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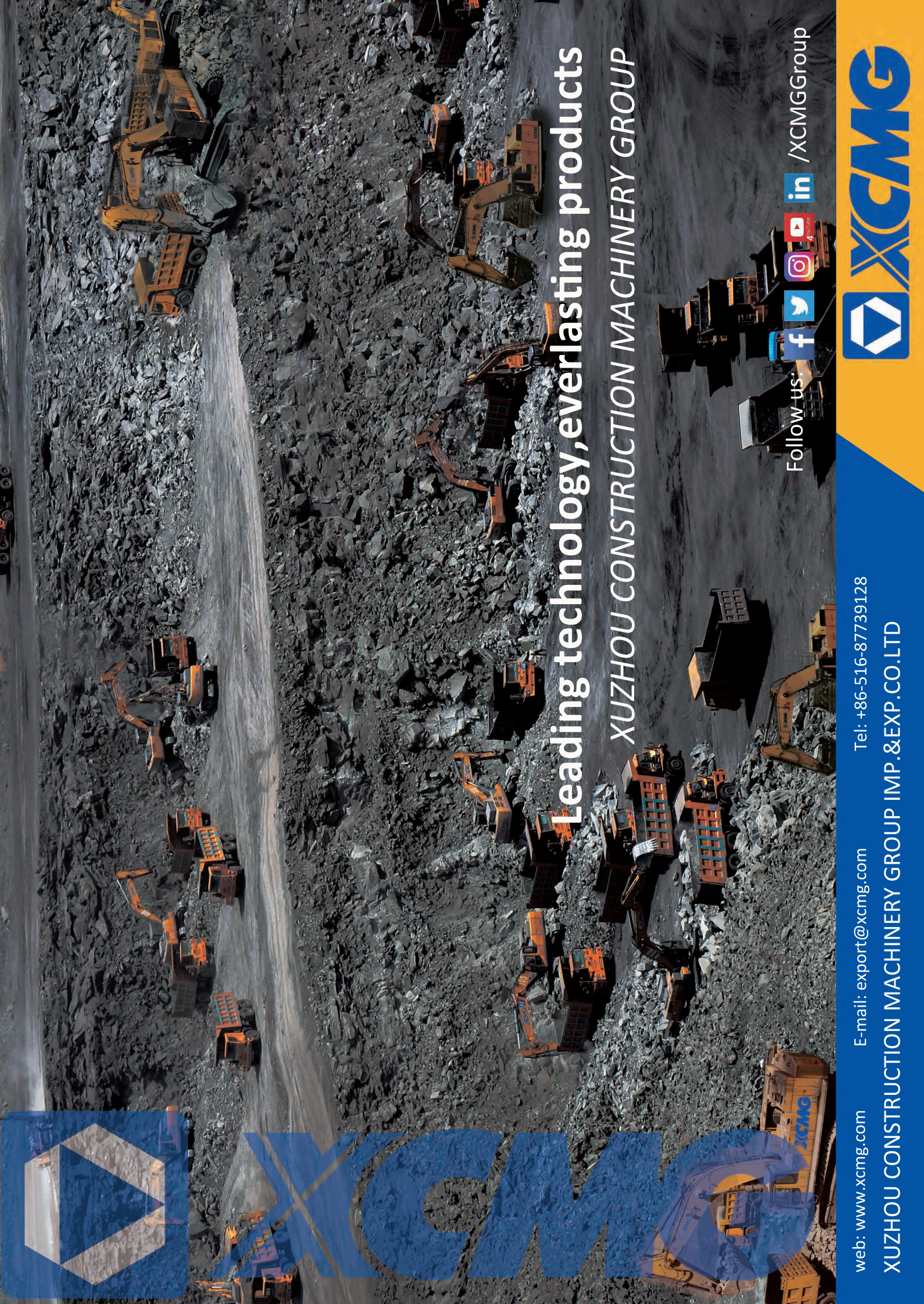
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Contents



On the cover:

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(page 52)

Cover designed by

Siti Nur Aishah

Publisher

Steven Ooi (steven.ooi@tradelinkmedia.com.sg)

Associate Publisher

Eric Ooi (eric.ooi@tradelinkmedia.com.sg)

Editor

Fabia Sugandy (seac@tradelinkmedia.com.sg)

Marketing Manager

Felix Ooi (felix.ooi@tradelinkmedia.com.sg)

**Head of Graphics Department/
Advertisement Coordinator**

Fawzeeah Yamin (fawzeeah@tradelinkmedia.com.sg)

Graphic Designer

Siti Nur Aishah (siti@tradelinkmedia.com.sg)

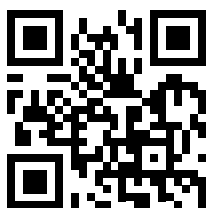
Circulation

Yvonne Ooi (yvonne.ooi@tradelinkmedia.com.sg)

Any other matters : info@tradelinkmedia.com.sg

Website: http://seac.tradelinkmedia.biz

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NEWS

NEWS IN ASIA PACIFIC	12
NEWS IN ASIA PACIFIC & THE MIDDLE EAST	26
GLOBAL NEWS	30
IPAF HIGHLIGHTS	34

EVENTS

CALENDAR OF EVENTS	32
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PRODUCTS

NEW IN INDUSTRY	36
MIXED CATEGORY	42



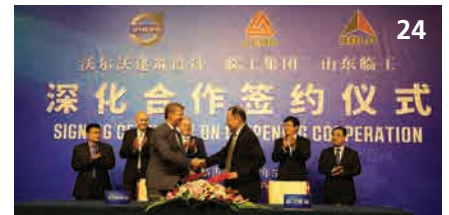
12



16



20



24



14



26



18



36



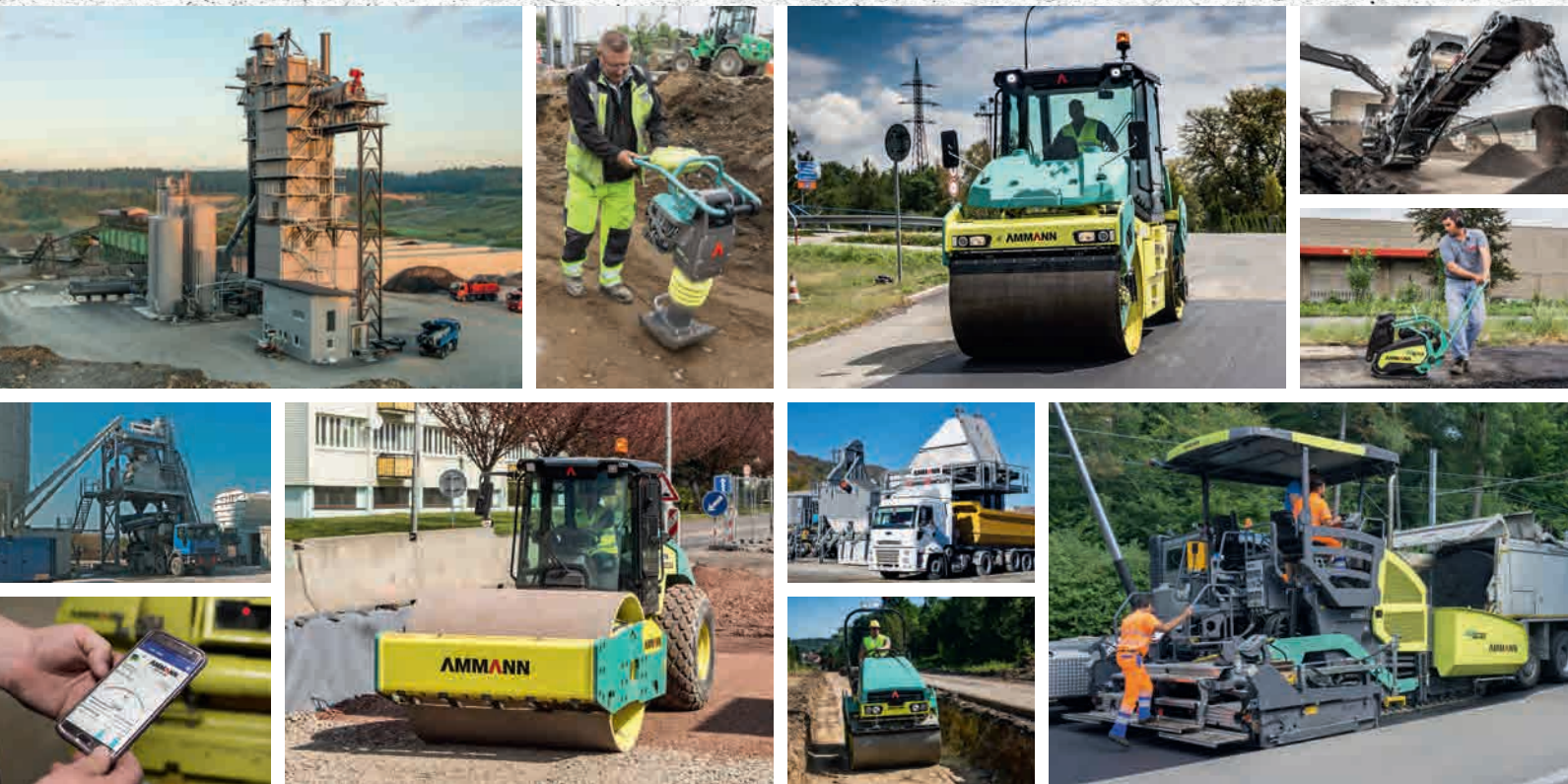
41

150

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Contents

PROJECTS & SPECIAL FEATURES

APPLICATIONS ON SITE	44
EDUCATIONAL FEATURE	48
INDUSTRIAL PROJECT	50
FOCUS ON SOUTHEAST ASIA	52
PRODUCT FEATURE	58
REVIEW OF BAUMA 2019	60



44



46



48



38



50



40



58



60

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INTERNATIONAL SALES OFFICE:

T. Asoshina/Shizuka Kondo, ECHO Japan Corporation
 Grande Maison Rm 303, 2-2, Kudan-Kita 1-Chome, Chiyoda-ku, Tokyo 102, Japan
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Work starts on new district for Philippines' New Clark City

Work has started on a new city district masterplanned by Broadway Malyan within the New Clark City development in the Philippines.

New Clark City is currently being developed to the north of the capital Manila and when completed, it will be home to more than a million residents. This new city is expected to address growing environmental problems caused by climate change, with a planning focus on resilience in a region that has been heavily impacted by natural disasters.

The project is being led by the Philippine Bases Conversion and Development Authority (BCDA) in partnership with a number of private developers. Broadway Malyan was commissioned by Filinvest Land Inc to masterplan a 288-ha district on the edge of the commercial centre and next to the city's main central park.

According to Broadway Malyan, the Filinvest New Clark City masterplan follows a 'live-work-play-learn' model with a diverse range of integrated land uses, including a specialist industry-focused university campus, affordable residential districts, an innovation and industrial park, hotels and a mixed-use commercial centre with lifestyle and community uses.

"A key aspiration for this project was to move towards non-motorised forms of transport," said Ed Baker, director at Broadway Malyan. "This is facilitated by shaded streets designed for pedestrians and cyclists and urban blocks in the city centre that have been designed and broken down in to a finer grain of pedestrian-only connectors that encourage ease of movement and permeability and encourage more street life and ground floor activities.

"The planning has placed a particular importance on the creation of a district-wide open space and place-making



LEFT, BELOW AND BOTTOM: **Broadway Malyan** has been selected by Filinvest Land Inc to masterplan a 288-ha district within the New Clark City development.

BELOW LEFT: **Work on the new district recently commenced.**



All images © Broadway Malyan

strategy, creating a connected network of unique and accessible public spaces that provides ecological and recreational value for the surrounding communities.

"This strategy includes the integration of the existing hydrology, topography and flora and fauna within the masterplan where possible with a key landscape feature being the river valley 'Loop Park' that runs through the centre of the scheme and connects the different neighbourhoods."

