel steering system enables a zero turning radius, not only ensuring that the platforms meet the requirements of narrow space



JLG X33JP Plus compact crawler boom lift (above), and the 2646R and 3246R scissor lifts.



JLG 1330 Concept (above) and 1530 Concept scissor lifts.



in constructions and improving platform manoeuvrability, but also enabling the equipment to fit in freight elevators. The design concept of this series is similar to that of the R-series scissor lifts, which is easy to maintain resulting in a lower total cost of ownership. Moreover, the series is ANSI compliant, improving its resale value in Asian markets.

In addition, JLG Enhanced Detection System (EDS) uses strategically placed object detection sensors to detect obstacles in the surrounding environment. The sensors collect data and transmit it to control unit. It prevents the occurrence of

safety accidents in construction, thanks to EDS alerting the operator or stopping a machine when it makes contact with an object or structure. At present, the system is available for the JLG 1930ES scissor lift.

JLG mobile control app allows operators to remotely control the equipment by scanning the QR code on the platform to build the connection with Bluetooth. Operators can then use the app to make the platform move like forward or backward, steer left or right, up and over etc. According to JLG, the app is available for all of its R-series scissor lifts. ■

Website: www.jlg.com

CATERPILLAR

Caterpillar exhibited more than 30 machines, including its Next Generation hydraulic excavators, off-highway trucks, wheel loaders, motor graders, mini excavators and paving products, under the Cat and SEM brand.

The general construction machines comprised 11 Cat hydraulic excavator models, including the 390F L with a maximum operating weight of 96,275 kg; Cat Next Generation large excavator models that feature significant technology advances, such as working efficiency increase up to 45% equipped with technology; Cat Next Generation 320 and 323 excavators, which use an estimated 20% less fuel than predecessor models in certain applications; and Cat 772 off-highway truck, with a rated capacity of 31.3 cu m and a gross power rating of 446 kW. The truck was paired with the Cat 986K wheel loader, which has bucket capacities ranging from 5 to 10 cu m.

Cat building construction machines included six Next Generation mini excavators - 301.5, 301.7 CR, 302 CR, 307.5, 308.5 and 310 - designed for productive performance and optimum operator comfort, while reducing fuel consumption and overall operating costs. Cat paving products consisted of the PM620, a high-production, highly manoeuvrable, half-lane milling machine that can perform controlled, full-depth removal of asphalt and concrete pavements in a single pass; and the CS79B soil compactor, which provides a pod-style vibratory system that is virtually maintenance free, with the first scheduled maintenance period at three years or 3,000 hours.

Shandong Engineering Machinery Co Ltd manufactured SEM-branded wheel loaders in China for more than 50 years and became a Caterpillar subsidiary - Caterpillar (Qingzhou) Ltd - in 2008. Several SEM machines at bauma China included the new SEM680D wheel loader, which offers transmission with electronic clutch proportional control valve with single clutch speed shift strategy to provide higher shift quality; the upgraded 162-kW SEM822D dozer, fitted with electronically controlled hydrostatic drive; and the new SEM918 motor grader with a loading sensing hydraulic system that features easy operation and lower fuel consumption. In addition, the SEM522 soil compactor features a pod-style eccentric design, which can extend system life by 50% and reduce the maintenance cost as well.



Caterpillar presented more than 30 machines, including excavators, dump trucks, wheel loaders, motor graders, mini excavators and paving products.



Cat PM620 milling machine.



Cat Next Generation 323 excavator (above) and mini excavators (below).



Caterpillar also launched a new smart device that would be the first-ever smart wearable device in the construction machinery industry, which can connect directly with an excavator. As a smart device, the Cat Watch connects the equipment, jobsite and daily life. ■

Website: www.cat.com

HAULOTTE

Haulotte introduced its Pulseo generation, with the HA20 LE and HA20 LE Pro being the first models in this product line, offering lower energy costs as well as reduced air and noise pollution. These new electric, rough-terrain mobile elevating platforms are suitable for use in public places such as shopping centres, airports, concert halls and pedestrian streets, and also in areas where low-emission and low-noise are required like hospitals and schools.

The machines' oscillating axle and four-wheel drive deliver excellent performance and stability for outdoor applications. Solid cured-on tyres provide the wheels with the flexibility needed to properly hold the ground, even on the roughest terrain. With their non-marking tyres, the machines can also work indoor.