The 9,450-ha New Clark City was first inaugurated in 2016 and is set to become one of the world's most environment-friendly cities. Its goal is to be pollution free through a significant focus on pedestrianisation and public transport, energy efficient buildings built predominantly from lahar, a locally sourced material produced during volcanic eruptions and public utilities using greener energy sources such as solar power, liquefied natural gas and waste-to-energy facilities.



As part of the first phase of development, the city will host the 30th South East Asian Games, scheduled for late 2019 with the New Clark City Sports Complex and accommodation for the participants currently under construction.

The city is also planned to be the location for the new National Government Administrative Centre, as part of a programme to centralise all government agencies as well as providing a 'back up' in the event of a natural disaster, with government buildings moving from the capital to New Clark City during the early construction phases. ■

Singapore to have 'first large-scale floating solar system' by 2021

Singapore's national water agency PUB plans to install a 50 megawatt-peak (MWp) floating solar photovoltaic (PV) system on Tengeh Reservoir by 2021. It is said to be the first single large-scale floating solar PV system in the country.

PUB is also in the process of implementing two other smaller 1.5-MWp floating solar PV systems on Bedok and Lower Seletar reservoirs. The construction tender for these two projects has closed and is set to be awarded in the third quarter of this year. The systems are scheduled to be in place by early 2020.

Upon completion, the Tengeh floating solar PV system is expected to be one of the largest single floating solar PV systems in the world. It will generate green energy to power water treatment and will offset 7% of PUB's current energy needs, reducing Singapore's carbon footprint at the same time. PUB said that because solar energy does not involve the burning of fossil fuels, the Tengeh floating solar PV system will eliminate the need to emit 28,000 t of carbon dioxide every year that it is in operation. ■

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Sandvik appoints new distributor in Malaysia

Sandvik Mining and Rock Technology has appointed Wedago (WDG) as its new sole distributor for mobile crushers and screens in Malaysia. WDG will also provide aftermarket support for its customers.

WDG Resources Sdn Bhd, a member of Wah Seong Corporation Berhad, employs personnel with more than 30 years' expertise and experiences in the power generation and construction equipment industries. The newly added Sandvik products are expected to complement WDG's existing offerings.

WDG's facility is located strategically in Bukit Kemuning and the company has a dedicated team of service personnel with eight branches throughout Malaysia - in Kelantan, Johor Bahru, Kuantan, Klang Valley, Butterworth, Sibul Kuching and Kota Kinabalu.

"We are delighted to work with such a trusted supplier," said Paulo Prazeres, sales manager for Sandvik Mobiles in Asia. "Their industry expertise and local customer knowledge provides great synergies with our products. This, combined with their strong aftermarket support, will enable us to take our growth to the next level."

This new distributorship reinforces Sandvik's commitment to customer focus, through the provision of locally focused support whilst at the same time allowing customers to benefit from dealing with a global company.



FROM LEFT: Danny Ang, managing director of WDG; Paulo Prazeres, sales manager for Sandvik Mobiles in Asia; and Jules Lee, sales manager of WDG.

Goh Eng Hooi, group CEO for Infrastructure Trading and Services Division that owns WDG Resources commented, "The appointment of WDG as a Sandvik dealer will have a positive impact on the Division's structure in terms of product diversification that is synergistic to our existing market sectors. This aligns with our related business in building materials and infrastructure equipment, as many of our current customers and suppliers also operate in quarrying, batching plants and related industries in which Sandvik has presence. ■"

Surbana Jurong and Silk Road Fund form co-investment platform in Southeast Asia

Surbana Jurong has entered into a framework agreement with Silk Road Fund, a medium- to long-term investment fund dedicated to support the Belt and Road Initiative (BRI), to implement the China-Singapore Co-Investment Platform focusing on infrastructure projects primarily in Southeast Asia.

Under the agreement, the partners will set up a co-investment platform that is primarily focused on greenfield infrastructure projects in Southeast Asia. Both of them expect to invest about US\$500 million over the next few years, with each partner investing in principle equal amounts in the projects.

Investments of the platform could take various forms, including equity and debt. This partnership was initiated and facilitated by Infrastructure Asia, a regional infrastructure project facilitation office under the Singapore government.

Surbana Jurong, which will invest through its investment arm, Surbana Jurong Capital, will leverage its familiarity with local markets through having offices in these BRI countries and recommend projects to the Platform, and the two partners will then jointly assess the suitability of the projects for investment.

Such collaboration will leverage the partners' strengths for optimal investment returns. Surbana Jurong, as one of the largest Asia-based urban and infrastructure consultancies, has over 70 years of successful project deliveries and multi-disciplinary operating teams in over 40 countries, giving it insights into projects' viability. Silk Road Fund brings to the partnership years of experience and expertise, having invested in dozens of infrastructure projects in diverse markets. It also boasts wide networks within and outside China and has strong access to capital. ■

Nishio Rent All acquires United Power & Resources

Strengthening its ongoing expansion of overseas networks, Japanese equipment rental company Nishio Rent All Co Ltd has acquired United Power & Resources Pte Ltd (UPR) as a wholly owned subsidiary.

Based in Singapore, UPR has been supplying generators and ancillary equipment. The company handles rental for both large outdoor events and construction sites. It has subsidiaries in China, the Philippines and Indonesia.

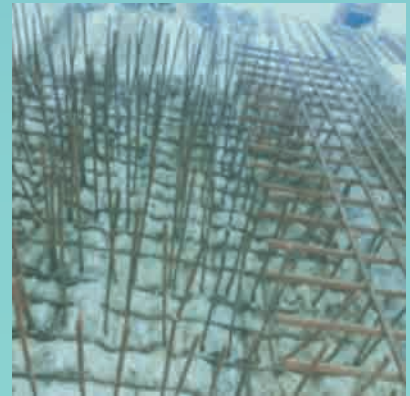
"By incorporating UPR, we aim to reinforce consulting rental by using its experiences in offering generators at the large event sites where UPR excels, and combining it with products such as large tents, seats and large air conditioners where the event department of the company specialises," said Masashi Nishio, CEO of Nishio Rent All Co Ltd. "Moreover, this acquisition enables us to utilise our assets - a number of large tents which we introduced for the 2020 Olympics."

Mr Nishio continued, "In the field of construction equipment, we also gain a foothold for expansion in the valuable Chinese market." ■



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CapitaLand unveils design for One Pearl Bank

At 178 m high, One Pearl Bank is set to be the tallest residential development in the Outram-Chinatown district in Singapore, offering panoramic views that extend from the central business district to Sentosa. It is scheduled for completion in 2023.

Designed by Serie+Multiply, a joint venture between London-based Serie Architects and Singapore-based Multiply Architects, One Pearl Bank will feature 39-storey towers linked at the roof by sky bridges, with a total of 774 apartments. It will also have a series of sky allotment gardens arrayed vertically at one edge of each tower.

With each tower featuring an allotment garden every four storeys, and each garden housing 11 plots, One Pearl Bank will have a total of 18 sky allotment gardens with close to 200 plots where residents can grow their own herbs, fruits and vegetables. These gardens are intended not only to support urban farming, but also to provide spaces for community bonding.

The allotment gardens are further complemented by two sky terraces and two roof gardens across the two towers and a sunken planter in every balcony, to maximise the greenery on the development's facade.

Taking full advantage of the sloped topography, the two towers are lifted 21 m off the ground to allow a visual continuity flowing from the greenery of Pearl's Hill City Park to the upcoming green connector to Fort Canning Park.



According to CapitaLand, over 500 trees across 35 species and more than 135,000 shrubs, plants and flowers will be planted throughout One Pearl Bank, occupying over 60,000 sq ft of space – this is said to be equivalent to 75% of the total site area. ■



All images © CapitaLand



ALL IMAGES: One Pearl Bank will have 39-storey towers linked at the roof by sky bridges, plus a series of sky allotment gardens .

Vinci Construction wins wastewater treatment plant contract in Vietnam

The consortium comprising Vinci Construction Grands Projets (50% share and lead contractor) and Acciona Agua SA has won a contract for the design-build portion of phase 1 of the Nhieu Loc-Thi Nghe wastewater treatment plant in Ho Chi Minh City (HCMC), Vietnam. It is scheduled to be completed in five years, including the starting-up process and acceptance of works. The project also calls for operating and maintaining the facility for a five-year period.

The new wastewater treatment plant, which is financed by the World Bank, has a total cost of €200 million (€170 million for the design-build portion and €30 million for operation and maintenance). With a peak capacity of 34,000 cu m per hour, it will incorporate a pumping station, biological treatment, disinfection, sludge treatment, odour treatment and also connection to the city's sewage system.

The plant, which will treat wastewater from the Nhieu Loc-Thi Nghe Basin, will be an essential part of HCMC's second environmental plan and is expected to benefit more than a million residents. The project aims to hire up to 800 local workers at peak periods. In addition, nearly 25,000 hours of training are planned to ensure everyone's safety at the worksite as well as the structure's quality. ■

Pöyry plays role in Thailand wind farm projects

International engineering consultancy company Pöyry has secured a contract from B. Grimm Power Public Company Limited for the 16-MW Bo Thong Wind Farm in Mukdahan province, Thailand.

Pöyry's scope of work includes EPC bid evaluation and negotiations, energy yield assessments, project management, design review and site monitoring during construction and commissioning. The wind farm's target commercial operation date (COD) is September 2020.

In addition, Pöyry has recently been involved in the construction of 260-MW Hanuman Wind Farm in Chaiyaphum province. Owned by the Energy Absolute Public Company Limited (EA), the project has already entered its commercial operation. It consists of five sub-projects and is set to be one of the biggest of its kind in Thailand.

For this Chaiyaphum contract, Pöyry provided engineering services for the WTG erection and commissioning of the wind farms. This included reviewing and inspecting the WTG supplier's site management plans, progress reports and commissioning and testing reports, monitoring the actual progress of erection and commissioning works and regular reporting to owner, attending system walk downs to identify punch list items, as well as re-inspections after remedial actions by WTG supplier. ■



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LiuGong and UOB renew MoU for machinery financing

LiuGong and United Overseas Bank Limited (UOB) have renewed their Memorandum of Understanding (MoU) to facilitate machinery financing for LiuGong's customers in Southeast Asia, as the company expands its business across the region.

LiuGong and UOB have been collaborating since July 2018 to extend machinery financing solutions for LiuGong's vendors and customers in Southeast Asia. Under the terms of the new MoU, UOB will develop an end-buyer financing credit framework and offer asset financing and hire purchase or lease financing to LiuGong's customers in Indonesia and Thailand.

UOB will also provide LiuGong's supply chain with other financial solutions such as cash management, trade finance, working capital loans and hedging facilities. The financing support for LiuGong's customers will help the company drive the export of its construction equipment to the region, thereby growing its revenue.

Zeng Guang'an, chairman of LiuGong Group said, "As LiuGong continues to expand our overseas business, one of our key goals is to provide customers with complete solutions beyond our machinery and financing is a large part of these offerings. UOB gives us this opportunity in Southeast Asia."

"The consumption rate for LiuGong's machinery in Southeast Asia has been strong," said Chen Hao, president of LiuGong Machinery Asia Pacific Pte Ltd. "Our customers told us that they require machinery financing assistance, so we are happy to work with UOB to tailor made financing plans to them, thus providing a total solution."

Ronny Chng, head of Corporate Banking Overseas at UOB commented, "UOB is committed to providing integrated financial



LiuGong and UOB recently renewed their agreement to facilitate machinery financing for LiuGong's customers in Southeast Asia.

solutions that help companies optimise their business operations and expand across borders. Our unrivalled regional network connectivity, deep market insights, industry knowledge and strong expertise in supply chain financing enable us to support LiuGong as it expands its distribution network and increases its market share in Southeast Asia. We hope to work with more manufacturers from China to facilitate their growth plans in the region."

The MoU was signed at the New International Land-Sea Trade Corridor Introduction and Marketing Conference organised by the People's Government of Guangxi Zhuang Autonomous Region. ■

The Hari hotel on track for completion in 2020

The Hari hotel in Hong Kong, designed by Atkins, has recently topped out and is on track for completion in 2020. This luxury hotel builds on the success of Harilela family's signature hotel in London. It is believed to be the first hotel of the Harilela Group that carries its own brand in Hong Kong and Asia.

Atkins, a member of the SNC-Lavalin Group, was commissioned as architect and lead consultant to deliver the project from concept through to contract administration, as well as providing 'authorised person' services. The company has been working on the project since 2015.

Faithful+Gould, Atkins' project and programme management business, was commissioned to project manage the hotel development. The company provides project management, design management and contract management services throughout the design, procurement and construction phases of the redevelopment. ■



ABOVE: The Hari hotel topping out ceremony took place in April 2019.

FAR LEFT: The luxury hotel is slated for completion in 2020.

LEFT: An artist's impression of the development.

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SMEC awarded railway project in the Philippines

SMEC has been commissioned by Japan International Cooperation Agency (JICA), through Oriental Consultants Global (OCG), to provide detailed design on the Manila Clark Railway Project (MCRP North Line) and the North South Railway Project, South Line (NSRP South Line). SMEC said it will assist JICA in the preparation of documents for the detailed design of the civil, structural, architectural, mechanical and electrical works.

The MCRP North Line and NSRP South Line are two major sections of the Philippines' railway transport system, which aims to ease traffic congestion in Metro Manila and beyond, promote inclusive growth and improve transport and logistics services to currently underserved areas. SMEC has also provided basic and detailed design and construction supervision of the North South Commuter Rail (NSCR).

"We're proud to continue our successful partnership with Oriental Consultants Global Co Ltd on another major commuter rail project that will support economic growth and improve everyday

life for people in the Philippines," said Ric Yuzon, SMEC's country manager for the Philippines. "We bring railway engineering expertise from projects all around the world. This appointment, along with our previous work on the NSCR, consolidates our presence in the transport sector."

The MCRP North Line will feature approximately 50.5 km long from Malolos to Clark, and around 70 km up to New Clark City. The line will start at the city of Malolos, passing through the town of Calumpit in the Bulacan province, the town of Apalit and cities of San Fernando and Angeles until reaching the Clark International Airport (CIA), all in the Pampanga province. It will include viaduct, bridges, seven stations including an underground station in CIA, and about 45 ha of depot, workshops, operations control and training centres.

The NSRP South Line will be approximately 56.5 km long from the city of Caloocan to Calamba, plus around 13 km up to the proposed depot site at the University of the Philippines in Los Baños in the Laguna province. ■



The NSRP South Line will pass through several stations, including Biñan (left) and Cabuyao.

XCMG delivers major orders to Southeast Asia

XCMG has recently delivered its major orders to Southeast Asia, including 100 excavators (XE215) for use in various construction projects and 22 cranes (11 units of QY55KA_Y and 11 units of QY75KA_Y) for Indonesia's large nickel-iron mining project.

The company said the XE215 excavator has been upgraded to improve its performance and abrasion resistance with waterproof-grade IP67, so that it can operate smoothly in mountainous regions as well as in hot and humid climates. Both the QY55KA_Y and QY75KA_Y crane models, introduced earlier in February this year, have also been customised for the Southeast Asian market.

"The Southeast Asian market is full of energy, and XCMG provides high-quality products that are adapted to deliver optimal performance under different weather and geographical conditions. We've also established a global sales and service network that can promptly respond to problems, ensuring smooth construction progress," said Zhike Song, general manager of XCMG excavator machinery.

In addition, XCMG has been involved in many infrastructure projects across Southeast Asia. For example, the company's road machinery has joined Cambodia's highway construction, which spans 190 km to connect Phnom Penh and Sihanoukville. This is said to be a key project part of China and Cambodia's BRI (Belt



XCMG celebrates the delivery of its major orders to Southeast Asia.

and Road Initiative) cooperation. In Myanmar, XCMG's tunnelling equipment is currently working on the upper Yeywa hydropower station project.

"As the BRI deepens cooperation across Southeast Asia, XCMG will seize opportunities and develop in the local markets with our 'Advanced and Endurable' products, one-stop construction solutions and worry-free services," said Mr Song. ■

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Zoomlion has new dealer for Singapore market

Antar Cranes Services, a subsidiary of JP Nelson Equipment, has been appointed as the exclusive dealer for Zoomlion crawler cranes in Singapore. The signing of the agreement recently took place during the Changsha International Construction Equipment Exhibition in May 2019, which was held at the Changsha International Convention and Exhibition Centre, Hunan province.

Founded in 1999, Antar Cranes provides rental and sales of mobile cranes including crawler cranes, telescopic crawler cranes and rough terrain cranes, among others. The company has been involved in various projects across Singapore, such as commercial and residential buildings, land reclamation works and other industrial developments.

According to Antar Cranes, this new dealership will offer a wider range of models to meet the growing demand for crawler cranes in Singapore. "Zoomlion is a well established global manufacturer, which produces quality equipment that complies with international standards. We believe their crawler cranes will fulfil the requirements of our local customers," said Andrew Tan, general manager of Antar Cranes Services. ■



The signing of the dealership agreement between Zoomlion and Antar Cranes took place in May 2019.

Kobe Steel turns Indian JV into full subsidiary

Kobe Steel has turned its Indian tyre and rubber machinery joint venture, L&T Kobelco Machinery Private Limited (LTKM), into a wholly owned subsidiary. The company manufactures, designs and sells rubber machinery used in making tyres for cars and construction equipment. Its products consist of rubber mixers and twin-screw rollerhead extruders.

Established in 2010, LTKM began as a joint venture with 51% held by Larsen & Toubro Limited and 49% by Kobe Steel. Following the latest change, Kobe Steel and its Singapore subsidiary, Kobelco Machinery Asia Pte Ltd, together now own 100% of LTKM and the company has been renamed Kobelco Industrial Machinery India Pvt Ltd (KIMI).

With this move, Kobe Steel plans to not only capture further demand in India, but also expand sales in Southeast Asia and Europe. ■



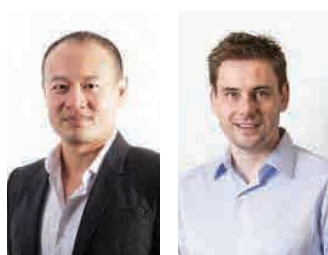
ABOVE: LTKM is located in Kanchipuram, Tamil Nadu, India.

LEFT: LTKM manufactures, designs and sells rubber machinery used in making tyres for cars and construction equipment.

Arup makes new appointments in Southeast Asia

Global engineering company Arup recently announced two new additions to its senior leadership team in Southeast Asia. Andy Hodgson has been appointed as Singapore's advisory services leader, and Tony Chan as associate principal for Southeast Asia's Cities and Planning team. Both of them will support the company in expanding its capabilities across Southeast Asia, furthering the aspirations of the Arup Future Cities Hub.

Mr Hodgson has more than 17 years of experience in infrastructure advisory. He specialises in providing strategic counsel to a range of clientele including developers, investors and government institutions. As the advisory services



Tony Chan (far left) and Andy Hodgson.

leader at Arup, Mr Hodgson will help clients across the region formulate infrastructure strategies, assess technical and commercial viability of investments, unlock enterprise value and set long-term plans to achieve economic development aspirations. He previously served as

director and regional transport advisory lead for Atkins Acuity in Singapore and Southeast Asia.

With a strong background of 19 years in sustainable urban development, Mr Chan specialises in leading multidisciplinary teams to efficiently integrate masterplanning and urban design with infrastructure projects. He joins from CPG Singapore and was previously a founding member of Arup's Planning, Development and Design team in Shanghai, where he led various projects. Mr Chan has since played a key role in a number of pivotal projects across the region, such as the creation of the Eastern Economic Corridor in Thailand. ■

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BCA supports leadership development in built environment

Singapore's Building and Construction Authority (BCA) has partnered the local built environment industry and academia to develop a new iBuildSG Leadership Engagement and Development (LEAD) framework to support leadership development within the sector. BCA is also working with the industry to pilot a new, voluntary Maintainable Design Appraisal System (MiDAS).

The iBuildSG LEAD framework is an initiative under the Construction Industry Transformation Map to develop leaders within the workforce who can drive sustained industry transformation efforts. Targeted at young emerging leaders, to potential and existing C-suite leaders, the framework aims to build leadership capability and capacity at various levels.

Firstly, at the industry level, the LEAD framework builds collective stewardship and develops networks for leaders to foster strong collaboration across the construction value chain. At the firm level, the framework supports firms in developing talent and growing their leadership pipeline so each firm has the bench strength to grow domestically and abroad. Lastly, at individual level, the framework helps industry practitioners build up their competencies to advance the sector, and recognises those with outstanding contributions.

There will be three leadership building platforms within the LEAD framework, anchored by two structured programmes: LEAD Horizon Programme and LEAD Milestone Programme. BCA will partner the Singapore Management University (SMU) as the anchor institution for both the Horizon and Milestone Training Programmes. In addition, BCA will collaborate with the Singapore University of Technology and Design (SUTD) on a technical track within the LEAD Horizon Programme to run an innovation bootcamp. To complement the above, a third platform, Insights@LEAD comprising a series of events and initiatives will further thought leadership and provide opportunities for co-creation through alignment and collaboration across the LEAD community.

MiDAS

As part of the initiatives to uplift the Facilities Management (FM) sector – a key focus under the Real Estate Industry Transformation Map – BCA has also brought together the industry, unions and other public agencies to form a Tripartite FM Implementation Committee



BCA has signed a collaboration agreement with SMU and SUTD for training programmes under the leadership framework.

(FMIC) to develop, oversee and review the implementation of the sector's transformation plans. FMIC identified Design for Maintainability (DfM) as a key pillar in transforming the FM sector. DfM is the practice of integrating operations & maintenance considerations into project planning and design to achieve effectiveness, safety and economy of maintenance tasks.

BCA is working with the industry and two tertiary institutions - SUTD and the Nanyang Technological University (NTU) - on MiDAS to assess the degree of maintainability of building designs from the lens of labour efficiency and cost-effectiveness of downstream maintenance regimes.

Through MiDAS, BCA aims to: foster greater collaboration among designers, developers and FM practitioners to deliver better and more maintainable designs; promote holistic sustainability by considering not only environmental aspects but also economic and social through reducing costs and reliance on manual labour for building maintenance; and enable designers and developers to make more informed design decisions upfront and take a life-cycle view of the development – including considerations for not only initial capital expenditure but also operating expenses.

According to BCA, MiDAS will be piloted in about 10 public and private projects including the new Surbana Jurong Campus, Ascendas Singbridge's integrated development, Ascent, and PSA's new office building at Pasir Panjang. ■

Volvo and SDLG consolidate 15-t excavators into one product line in China

Volvo CE and SDLG are extending their cooperation to further accelerate growth in conjunction with the upcoming China IV emission standards. Both companies are currently manufacturing and selling their own separate excavator product lines in China; but starting from December 2020, all of their excavators from 15 t for the Chinese market will be consolidated into one product line, based on the latest Volvo technology and branded Volvo.

Since Volvo CE acquired 70% of SDLG in 2007, net sales have reportedly grown from approximately SEK 3 billion to SEK 17 billion with good profitability. SDLG has a strong market position in wheel loaders and has successfully entered the excavator market with technological support from Volvo CE.

"Bringing our larger excavator businesses in China together will maximise our ability to serve customers in China," said Melker Jernberg, president of Volvo CE. "SDLG has been a great success



Volvo CE and SDLG are extending their cooperation to meet the upcoming China IV emission standards.

since we began our cooperation in 2007. With sales of both brands growing and our cooperation getting ever closer over the years, this is a natural next step for us." ■

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RSP designs Hindu Mandir cultural complex in UAE

The foundation stone laying ceremony for the first Hindu Mandir cultural complex in the Middle East recently took place at the Bochasanwasi Shri Akshar Purushottam Swaminarayan Sanstha (BAPS) Hindu Mandir site in Abu Dhabi, UAE. This ceremony is a sacred Hindu ritual where the first foundation stones are sanctified and fixed in the ground as the base of the Mandir.