Thanks to its silent electric operation, the Pulseo generation can be used at any time with less inconvenience to its surroundings. Its low tail swing and easy handling allow for operation in confined spaces. Its fast elevation speed, 360° continuous turret rotation and simultaneous movements work together to enhance productivity. Dual-load models make it possible to increase the load capacity while adapting to the working envelope, leading to stability.

The Pulseo series offers proportional controls that ensure precise movements, resulting in smooth operation on the way up to the work area. The Haulotte Activ'Shield Bar 2.0 secondary guarding device system is also available in order to prevent the risk of entrapment. Protected by the Safety Gap, the operator maintains easy access to controls and unobstructed visibility.

The Haulotte Activ'Lighting System ensures safe performance of the delicate procedures to load and unload the equipment. Comprising 11 LED spotlights, it provides ideal illumination of the basket, controls and the manoeuvring area around the machine.

Furthermore, high-capacity batteries and the ability to lower the basket by force of gravity with no power consumption maximise the battery performance for a full day's work. If extended battery power is required, the on-board range extender engine can rapidly recharge the batteries, while the machine



ALL IMAGES:
The Pulseo generation - Haulotte's new electric, rough-terrain mobile elevating platforms.

retains its full operating capacity during the charge cycle. At the end of a shift, the built-in charger and its smart power management module optimise both the charge and lifespan of the batteries.

The Haulotte Activ'Energy Management system, developed in partnership with Liten - a major European research institute and a driving force behind the development of sustainable energy technologies of the future - is designed to extend the lifespan of the batteries.

The Pulseo generation also features maintenance-free electric motors, extended maintenance intervals, easy access to components and simple battery maintenance. The Haulotte Activ'Screen system makes life easier for users and technicians on a daily basis. It can be used to configure the machine, provides users with information to help them identify alarms, allows them access the list of preventative maintenance procedures, and also helps to diagnose and resolve malfunctions if necessary. All Haulotte Activ'Screen functions are available on mobile devices via the Haulotte Diag app. ■

Website: www.pulseo-generation.com



VOLVO

The new R100E rigid hauler from Volvo Construction Equipment offers a 95-t payload and is powered by a 783 kW engine. Drivetrain control and machine moment are supplied by the new Volvo Dynamic Shift Control, which automatically tailors the transmission shift-points depending on the worksite and operational inputs.

The R100E is built for all surface mining and quarrying applications, where operational costs are critical. The machine features a 60.4-cu-m-capacity V-shaped body for optimum load retention and minimal material carry-back. The load profile policy enables the operator to meet a consistent average target payload (95 t), while the speedy body-tipping system ensures fast cycle times for an all-round efficient performance.

With a body manufactured from high impact and high abrasion-resistant 400-HBW-hard steel, the R100E rigid hauler achieves long-lasting performance. The front suspension is widely spaced to absorb load and ground surface shocks, and protect vital machine structures. Detailed engineering is also evident in the machine frame 'horse collar' design, providing flexibility to travel on uneven terrain. The On-Board Weighing (OBW) option is an integrated system that ensures the machine moves the optimum safe payload to further optimise production and minimise operational costs.

The R100E offers a low centre of gravity and is equipped with an expertly designed body and chassis that work in harmony with the McPherson strut with lower wishbone front suspension and the new low-effort steering system. The operator can easily manoeuvre around tight corners with light, intuitive steering provided by the pilot-operated remote-mounted orbitrol control valve.

The machine's ROPS/FOPS-certified operator cab features reduced vibrations and exterior noise. It is fitted onto viscous-type isolation mounts for greater ride quality. Good visibility is complemented by a 360° surround view system provided by Volvo Smart View. The system uses multiple ultra-wide-angle exterior-mounted cameras to produce a bird's-eye-view of the vehicle and surrounding work area via the on-board display.

For the protection of both the operator and site staff, all machine systems - such as the emergency shutdown switches - are easily accessible. The transmission retarder and neutral coast inhibitor secure safe machine control in downhill conditions, while the engine overspeed protection automatically slows the machine down to safe operating limits.

The service points on the R100E are strategically grouped and located within reach from the ground and service platform to provide quick, easy and safe machine maintenance or adjustments, while the direct rim-mounted wheel design promotes safe and quick installation and removal.

In addition, the new Volvo EC75D is specifically designed for the Chinese market, and is the largest compact excavator in the 7.4-7.8 t weight class. The machine's undercarriage ensures excellent stability and lifting capacity, together with high ground clearance and an extensive working range. Thanks to its larger size, the EC75D can be used with a bigger bucket than similar machines in the same class, said Volvo, thus helping to increase productivity.