Slated for completion in 2022, the BAPS Hindu Mandir aims to facilitate interfaith dialogue, pluralism and universal human values, and serve the 3.3 million Indians residing in the UAE and millions of international tourists annually visiting the UAE. Constructed on a 13.5-acre land in Abu Dhabi that is located in close proximity to two major highways in the UAE, the development will be highly accessible to visitors from all over the UAE.

The traditional stone Mandir will feature a multifaceted, multifunctional cultural and spiritual centre. As the largest place in the UAE for people of all faiths to come and experience the Hindu culture, the BAPS Hindu Mandir complex will serve as a centre of art, culture and values, and house facilities such as a visitor centre, convention halls, a 1,500-seat dining hall, learning facilities and sports areas to meet the needs of the UAE community.

BAPS, along with Mandir Limited, had appointed RSP Architects Planners & Engineers as lead consultant and designer on the project. This iconic landmark will be built according to ancient Hindu Sanskrit scriptures of architecture, featuring marvel of seven spires that represent the seven emirates in the UAE, and five ornate domes. Entirely sculpted from stone, the exterior of the Mandir will be made of pink sandstone from Rajasthan, India and the interior from white marble. Every corner and crevice will be intricately hand-carved by hundreds of artisans in India. Thousands of such stone pieces will be shipped to the UAE and assembled on site like a giant 3D jigsaw puzzle.

RSP said its design concept for the Mandir takes inspiration from the project's location and seeks to establish a tranquil oasis



ABOVE AND LEFT: RSP Architects Planners & Engineers has been appointed as lead consultant and designer for the BAPS Hindu Mandir cultural complex in Abu Dhabi, UAE.

Both images © RSP Architects Planners & Engineers

in the desert. An oasis is a safe haven and retreat, which provides travellers with food, water and shelter in the harsh conditions of the desert. This concept of a green retreat is brought into the centre of the site. From the dunes of the desert rise the monolithic stone blocks. These stone masses root the scheme to the Earth and blur the lines between architecture and nature. The monumental volumes enclose the centre to create a protected environment from the external world. ■

Yongnam secures various contracts in Singapore, HK and India

Yongnam Holdings Limited, Singapore-based structural steel contractor and specialist civil engineering solutions provider, has secured five contracts totalling S\$120.8 million in Singapore, Hong Kong and India.

One of the contracts in Singapore is a subcontract for North-South Corridor project from Yongnam's 30%-owned joint venture with CIMIC Group's Leighton Asia. The joint venture had secured the N103 contract awarded by the Land Transport Authority (LTA) last year to provide design and construction works. For this subcontract, Yongnam will supply, install and dismantle temporary earth retaining systems for the construction of North-South Corridor (Tunnel) between Kampong Java Road and Suffolk Walk. The subcontract is expected to commence in the second half of 2019 and to be completed within 36 months.

For the second contract in Singapore, Yongnam will undertake specialist civil engineering works including the design, supply, installation and dismantling of temporary earth retaining works for an infrastructural development on the eastern part of Singapore. This subcontract will commence in July 2019 and be completed over 24 months.

Yongnam's third project in Singapore will cover the supply, fabrication and erection of structural steelwork for the construction of a new single-user factory. This contract is expected to be completed in the second quarter of 2020.

In Hong Kong, Yongnam secured a contract to undertake specialist civil engineering works for the Tseung Kwan O – Lam Tin Tunnel Road P2 and associated works project. The company will supply, fabricate, deliver, install and dismantle walings and struts for reinforced concrete structural works of the U-Trough and P2 Underpass in the reclamation area. This contract is planned to commence in August 2019 and be completed over a period of 36 months.

In India, Yongnam won a contract to supply, fabricate and install structural steelwork for the roof of Kempegowda International Airport Terminal 2 in Bangalore. It was awarded by repeat customer Larsen & Toubro, which had also awarded Yongnam a contract to build the roof structural steelwork for the Delhi International Airport Terminal Building in 2008. The project is expected to start in the second half of 2019 and to be completed within 12 months. ■

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Aurecon helps build Sharjah's House of Wisdom

In celebration of Sharjah's status as the UNESCO World Book Capital 2019, His Highness Sheikh Dr Sultan bin Mohamed Al Qasimi, supreme council member and ruler of Sharjah, unveiled the 'House of Wisdom' in April 2019. This iconic library and culture centre is being developed by Sharjah Investment and Development Authority (Shurooq) and designed by Foster + Partners.

Aurecon was engaged to provide engineering services for structural, mechanical, electrical, plumbing, geotechnical, utilities, transport planning, roads, facades, BMU, vertical transportation, security, AV, ICT and communications, fire/life safety, waste management and acoustics. The two-storey development is located on the Sharjah International Airport Road, about 10 km from the city centre. It is scheduled to open in 2020.

The design intent of the House of Wisdom was to create a harmonious learning space through human centric approach. In pursuit of this, the double-height transparent facade creates a grand space to bring the community together, welcoming in the natural beauty and daylight of the surrounding landscape into the library.

Complementing the facade is the cantilevered 'floating roof', which extends 15 m out over the facade to ensure the building is shaded during the peak of Sharjah's day, while aluminium screens with differing densities filter the low evening sun.

The roof provides a peaceful and conducive learning space within the library, while minimising the building's environmental



© Foster + Partners

The House of Wisdom in Sharjah, UAE, is scheduled to open in 2020.

footprint by reducing demand on the mechanical and electrical systems needed to keep the building cool.

The floating roof is supported by four cores, thus creating a large column-free floorplate for a diverse suite of comfortable spaces that the community will use for exhibitions such as the Sharjah International Book Fair, publishing fairs and children's reading events. When completed, this modern building will reflect the legacy for future generations, and how education will be transformed in the Emirate. ■

Aurecon appoints new leaders to drive growth in Asia

Aurecon has appointed Stephane Asselin as its new managing director for Asia. The region is currently a key area of focus for Aurecon, as the company targets rapid expansion to capitalise on the network of offices and clients it has developed in Asia over the past 10 years.

"Asia is a fast-paced region where there are many challenges and opportunities around sustainability, urbanisation, digital transformation and infrastructure. I believe Aurecon is well-placed to take a leading role in accelerating Asia's development, with the best mix of people, technology and eminence to drive real progress," said Mr Asselin, who is based in Hong Kong.

A senior and experienced commercial leader, Mr Asselin has spent over half of his 25-year career living and working in Asia. He has a proven track record in delivering business outcomes and developing a strong talent base focused on executing strategy. Previously, Mr Asselin served at executive level with a range of engineering, environment and architectural consultancies, including as the executive vice president for Southeast Asia at AECOM. More recently, he held several senior advisory roles across Canada and Asia.

With a passion for the infrastructure, marine, water, energy, and environmental sectors, Mr Asselin has worked on projects across Asia as well as in North America, Europe and the Middle East. Some of his most recent experiences include helping Vietnam-based Atlas Industries in its expansion into the North American market, and with Canadian government-owned company Société du Plan Nord, where he led the company's infrastructure and environmental spending programmes.



FAR LEFT: **Stephane Asselin**, Aurecon's managing director for Asia.



LEFT: **Chris Deakin**, Aurecon's rail leader for Asia.

In addition, Aurecon has appointed Chris Deakin as its rail leader for Asia. He will be responsible for leading, developing and managing the rail and mass transit service line and teams within Aurecon's Asia business. Based in Singapore, Mr Deakin will lead key relationships with clients and industry partners to enhance Aurecon's market growth and positioning. He will also lead the digital delivery programme for the Singapore infrastructure business.

Mr Deakin has more than 18 years of international experience in leading, designing and managing major infrastructure projects. His track record includes metro and high-speed alignment designs for Singapore, systems engineering in Malaysia, light rail in Australia and detailed permanent way design and construction projects for heavy rail in the UK. He is a skilled Permanent Way, Trackwork and Alignment engineer with design, installation and management experience, accompanied by strong digital engineering knowledge. ■

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Surbana Jurong to work on Mexico projects

Surbana Jurong will be developing a strategic plan for the Interoceanic Corridor and masterplanning two economic development areas in the states of Veracruz and Oaxaca in Mexico. The project was awarded by Mexico's state government of Veracruz and Oaxaca, marking a significant milestone as Surbana Jurong continues to expand its presence in the North American market.

The Interoceanic Corridor is 40-km wide and 300-km long and it will connect the port of Salinas Cruz on the Pacific coast to the port of Coatzacoalcos on the Atlantic. Strategically located with direct maritime links to China's Belt and Road Initiative's Eastern Asian terminal point and Western Europe end, the corridor will broaden market opportunities and drive economic growth for the southern states of Mexico by facilitating international trade and investment.

Surbana Jurong's scope of work will include a detailed review of the Interoceanic Corridor, including its broad socio-economic benefits to the region and potential growth industrial clusters. The strategic plan will comprise recommendations on market positioning and development directions to facilitate potential growth opportunities in jobs and industry sectors. It will also include proposals for utilities and services infrastructure development, and zoning plans to identify land use distribution along the corridor.

In addition, Surbana Jurong will develop the masterplan for two economic development areas within the Interoceanic Corridor



Teo Eng Cheong, CEO International of Surbana Jurong (far left), and representatives from Mexico's state governments of Veracruz and Oaxaca, after signing the agreement.

in the states of Veracruz and Oaxaca. The masterplan will guide the physical development of the two industrial sites through planning of land use, infrastructure, utilities and transportation. It seeks to lay the foundations for economic growth, create a conducive environment for investment and provide a quality living environment for the people that live and work in it.

Enterprise Singapore facilitated this partnership between Surbana Jurong and the Mexican government, following the signing of a Memorandum of Understanding (MoU) with Mexico in 2016. The MoU serves to help Singapore companies access opportunities in Mexico, in the areas of infrastructure and connectivity. ■

New president and CEO for T.Y. Lin



Global engineering company T.Y. Lin International (TYLI) has appointed Matthew G. Cummings (left) as its new president and chief executive officer.

A proven executive leader with over 30 years of comprehensive experience in the engineering field, Mr Cummings has held senior executive positions and previously led a US\$2 billion transportation infrastructure business at a global engineering and construction firm. He succeeds former president and CEO Alvaro J. Piedrahita, who transitions to a new role as chairman of the board of directors of TYLI Group.

"T.Y. Lin International has established itself as the go-to firm for solutions to the most difficult engineering challenges. We are globally recognised for setting the standards for excellence, innovation and incomparable technical solutions," said Mr Cummings. "I look forward to building on our momentum and furthering the firm's legacy of delivering remarkable infrastructure projects."

Among his main objectives, Mr Cummings plans to leverage the strength of and unite the various global infrastructure affiliates under TYLI's parent company, the Dar Group, a leading, privately owned, professional services group comprising some of the most recognisable names in the architecture and engineering industry. Playing a leading role under the Dar Group's infrastructure pillar, Mr Cummings is poised to bring the group together in a meaningful way for an expanded, global presence and in support of the Dar Group's mission of creating sustainable communities worldwide. ■

Terex sells boom truck, truck crane and crossover product lines to Load King

Terex Corporation has sold its boom truck, truck crane and crossover product lines to Load King, a subsidiary of Custom Truck One Source LP. Included in the transaction are the assets and parts business associated with these product lines.

"This transaction completes one of the portfolio actions we announced in February," said John L. Garrison, chairman and CEO of Terex. "We continue to implement our Focus, Simplify and Execute to Win strategy. By focusing on businesses where we have a strong market position, we can efficiently concentrate our improvement efforts to maximise value for our customers, team members and shareholders."

Fred Ross, CEO of Custom Truck One Source commented, "I am delighted to announce this acquisition and its launch of boom truck, crossover and truck crane product lines under Load King's brand. This is an important acquisition that expands our broad specialised truck and heavy equipment solutions offering."

Mr Garrison asserted that Terex will continue to sell parts to its boom truck, truck crane and crossover customers during an expected one-year transition period. "After completion of this transaction with Load King and the sale of Demag mobile cranes to Tadano, Terex will remain in the rough terrain and tower crane businesses," he said. "We will fulfil global demand for rough terrain cranes from our Crespellano, Italy facility, including the popular RT 100US and for tower cranes from our Fontanafredda, Italy facility. Customers can be assured that we will continue to sell parts and provide support to rough terrain, tower crane and other legacy crane products. We are investing in parts inventory and improving our operations to better serve these important customers." ■

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Date	Events in Asia	Organiser & Contact
1 to 3 Aug 2019	Conmart Expo 2019 China Import & Export Fair Pazhou Complex Guangzhou China	Overseas Promotion Tel: +86 156 2652 1558 Email: service@conmart.com.cn Website: conmart.com.cn
3 to 6 Sept 2019	International Built Environment Week (IBEW) Sands Expo & Convention Centre Singapore	Building and Construction Authority of Singapore (BCA) Tel: +65 6780 4530 Email: ibew@reedexpo.com.sg Website: www.ibew.sg
4 to 7 Sept 2019	BICES 2019 China International Exhibition Centre New Venue Beijing China	CCMA, CNCMC & CCPIT-MSC Tel: +86 10 6787 0812 Email: lisamayao@e-bices.org Website: www.e-bices.org
5 to 7 Sept 2019	Intermat ASEAN & Concrete Asia 2019 Impact Exhibition & Convention Centre Bangkok Thailand	Comexposium & Impact Exhibition Management Tel: +662 833 5315 Email: info@asean.intermatconstruction.com Website: asean.intermatconstruction.com
18 to 20 Sept 2019	Cambuild 2019 Diamond Island Exhibition & Convention Centre Phnom Penh Cambodia	AMB Tarsus Events Group Tel: +855 023 901 579 Email: somaly@ambtarsus.com Website: www.cambuildexpo.com
29 to 31 Oct 2019	MBAM OneBuild 2019 Kuala Lumpur Convention Centre Kuala Lumpur Malaysia	MBAM OneBuild Sdn Bhd Tel: +603 7981 0288 Email: info@mbamonebuild.com Website: www.mbamonebuild.com
5 to 7 Nov 2019	BuildTech Asia 2019 Singapore Expo Singapore	Sphere Exhibits Tel: +65 6319 4035 Email: buildtechasia@sph.com.sg Website: www.buildtechasia.com
6 to 8 Nov 2019	Konstruksi Indonesia 2019 Jakarta International Expo - Kemayoran Jakarta Indonesia	Tarsus Indonesia Email: sales@constructionindonesia.com Website: www.constructionindonesia.com
28 to 30 Nov 2019	Myanbuild 2019 Myanmar Expo Hall Yangon Myanmar	AMB Tarsus Events Group Tel: +959 2503 71296 Email: ei@ambtarsus.com Website: www.myanbuild.net
11 to 13 Dec 2019	World of Concrete Asia 2019 Shanghai New International Expo Centre Shanghai China	Informa Exhibitions Tel: +86 21 6157 7250 Email: info@wocasias.com Website: www.wocasias.com
24 to 27 Nov 2020	bauma China 2020 Shanghai New International Expo Centre Shanghai China	Messe München Tel: +49 89 949 20251, Fax: +49 89 949 20259 Email: info@bauma-china.com Website: www.bauma-china.com
Date	Events outside Asia	Organiser & Contact
4 to 7 Feb 2020	World of Concrete 2020 Las Vegas Convention Centre Las Vegas, Nevada USA	Informa Exhibitions Tel: +1 972 536 6368 Email: contactus@worldofconcrete.com Website: www.worldofconcrete.com
10 to 14 Mar 2020	Conexpo-Con/Agg 2020 Las Vegas Convention Centre Las Vegas, Nevada USA	Association of Equipment Manufacturers Tel: +1 414 274 0644 Website: www.conexpoconagg.com (email enquiries should be made online)

Note: The show organisers may change the dates of the event or postpone/cancel it without prior notice, so readers are advised to visit the show websites regularly for the latest information.

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Global MEWP fleet ‘nears 1.5 mil but uncertainty remains’

The mobile elevating work platform (MEWP) rental market is still booming, with the worldwide fleet nearing 1.5 million units, but uncertainty clouds longer-term outlooks, according to the latest market analysis from the International Powered Access Federation (IPAF).

For the past two years, IPAF’s Global Powered Access Rental Market Report was positive across the board, with the US in particular exceeding expectations and experiencing steady growth. The European MEWP rental market also sustained impressive growth across most key indicators in all 10 countries under study. In the UK and some Nordic countries, however, growth plateaued and outlooks were more pessimistic.

The European MEWP rental market as a whole began to show growth in 2015, and this was sustained in 2016 and 2017, with France seeing double-digit growth in 2017. This trend continued in continental Europe through 2018, with France and Italy experiencing 7% annual market growth, the Netherlands seeing an 8% increase and Germany and Spain growing by 9% and 10% respectively.

In 2018, the European MEWP rental market revenue was worth an estimated €2.75 billion, as the market has grown significantly (6%). The overall economic situation is good and both construction and non-construction sectors generated increased demand.

In the UK, continued intense market competition and uncertainty linked to Brexit forced rental rates down slightly (-2%).



IPAF’s Global Powered Access Rental Market Report is exclusively compiled each year by leading research intelligence company DuckerFrontier, formerly Ducker Worldwide.

In Nordic countries, especially Denmark and Finland, rental companies also faced strong overall pressure on rental rates, which remained static. MEWP rental still outstripped construction growth in Denmark, Germany, Sweden and the UK.

The level of investment remains significant, as rental companies focused on both expanding and renewing their MEWP fleets with more specialist, sophisticated and generally greener equipment. It seems 2018 may be a turning point and investment is expected to stabilise from 2019 onwards, said IPAF. The European MEWP rental market in particular continues a shift towards greener machines.

The market outlook in 2019 and beyond shows that uncertainty prevails, however, particularly in the UK, where Brexit is far from resolved, and the ongoing trade war between China and the US is starting to impact the exports of some European manufacturers, particularly in Germany. The 2020 presidential election

in the US is also an unknown beyond which few are confidently projecting favourable outlooks.

Nonetheless, the report shows that 2018 was another great year for the US market, with stronger-than-expected growth. Double-digit growth in MEWP rental revenue was recorded and total value exceeded US\$10 billion. The level of cross-hire increased in 2018, caused by strong ongoing market demand.

Sustained fleet expansion continued in 2018 and total MEWP fleet size now exceeds 600,000 units in the US. However, in light of the longer-term uncertainty, most US MEWP rental companies expect to scale back fleet expansion in the next few years.

Across 2018, the worldwide rental MEWP fleet size reached 1.47 million units, up from 1.35 million at the end of 2017. Strong growth in Asia is being driven mainly by China. Growth was reported in all countries and regions. The 2018 report also contains a special China market focus, which indicates almost exponential growth.

In 2018, the Chinese MEWP rental market value was US\$646 million – it was considered a good year: several major projects started during the second half of 2017 and positively impacted market growth in 2018. Outlooks remain positive for the next few years, despite challenges linked to increased competition and the fact that downward pressure on the economy may be reflected in the MEWP rental market. ■

IPAF wins court injunction against breach of copyright

IPAF has won an injunction against a former member firm that had attempted to copy its accredited training programme and pass it off as its own. The injunction was awarded against Capital Equipment Services Ltd (CESL) of Chennai, India, which had sought to copy and distribute IPAF’s training materials as its own MEWP operator course.

CESL and Aerial Platform Association of India, registered in Mumbai, which was also named in the injunction, were ordered by the High Court of Madras to desist from using or dealing with the copied course material.

“We welcome this injunction, which protects the hard work and co-operation of IPAF members around the world. We are pleased the Indian judicial system found decisively

in IPAF’s favour,” said Tim Whiteman, CEO and managing director of IPAF.

“IPAF training is created and shared in the greater interests of the industry. Our members continue to be involved in improving and developing IPAF training material to ensure our industry stays safe, and can rest assured we will rigorously defend any attempt to devalue or steal their hard work, wherever in the world such attempts occur.

“Use of the IPAF-accredited training programme is open to any member that meets the relevant rigorous quality standards; it is available exclusively to members of IPAF, who must observe our code of conduct. The member in this case has since been expelled.” ■

Successful MEWP standards event and PDS held in China

Around 100 delegates were in attendance for the inaugural IPAF MEWP Safety & Standards Conference, which took place on 16 May 2019 alongside the Changsha International Construction Machinery Exhibition in Hunan Province, China.

Delegates at the new conference heard from a range of speakers on international MEWP manufacturing and safety standards, with the overriding message being that MEWPs are a safe way to conduct temporary work at height, but robust safety standards are essential, particularly in rapidly growing markets such as China.

The programme included briefings from: Tim Whiteman, CEO and managing director of IPAF; Teng Rumin from the Dalian University of Technology; Bai Ri, IPAF's China representative; Andrew Delahunt, director of technical and safety at IPAF; Mark De Souza, safety and regulation manager at Haulotte; and James Clare, senior designer at Niftylift.

"In Asia we are seeing strong demand for IPAF training, safety and technical expertise. Events such as this will ensure our industry grows safely and sustainably," said Raymond Wat, IPAF's regional general manager for South East Asia.

IPAF also hosted its first ever Professional Development Seminar (PDS) event for instructors and training managers in China and the wider region. Held at the same venue as the MEWP safety



The inaugural IPAF MEWP Safety & Standards Conference took place during the Changsha International Construction Machinery Exhibition in May 2019.

conference, the IPAF Chinese PDS attracted around 30 attendees. The event is planned to be organised annually in line with the requirement for IPAF instructors worldwide, in order to engage with continuous improvement and to learn about developments in IPAF training and MEWP safety. ■

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Commando DC300Ri drill rig for various projects

Sandvik Mining and Rock Technology has developed a new surface top hammer drill rig, the Commando DC300Ri, which is suitable for various construction applications. This new machine has a vast hole size range (from 38 to 64 mm) using R28, R32 and T35 MF-rods. It is equipped with four-wheel drive motors and oscillation, ensuring excellent mobility and stability in difficult terrain.

Together with a new boom structure and an HL300 rock drill, the Commando DC300Ri offers high productivity and low operating costs in challenging environments. This fully radio remote-controlled, rubber tyred drill rig features four tramping motors with maximum tramping force of 43 kN in total. Rubber tyres and the ± 10 degree oscillation contribute to the machine's great manoeuvrability.

A new re-enforced boom structure with extended swing and reach results in 20% larger coverage area (compared to earlier models) equalling 12 sq m. A flushing air capacity of 3 cu m/min allows a deeper hole depth with larger hole sizes, and the 24-V electric system adds durability.

The advanced iTorque drilling control system available in its size class makes the Commando DC300Ri top-of-the-line in drilling performance and guarantees longer steel life. The intelligent compressor control system and new Cat 3.6 74.4-kW Tier 4F / Stage 5 engine contribute to high fuel efficiency; adding up to more than 30% improvement compared to earlier models in the same size class, said Sandvik. The machine is also available with a Tier 3 engine.

The Commando DC300Ri follows the same modular design as other smaller Sandvik next generation surface drill rigs. Such a design ensures high uptime with easily accessible service points, on-board diagnostics and small transportation dimensions. Being only 2.85 m in height, the rig can be quickly and easily transported from site to site on a small truck or even a trailer. It has a width of 2.35 m and length of 5.7 m.

Wide hole range and application specific on-board options make the Commando DC300Ri a multipurpose drill rig. It suits various civil construction works, such as road and railroad jobsites, trenching, channelling and different foundation works. The extended reach and the optional



ALL IMAGES: The new Commando DC300Ri is a fully radio remote-controlled, rubber tyred drill rig suitable for various construction applications, such as road and railroad jobsites, trenching, channelling, tunnelling and foundation works.



hydraulic rollover, which enables the feed to rotate 360 degrees, make the machine also a good fit for dimensional stone drilling and secondary breaking.

With smaller hole sizes, the Commando DC300Ri is ideal for tunnelling applications as well. The hydraulic rollover is a necessity in bolting and grouting, and the optional one-rod adding system gives flexibility and safety. A special fast-tramping option for tunnelling allows the drill rig to keep up with the other fast-moving machines underground. Other essential options for tunnelling include the exhaust gas purifier (for Tier 3 engine), water flushing and LED lights.