The boom and arm are made from high strength tensile steel for maximum durability and uptime, and are fixed to the superstructure at the side of the cab for improved stability and visibility of the work area. The superior tractive force of the machine allows it to climb steep gradients with ease and travel over rough terrain. If specified with an optional dozer blade, backfilling



ABOVE AND LEFT: Volvo R100E rigid hauler is available for Asia Pacific customers.

BELOW: Volvo EC75D excavator is designed specifically for the Chinese market.



and landscaping are also made easy. Meanwhile, the balance between the torque and swing speed permits fast and precise placement of the attachment, even when working on a slope.

The EC75D cab also encourages the operator to work productively, thanks to its spacious and comfortable environment with easy-to-access controls, an efficient climate control system and vibration-and-noise isolation. For easy maintenance, the machine features grouped service points and simple access to the engine compartment via the engine hood, which can be opened fully. The large capacity diesel tank is also easy to fill from the ground level, using an electric pump with an automatic stop function. The tank can be filled within four minutes at a delivery rate of 35 l/min. ■

Website: www.volvoce.com

BAUER

One of Bauer's latest innovations at the show was the GB 80 S hydraulic grab system, which is a combination of GB series carriers and DHG V grabs. It covers all possible applications of the DHG V grab and thus the entire spectrum of tasks that can be performed by a hydraulic grab.

Using the GB 80 S, trench with widths of up to 1,800 mm can be excavated to 80 m depth. The hydraulic system and two single-layer winches have been optimised in order to reduce fuel consumption and wear. Thanks to the service platform integrated in the new BT 80 base carrier, service and maintenance can now be carried out more easily and safely.

"The new generation GB 80 S has been developed to master the increasingly complex working conditions on diaphragm wall construction sites. It is a completely new machine in a new performance class," said Dieter Stetter, chairman of the management board of Bauer Maschinen GmbH.

Another innovation presented by Bauer was its BCS 40 cutter system. Manufactured in China, this new machine is designed for cutting depths of up to 40 m - and thanks to its compact design, it can be used in inner-city areas. This cutter system combines three of Bauer's long-established systems for the first time: the BC 32 trench cutter, the HSS 40 hose guide system and the MT 120 carrier. Low fuel consumption and ease of use make it a highly effective equipment. According to Bauer, the first cutter systems of this type have already been successfully tested and used in China since early 2018.

Bauer also exhibited two rotary drilling rigs - a BG 30 with BV casing oscillator and a BG 55 with a double-head system. Both machines meet the increasing demand for cased bored piles and secant pile walls in the Chinese market. The BG 55 achieves much higher performance compared to the Kelly drilling method for comparable drilling tasks and geological factors, said Bauer. A notable feature of the BG 30 is the longer crowd cylinder with more retraction force. This allows for the handling of longer casing segments for cased Kelly piles. A stronger UW 100 undercarriage makes the use of a BV oscillator possible. The Bauer BG 30 thus offers excellent performance for the construction of secant bored pile walls.

In addition, two BFS-T drilling simulators were set up for visitors to test their skills with rotary drilling rigs. The Bauer



ABOVE: Bauer's new GB 80 S hydraulic grab and BCS 40 cutter systems can be seen here in the middle (next to the BG 55) and on the far right, respectively.

LEFT: Bauer BG 30 rotary drilling rig.

BELOW LEFT: Visitors were able to test their skills with rotary drilling rigs at the Bauer BFS-T drilling simulator booth.

BELOW: Bauer team at bauma China.



Foundation Simulator was developed to simulate Kelly drilling on a Bauer rotary drilling rig. With its life-like depiction, the simulator is ideal as an initial training tool



for equipment operators. As a portable version, the BFS-T model is suitable for use in various work places. ■

Website: www.bauer.de

BOMAG

The Bomag BM 2000/60-2 milling machine has a 2 m milling width, 30.3 t operating weight and can mill as deep as 32 cm. It is powered by an eight-cylinder 440 kW Deutz water-cooled engine. Together with pressurised milling chamber side plates, the machine provides a precise milled surface and accurate milling depth control. The milling depth control and the cross slope is carried out by the 'Intelplanner' system.

The Bomag Advanced Comfort System (ACS) features a completely vibration-isolated operator's platform. The whole platform is independently mounted on a vibration cushion, which eliminates hazardous vibrations during operation. A large capacity 1,200-l water tank is also available as standard, allowing for a long continuous operation without the need for refilling.