What's more, the Commando DC300Ri can be further equipped with several intelligent options to suit specific needs, such as auto-aligning, SanRemo remote monitoring and Remote Screen. ■

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Manitou launches new machines for emerging markets

Manitou has introduced two telehandlers and two compact loaders targeted at the emerging markets, including Asia, the Middle East and Eastern Europe.

The new Manitou MXT 840 and Gehl TX 408 telehandlers can perform a vast array of jobs, thanks to their wide range of attachments such as forks, buckets, winches and gondolas. Featuring a 7.60 m lifting height for a maximum capacity of 4 t, these machines are suitable for building construction and can easily extend to two stories, said Manitou.

Both the MXT 840 and TX 408 offer three steering modes: two-wheel steering, four-wheel steering or crab mode to make lateral movement easier. With a high ground clearance of 39 cm, the telehandlers are especially good for crossing difficult terrain. The transmission consists of a torque converter gearbox. In the cab, the controls are intuitive to enable users learn the ropes quickly and gain efficiency on the site.

The two new compact loaders - Manitou 1340R and Gehl R134 - also come with many choices of attachments, including buckets, sweepers and breakers. Being versatile machines, they can carry out a number of jobs on the same site, eliminating the need for different equipment.

Powered by a 49-hp engine and a torque converter transmission, these compact loaders have a lifting height of 3.58 m for a maximum capacity of 608 kg. With a compact dimension of 1.3 m wide and 1.9 m high, the machines can manoeuvre in tight areas on building construction sites. They can also easily enter and leave basements or parking lots, saving movement time and increasing user productivity.

Both the 1340R and R134 are ideal for road construction, particularly for filling dump trucks, thanks to their 2.2 m dump height and maintenance of their axles without interrupting traffic, with a turning radius of just 1.75 m.

To ensure safety, the new loaders comply with the FOPS/ROPS standards and are equipped with a handrail and safety belt. The boom and chassis are made of high-resistance steel, making the machines highly durable and reliable, even in difficult conditions. The controls inside the cab are ergonomic to allow operators learn the ropes quickly and deliver greater productivity. Maintenance is also optimised with easy access to daily maintenance locations, speeding up recurring inspections. ■

Website: www.manitou-group.com



TOP AND ABOVE: Manitou MXT 840 and Gehl TX 408 telehandlers provide a 7.60 m lifting height for a maximum capacity of 4 t.

BELOW LEFT AND BELOW: Manitou 1340R and Gehl R134 compact loaders have a lifting height of 3.58 m for a maximum capacity of 608 kg.





Customer voice is our guiding light

Hydraulic Excavator
PC210-10M0

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Models shown may include optional equipment. Available models may vary by region or country. Materials and specification are subject to change without notice.

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Auger Torque offers mast-based drilling rig and mulcher

The mast-based drilling rig from Auger Torque is designed for accurate, quick and efficient drilling of large quantities of equal diameter holes. It is suited to applications such as auger drilling and down-the-hole hammer applications, as well as pre-drilling for pile driving, dewatering, permanent retaining walls and auger cast piles.

The high-performance, hydraulically driven drilling rig is ideal for excavators between 12 and 15 t, with a torque range from 2,717 to 8,152 Nm. The rig can move from one project to the next with ease, and being excavator mounted offers a quicker and more cost-effective method compared to more specialised heavy equipment.

Other features of the drilling rig include: precision engineered gearbox and non-dislodgement shaft system; compatibility with various earth drill drive units, and it can also be equipped with different hitches for mounting on most common excavators; enhanced control, allowing for controlled accurate drilling of holes several meters deep; interchangeable hitch and auger assemblies, eliminating the need to remove the cable from the rig; high-grade lift system, featuring high tensile galvanised steel winch cable with

spring tensioner assembly and easy access pulley grease point; and hose guide rail for neat hose connection.

In addition, Auger Torque offers its multipurpose mulcher for various applications, including ground clearance, tree and hedge trimming and removal, or just tackling over grown ditches. This attachment provides working widths of 1 m or 1.5 m, and can be used with 5- to 15-t excavators as well as skid steer loaders.

The mulcher is able to change its whole tooth drum quickly, instead of individual teeth (with tungsten, hammer and flail tooth options), saving a lot of time in the process. The unit is designed with a hinged cover to contain debris and enable easy access to the tooth drum.

The mulcher has a robust motor and also gearbox concealing the gears and bearings to prevent dust and dirt ingress. With solid heavy-duty steel construction, the unit is capable of handling the most rigorous mulching jobs. Its heavy-duty transmission belts are used to increase the service life by 15%, and its pressure and flow safety valve protects the motor from pressure spikes and excessive flow. ■

Website: www.augertorque.com.au



ABOVE AND LEFT: The mast-based drilling rig from Auger Torque is designed for accurate, quick and efficient drilling of large quantities of equal diameter holes. It is suitable for use with excavators between 12 and 15 t, with a torque range from 2,717 to 8,152 Nm.



The multipurpose mulcher attachment can be used with 5- to 15-t excavators as well as skid steer loaders.

Pile Dynamics introduces SHAPE for deep foundations

The Shaft Area Profile Evaluator (SHAPE) from Pile Dynamics, Inc (PDI) offers quality control of shaft radius, volume and verticality. It is a cost-effective quality assurance testing device used for deep foundations, such as drilled shafts, bored piles, slurry walls and barrettes, to better characterise the three-dimensional profile of these and other excavated deep foundation elements. It provides a fast, economical representation of the foundation excavation and verticality prior to placing concrete in wet conditions.

SHAPE's drilling stem advancement rate is approximately 1 ft/sec, giving simplicity in analysis with a clean signal and 3D profile views. It is a completely wireless device, requiring no electronic cabling from the surface to the device during operation, said PDI. This increases overall system reliability.

SHAPE automatically corrects for changes in wave speed with depth by measuring the wave speed at each measurement location along the length of the excavation, and adjusting the radius calculation based on the measured wave speed at any depth location.

In addition, SHAPE samples all eight sensors simultaneously at a high rate of speed, allowing it to be quickly deployed and construction to continue at a rapid rate. It can be operated on site or remotely with PDI's SiteLink technology. ■

Website: www.pile.com/shape



ABOVE AND LEFT: **SHAPE** is a quality assurance testing device used for deep foundations, such as drilled shafts, bored piles, slurry walls and barrettes, to better characterise the three-dimensional profile of these and other excavated deep foundation elements.

BELOW: **SHAPE** samples all eight sensors simultaneously at a high rate of speed, allowing it to be quickly deployed and construction to continue at a rapid rate. It can be operated on site or remotely with PDI's SiteLink technology.



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Cat 140 GC motorgrader for efficient job performance

The Cat 140 GC motorgrader is designed for high performance with low owning and operating costs. The Cat C7.1 engine, 6F/3R automatic powershift transmission (that eliminates the inching pedal), and precisely designed hydraulic system ensure the balanced performance of the machine in all operating situations.

An Eco operating mode and demand-fan reduce fuel consumption, and extended maintenance intervals further minimise operating costs. Operators of all skill levels can quickly achieve high production with the 140 GC, and options that include adjustable seats and efficient heating/cooling systems guarantee comfort.

With 45 years of refinement, the 140 GC's conventional steering wheel and lever controls are familiar to operators and ensure positive control. The control console adjusts to the operator's preference, and the powerful heating and cooling system option dehumidifies and pressurises the cab while circulating fresh air to seal out dust and keep windows clear. Seat upgrades include mechanical or air suspension; static seat is standard.

The 140 GC's standard no-spin differential activates with no operator input to increase traction in poor ground conditions, and to protect drivetrain components from damage. The optional Digital Blade Slope Meter takes the guesswork out of slope control and keeps the jobsite safer by eliminating manual grade checks. Cat Detect with Vision System (optional) uses a rearview camera to show a wide view behind the machine.

Other features of the 140 GC include: standard drawbar circle mouldboard that provides a long service life, with replaceable wear strips that maintain the system's integrity; oil-bath, multi-disc service brakes that are hydraulically-actuated for smooth, predictable braking and lower operating costs; and a variety of attachments, like scarifiers, rippers and front blades, which increase machine versatility.

There are also circle-drive slip clutch option that protects the pinion drive and circle teeth from potential damage; and circle saver option that reduces daily greasing requirements and protects the circle and pinion, significantly reducing the potential for damage.

In addition, optional guarding protects the 140 GC from damage in demanding applications, and optional secondary-steering system automatically activates if main pump pressure drops. ■

Website: www.cat.com



ABOVE AND BELOW: The Cat 140 GC motorgrader is designed for high performance with low owning and operating costs.



LEFT AND FAR LEFT: The Cat C7.1 engine, 6F/3R automatic powershift transmission (that eliminates the inching pedal), and precisely designed hydraulic system ensure the balanced performance of the machine in all operating situations.

Skyjack improves Elevate telematic solution

Skyjack has announced new developments to Elevate, its OEM-delivered telematics solution. The mobile-first solution was launched in 2018 and Skyjack has continued to work with its customers to ensure that Elevate identifies critical data points to help its customers create better processes. The company said it has spoken with service technicians and rental companies to identify the top service issues they see, and determine which data points could help them eliminate unnecessary service calls and maximise uptime.

The top issues identified by service technicians included: on-site battery management, battery management at the branch, and operator familiarity. Elevate's ready-to-operate indicator gives service technicians the ability to remotely see whether or not the operator has the controls configured properly to function the machine. This allows service technicians to resolve the most commonly seen issues without unnecessary onsite visits, reducing costs and improving customer experience.

In addition, Elevate On - a product within Elevate's digital suite of services - recently won an International Award for Powered Access (IAPA) for Innovative Technology. The app is designed for MEWP operators and their supervisors as an efficient way of guiding and tracking safety pre-checks and flagging maintenance items in advance. Elevate On streamlines processes and contributes to a safer jobsite.

According to Skyjack, the company is also working on a plan for Elevate to shift away from the map and move towards an analytic dashboard through Elevate Tiles. "It's a dashboard style analysis that gives Elevate customers an overview of their entire fleet's charge history, battery life percentage, and problematic charging behaviours," said the company.

Skyjack announced that its advanced battery management system that drives these insights will launch with updated Skycoded machines in 2019. ■

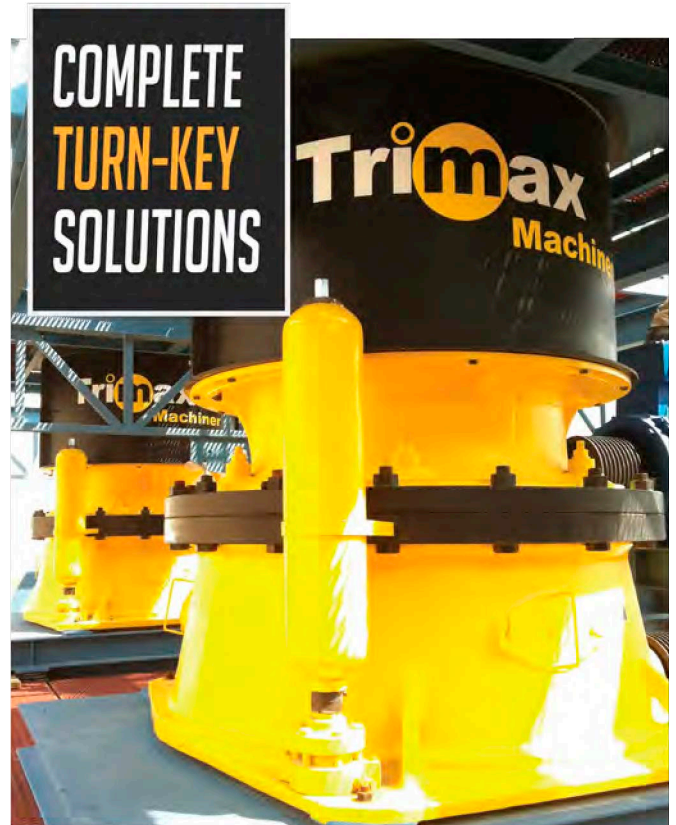
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Skyjack Elevate On is designed for MEWP operators and their supervisors as an efficient way of guiding and tracking safety pre-checks and flagging maintenance items in advance, contributing to a safer jobsite.



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Volvo EC200D excavator gains popularity in Indonesia

A growing middle class and rising levels of urbanisation has fuelled rapid residential real estate growth in Indonesia, according to research firm Oxford Business Group. Indonesian property developer PT Bumi Mapanget Asri is currently building a 300-ha housing complex in Manado, north Sulawesi, to meet the housing needs of over a thousand families in the city. To assist with this project, the company is relying on a Volvo EC200D crawler excavator to prepare the land for the first phase of construction.

With the challenging tropical conditions in Indonesia, PT Bumi Mapanget Asri said the EC200D could handle large workloads while remaining weatherproof. The machine has high load-bearing buckets, a powerful engine and an all-weather cab, making it capable of performing in harsh conditions.

For the past six months, PT Bumi Mapanget Asri has deployed the EC200D to carry out a wide range of tasks, including clearing debris, levelling the ground and moving materials to and from the site. Working up to 16 hours daily, the excavator is helping the company stay on track to meet its target of completing over a hundred houses annually.

PT Bumi Mapanget Asri revealed that the EC200D has brought a slew of productivity improvements to the job. The machine's low fuel consumption coupled with short cycle times and a large bucket capacity has helped the company reduce the costs on-site.

The EC200D is powered by a Volvo D5E Tier 3 engine that delivers 123 kW at 2,000 rpm. Coupled with compatible hydraulics, the machine is designed to operate quickly and with short cycle times. It is configured with a 5.7-m boom, 2.9-m arm and 0.8-cu m bucket, while its maximum breakout force is 116 kN.

PT Bumi Mapanget Asri bought the EC200D from a local dealer, Intraco Penta Prima Servis (IPPS), one of Volvo's two distribution partners in Indonesia. This machine was launched into Indonesia in the first quarter of 2018. With its flexibility to carry out a wide range of general construction tasks and excellent performance, the EC200D is proving especially popular in the country, with orders continuing to grow, said Volvo CE.

PT Bumi Mapanget Asri mentioned that one of its reasons to purchase the EC200D is the excellent aftermarket support offered by IPPS. "We have developed a close relationship with the dealer and are confident that they will fully support us with their expertise as we continue to use the machine for years to come," said the company.



TOP, MIDDLE AND ABOVE: Volvo EC200D helps Indonesian developer PT Bumi Mapanget Asri to build a 300-ha housing complex in Manado. The machine is currently preparing the land for the first phase of construction.



Volvo EC200D is also being used by contractor PT Berdikari Putra Perkasa to deliver building materials to projects around Yogyakarta.

In central Java, a Volvo EC200D is at work in Yogyakarta. The machine is helping contractor PT Berdikari Putra Perkasa to deliver building materials to projects around the local area. The company was one of the first in Indonesia to receive the Volvo EC200D excavator last year, which was intended to replace an older model.

The EC200D is based at the stockpile facility, playing an important role in operations where it works up to 20 hours a day moving over 300 cu m of sand and gravel from quarries to the stockpile. From here, the material is moved for processing before passing on to the construction projects where it will be used. Situated at an important bottleneck between extraction and transport, the excavator's job is vital for the successful delivery of aggregates to customers. ■

Website: www.volvoce.com



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GCP helps waterproof Auckland's Commercial Bay

The 57,000-sq-m Commercial Bay along the southern shore of the Waitemata harbour in Auckland, New Zealand, is set to be the largest mixed-use development in the city upon completion. Featuring a 39-storey office tower and 18,000 sq m of retail space, Commercial Bay connects to an underground rail station and is expected to transform the waterfront from an ageing mall into a hub for commerce, trade and transport.

With three basement levels more than 17 m deep, waterproofing the Commercial Bay project required a solution that would work in a wet and muddy environment while addressing the complex architectural design featuring detailed interfacing. At the same time, the solution had to form a permanent, continuous seal against water and a barrier to resist the stress of ground settlement.

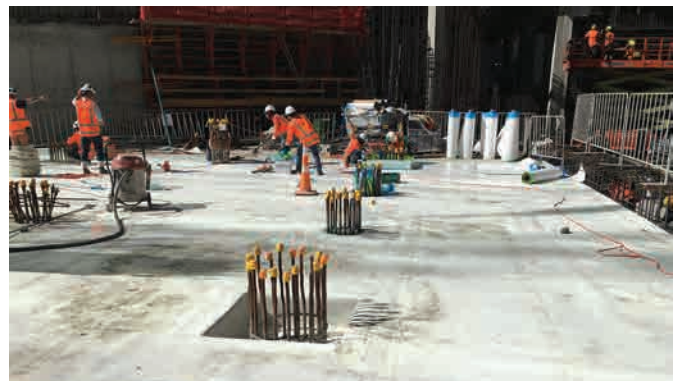
The new office tower was constructed among three existing buildings, making waterproofing a challenge due to the differential movement between buildings - which can damage the waterproofing if the design, or movement limiting structural designs, is not durable. Since the waterproofing application was scheduled to take place during the winter, with its heavy rainfall and high chance of mud contamination, the specifier wanted a solution that would be unaffected by the climate, and that would be fast and easy to install.

Simpson Gumpertz & Heger (SG&H), the structural design consultants on the Commercial Bay development, specified Preprufe Plus waterproofing membranes from GCP Applied Technologies. These membranes were selected to protect the project's basement and transport connection link. Sansom Construction Systems Ltd, a construction and engineering company, delivered the solution after consulting with the developer, Precinct Properties.

Designed with Advanced Bond Technology and dual adhesive Ziplap seams, the Preprufe Plus membranes form an integral bond to poured concrete. This integral bond provides a robust barrier to water, moisture and gas, and prevents both the ingress and lateral migration of water. Another benefit of Preprufe Plus is its absence of a release liner, which aids with efficient and reliable installation. The pre-applied waterproofing membrane can be trafficked immediately after application, and is ready for immediate placing of reinforcement. Its Ziplap seams allow for an adhesive-to-adhesive bond at membrane sheet overlaps and deliver excellent performance in harsh conditions, without the need for specialised equipment, heat or power.

On the Commercial Bay project, the Preprufe Plus membrane's easy roll and kick-out installation helped reduce installation time, unlike alternatives that require special heating equipment to weld laps together, or detailing tape to seal the laps. Adverse weather, mud contamination and delays to the construction schedule were major concerns for the developer, but since the Preprufe Plus membranes can be applied on damp surfaces, the development was able to meet a tight construction schedule. In addition, the ease of removing mud and water from the membranes' surfaces meant the contractor (Sansom Construction) did not have to worry about contamination issues.

GCP worked closely with SG&H during the design phase to identify 95% of structure's details, and to outline the installation methods prior to starting the project. Preprufe Plus membranes were applied to provide comparatively simple but positive detailing



ALL IMAGES: Preprufe Plus waterproofing membranes from GCP Applied Technologies have been selected for use in the Commercial Bay project in Auckland, New Zealand, to protect its basement and transport connection link.

on a multitude of piles, tiebacks, ground anchors and around penetrations. Furthermore, SG&H and GCP implemented strong quality assurance processes to ensure best practices and high installation quality. The robust waterproofing solution also helped rectify damages by other trades, such as during the installation of reinforcement, while maintaining waterproofing integrity. ■

Website: www.gcpat.com

Haulotte joins Beijing Daxing Int'l Airport project

Haulotte has recently delivered 16 machines to help with the construction of Beijing Daxing International Airport in China. Among them included two units of Haulotte HA20 LE electric articulating boom lift, which were reportedly chosen due to their eco-friendly features.

Scheduled to open in late 2019, Beijing Daxing International Airport is set to become the world's largest airport. It is said that environmental aspects are placed at the centre of this project. Thus, the Haulotte HA20 LE is considered an ideal solution as it fully satisfies the environmental protection requirements. This electric powered machine offers silent operation, indoors or outdoors on any surface, with no harmful emissions.

The oscillating axle and four-wheel drive of Haulotte HA20 LE provide optimal adherence and stability. Ultra-fast elevation speed, 360-degree continuous turret rotation and simultaneous movements improve productivity. Thanks to an optimal energy management, the HA20LE enables a full day's work in electric mode. An on-board range extender can rapidly recharge the high-capacity batteries while the machine remains operational.

In addition to the two electric articulating booms, Haulotte delivered four other articulating booms (HA12 IP, HA15 IP and HA41 RTJ Pro), two 55XA lightweight self-propelled booms, two Star 10 vertical masts, and six Compact 14 scissor lifts. ■

Website: www.haulotte.com



ALL IMAGES: Haulotte has delivered 16 machines for the construction of Beijing Daxing International Airport, including six articulating booms (two of which are electric models), two lightweight self-propelled booms, two vertical masts and six scissor lifts.



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WOMEN IN LEADERSHIP

STRENGTHENING ITS COMMITMENT TO A DIVERSE AND INCLUSIVE WORKFORCE, CATERPILLAR RECENTLY ORGANISED ITS FIRST WOMEN'S INITIATIVE NETWORK (WIN) APAC SUMMIT IN SINGAPORE. THE EVENT SERVED AS A PLATFORM FOR SHARING BEST PRACTICES AMONG COMPANIES IN THE ASIA PACIFIC REGION - ESPECIALLY IN INDUSTRIES LIKE ENGINEERING AND CONSTRUCTION - FOCUSING ON HOW DIVERSITY AND INCLUSION, EQUAL REPRESENTATION, AND WOMEN IN LEADERSHIP CAN HELP DELIVER BETTER BUSINESS RESULTS.

With the theme of 'Think Equal, Build Smart, and Innovate for Change', the inaugural Caterpillar WIN APAC Summit took place in March 2019. It was attended by both men and women from across Asia Pacific including business, academia and government leaders. These also comprised a large number of women in the engineering, construction, mining, and oil & gas industries such as Denise Johnson, Caterpillar's group president responsible for Resources Industries; Juliet Taylor, account management and supply manager at BHP; Meena Chatuverdi, joint managing director at Gainwell; and Helen Lim, global specialties customer operations manager at Shell.

"This first WIN Summit in Asia is really important to us," said Ms Johnson, speaking to Southeast Asia Construction. "With such a diverse culture in the region, the challenges we face are also varied. Therefore, having a discussion and setting some expectations of improvement is what we're trying to achieve through the summit."



ABOVE AND BELOW: The summit highlighted how diversity and inclusion, equal representation, and women in leadership can deliver better results for businesses.



LEFT: Denise Johnson, Caterpillar's group president responsible for Resources Industries, spoke at the summit.

BELOW: Juliet Taylor, account management and supply manager at BHP (on the left), also shared some of the company's practices.



Both images © Caterpillar

Greater business results

"We recognise there is a connection between increased diversity and inclusion and driving business results, so it is an essential issue that we will continue to focus on," highlighted Ms Johnson. "While there are several focus areas within our diversity and inclusion strategy, gender is the one diversity topic that is globally applicable. Increasing access for women to leadership positions has potential for tangible impact on our organisation's ability to excel in an increasingly dynamic global business environment."

A recent McKinsey Global Institute Study indicates US\$4.5 trillion of additional annual GDP in 2025 could be added to the economies of Asia Pacific by advancing women's equality. That growth would represent a 12% increase on current GDP projections for 2025.

Caterpillar's commitment to driving business results through an inclusive and diverse workforce was recognised in January 2019, when the company was named on the Forbes List of Best Employers for Diversity 2019. Currently, 20% of Caterpillar's global workforce is composed of women, and 20% of the company's leaders are women. "Our goal is to increase these numbers to 29% and 25% respectively by 2022, which are the industry benchmarks," revealed Ms Johnson.

Summit attendees also discussed the important role men play in advancing diversity and inclusion. At Caterpillar, male leaders across the organisation have firmly supported the work.