Another highlight from Bomag was the BF 800C asphalt paver, which is designed for working on highways where a maximum 10 m paving width and powerful tractor unit is required. The machine is powered by a 135 kW Deutz water-cooled engine. The 3,360-mm-long tractor wheelbase has extra space for the tractor pads to deliver ample traction force and stability during loading of material in the hopper. This long tractor wheelbase can also better level out ground unevenness to ensure the smoothness of the mat surface.

On the BF 800 C, there are two types of screeds with hydraulic extensions. The basic widths are 2.5 m and 3 m. The Bomag hydraulic extended screed reportedly offers the heaviest weight in its class, together with vibration and tamper; this helps to achieve high pre-compaction. The base plate of the screed is 400 mm wide,



ABOVE AND BELOW: The BF 800C asphalt paver.



ABOVE AND BELOW: The BM 2000/60-2 milling machine.



which guarantees a smooth surface finish. The screed is electrically heated by a single-section long service-life heating element, in order to attain quick and homogeneous heating.

To enhance the operator's view of the jobsite, the whole platform can be moved sideways by 40 cm to either left or right side of the machine - with the Bomag Side View System. The operator seat also offers 15 positions for adjustment to obtain the best operating view. Each function is controlled by toggle switches, no computer panels or light touch film switches. The toggle switches can be replaced at a very low cost and are easy to find in case of unexpected breakdown, said Bomag.

Furthermore, Bomag has introduced the second generation of its Asphalt Manager system on heavy tandem rollers. The Asphalt Manager 2 gives greater flexibility in terms of applications on roads, bridges and other jobsites that are sensitive to vibration.

The new system features more setting flexibilities, such as the introduction of Prof. mode in addition to fully automatic mode and manual mode as in the previous generation. With the Prof. mode, contractors can set Evib according to the materials the machine compacts and also asphalt surface temperature.

For less experienced users of Bomag Asphalt Manager system, in the fully automatic mode, the system provides more compaction energy selection from easy to tough asphalt mix. With special applications like bridge compaction and similar vibration sensitive jobsites, the operators can choose bridge compaction mode. ■

Website: www.bomag.com



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KEESTRACK

Among Keestrack machines on display was the B4 jaw crusher, which ensures less wear and better crushing capacities due to its double-deck vibrating pre-screen (2,300 x 1,000 mm). The plant has a maximum feed size of 600 mm, reaches an hourly output of up to 400 t and provides a hydraulic automatic gap adjustment to safely prevent clogging and automatically adjust the jaw plates to compensate wear.

For optimised maintenance, the B4 has a hydraulic sliding frame for service access under the feeder and scalping unit. Optionally, the plant can be equipped with a single-deck post screening unit. This track-mounted jaw crusher is also available as hybrid plug-in B4e version with drop off power-supply module. The hybrid version of the 50-t model B4 enables plug-in operations from the mains and is an economical alternative for semi-stationary deployment at recycling companies, large construction sites or quarries.

Keestrack's fully hybrid H4e cone crusher offers an optional three-deck hanging screen. The plant weighs only 46 t (without options is 35 t), offering easy road transport and fast relocation on site. For flexible autonomous operation, the plant is equipped with an on-board diesel engine. The engine drives an alternator, providing power to the electric motor of the crusher drive and to the separate e-motor/pump unit for all hydraulic drives on the plant (tracks/fans/screens/hydraulic cylinders). Without starting the diesel, this setup enables the plant to operate fully 'plug-in' from mains or external gen set, resulting in energy cost savings up to 70% compared to conventional diesel-hydraulic plants, according to Keestrack. The H4e has a detachable drop-off unit and can be placed remotely during operation, thus reducing dust



Keestrack B4 jaw crusher as primary crusher feeds an H4e cone crusher producing four highly defined quality end products.

and vibration on the drive unit and facilitating easy maintenance.

The fully automated H4e produces up to 250 tph at maximum feed sizes of 185 mm. The wide variety of concaves allows a high flexibility in secondary or tertiary production of highly defined end fractions. To optimise production, the plant can be optionally equipped with a pre-screen with fines chute and with a highly efficient three-deck secondary screen module with recycling conveyor for closed-circuit processing. The large measurements of the hanging screen (effective area: 3 x 5.4 sq m) and large stockpiling capacities of the conveyors prevent bottlenecks in producing up to four highly defined quality end products. ■

Website: www.keestrack.com

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