“Men play an important role in making Caterpillar a more diverse and inclusive workplace. In 2016, Breakthrough Leadership - Men as Allies was created as a grass roots initiative to develop and promote a more gender inclusive culture at Caterpillar. It is the first programme of its kind to talk specifically about actions and behaviours that disadvantage and disengage a minority population of our teams,” explained Raymond Chan, Caterpillar’s vice president responsible for Asia Pacific Distribution. “In the past few years, such courses have been held in 14 different locations in the Asia Pacific region. This WIN APAC Summit is a continuation of our efforts in promoting a more gender inclusive culture that drives high engagement and builds high-performing team.”

“Both men and women have to work together - as one team – to drive the diversity initiative,” stressed Ms Johnson.

Caterpillar is joined by other global leaders in the focus on diversity and inclusion. Among them is BHP, a world-leading resources company and one of Caterpillar’s important customers in Asia and worldwide. At the summit, Ms Taylor shared a few of the company’s practices.

“For BHP, our suppliers are central to our aspirational goal of achieving gender balance in our workforce by 2025. We are proud to support Caterpillar on this important regional event as we work to progress our shared vision for inclusion and diversity,” she said.

Developing qualified women

Caterpillar WIN Chapter was set up in 2006, with the objective of developing women to act as catalysts for local and global change. It also aims to build on strength of women to create empowered connections across Caterpillar, driving personal and professional growth. For example, the WIN Chapter in Singapore designed a cross company mentoring programme to create opportunities for female employees to communicate with senior leaders from other organisations to broaden their views. Topics like unconscious bias, breakthrough leadership and harnessing the power of networking are widely discussed. By collaborating with Cat dealers and customers, STEM (Science, Technology, Engineering and Mathematics) activities are also being offered to school students.



ABOVE: The inaugural Caterpillar WIN APAC Summit drew both men and women from across Asia Pacific, including business, academia and government leaders.

FAR LEFT AND LEFT: Caterpillar also presented several awards to its female and male employees in Asia Pacific, who have made a difference in the area of diversity and inclusion, equal representation, and women in leadership.

“Part of our responsibility is to develop our female talent internally to ensure that they are ready to take on their role, particularly when it comes to leadership positions,” said Ms Johnson.

“It’s really important that we find women who are qualified for the job - not just to fill the job. In the end, it’s not about quota.”

Women in construction

Sharing her experiences with Southeast Asia Construction, Ms Johnson further described a major shift in the engineering and construction industry, which is traditionally viewed as ‘a man’s world’.

“In the past there were not many career options for female employees, except for support roles – like HR or finance. Today, you have women in various capacities – as an engineer, machine operator, sales executive and others. They now undertake a lot more complexities in their role, compared to before.

“As an OEM, we need to keep educating the general public that there is a broad spectrum of positions available for women in the industry, as well as a viable career progression. In fact, some of our most effective machine operators and sales executives are women.”

In addition to bringing this awareness,

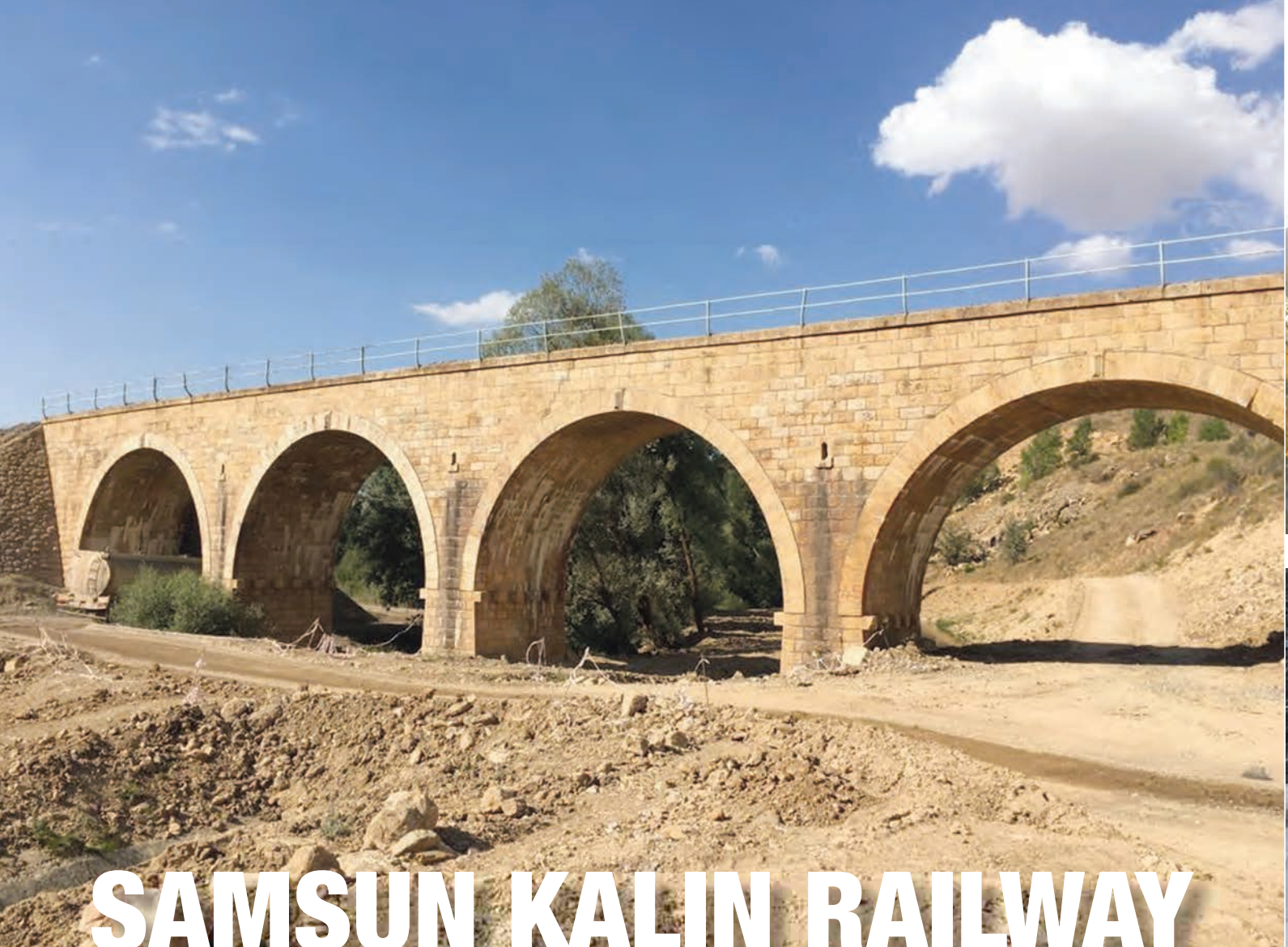
Ms Johnson pointed out that companies need to establish a welcoming environment for women. “It is another challenge we try to overcome,” she admitted. “If women can see they have a role to play, great career with good salary and benefits, and opportunities to make a difference, the industry would be more appealing to them.

“Offering alternatives for female employees, like job sharing or flexible work arrangement to help them cope with family demand, could also make it attractive.”

Ms Johnson emphasised that in order to attract women successfully, companies should “actively recruit women - instead of relying on them to find us - using a variety of methods such as social media, university recruitment programmes, job referrals, etc. And once they are hired, we have to be more intentional about the development we provide for them - what job are we going to rotate them through, how do we develop them - so that we have a diverse, qualified female talent pool.”

She summed it up, “There is a huge opportunity for women in the engineering and construction industry, with an enormous potential for both personal and professional development. The sky is the limit as far as their career can go!” ■

Website: www.caterpillar.com



SAMSUN KALIN RAILWAY



TOP AND ABOVE: The Samsun-Kalin railway in Turkey features a 378-km-long single track, unelectrified line connecting Samsun (on the Black Sea) to the national railway network.

The Samsun-Kalin railway renewal project in Turkey involved the modernisation of a 378-km-long single track, unelectrified line connecting Samsun (on the Black Sea) to the national railway network. It was commissioned under a design-and-build contract, and the appointed contractor was Çelikler-Gülermak-AZD joint venture.

The project started in 2015 and was completed in 2018, with a total cost of €259 million. The €220 million was financed by the European Union - as part of the Transport Operational Programme - while the €39 million came from the Turkish government.

Structural strengthening works

In addition to modernisation of the railway line, the project also required restoration and structural strengthening works on 40 bridges - which had been built during the first decades of the 20th century.

Here, numerous Mapei products were used. Among them was Mape-Antique I-15, which was injected into masonry walls for reinforcement works. This system



The article courtesy of Realta Mapei International no. 74



ABOVE LEFT, ABOVE, FAR LEFT AND LEFT: **Various Mapei systems** were used in the project during restoration and structural strengthening works on 40 bridges, which are protected as historical heritage.

is a cement-free, fillerized hydraulic binder in powder form, based on lime and Eco-Pozzolan, natural ultra-fine sand and special admixtures for making highly fluid injection slurry. The properties of the hardened slurry made using Mape-Antique I-15, such as mechanical strength, modulus of elasticity and porosity, are very similar to those of mortars made using lime, lime-pozzolan or hydraulic lime originally used in the construction of old buildings.

Mape-Antique Ecolastic was also applied to waterproof masonry after it had been strengthened with Mape-Antique Strutturale NHL, Mapenet EM 30, Mapenet EM Connector and Mapefix PE Wall.

Mape-Antique Ecolastic is a two-component, elastic, salt-resistant, cement-free, lime and Eco-Pozzolan based coating for waterproofing and protecting construction elements. It is suitable for irregular shaped surfaces, brick vaulted roofs, screeds, roofs, storage tanks, fountains and features (such as cornices, skirt roofs and small columns) on existing structures, including buildings with a National Heritage protection order and listed buildings.

Other Mapei products on the project included Mape-Antique LC, mixed with locally-sourced aggregates to make renders and masonry mortars; Mapefer 1K to protect reinforcing rods against corrosion; Mapegrout Thixotropic to repair various concrete elements and features; and Mapelastic Smart to waterproof the surface of concrete. ■

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The Precious Jewel

The much-anticipated Jewel Changi Airport - widely known as Jewel - has finally opened to the public. This new landmark in Singapore features a distinctive dome-shaped facade made of glass and steel.

The 135,700 sq m complex is a one-stop solution. It provides a range of facilities, including indoor gardens and leisure attractions, retail and dining offerings, as well as a hotel and airport services - all under one roof.

The project has drawn many praises and received several awards for its innovative design - but behind the bling and glamour of Jewel is a creative team that had to overcome massive challenges in building such an architectural icon.

Built on the site of the former Terminal 1 open-air carpark, the S\$1.7 billion development with a site area of 38,500 sq m features five storeys above ground and five basement storeys. It can be accessed easily from Terminal 1, as well as Terminal 2 and 3 via pedestrian bridges.

One of the highlights of Jewel is the HSBC Rain Vortex. At 40 m high, it is the world's tallest indoor waterfall. More than 10,000 gallons of water reportedly flows through the oculus per minute at peak conditions.

The Shiseido Forest Valley is another highlight, which is one of Singapore's largest climate-controlled indoor gardens that has more than 120 species of plants. This four-storey terraced garden offers walking trails, cascading waterfalls and seating areas.

The Canopy Park is located at the topmost level of Jewel (fifth level), covering 14,000 sq m of attractions and dining outlets integrated within the garden spaces. The iconic play attractions include the Manulife Sky Nets, Hedge and Mirror Mazes and Discovery Slides.

In addition, the 50-m-long Canopy Bridge is suspended 23 m above ground, connecting the two F&B zones and the top level of Jewel. It provides a view to the Rain Vortex and Forest Valley.

Construction of Jewel broke ground in December 2014, and the development was officially opened on 17 April 2019. For its innovative design, Jewel has been accorded multiple local and international awards including the MAPIC Award for Best Futura Shopping Centre, MIPIM Asia Award for Best Future Project, the



© Jewel Changi Airport Devt



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BCA Green Mark Award - GoldPLUS award, the BCA Universal Design (UD) Mark Design GoldPLUS award and the International Architecture Award for Best New Architecture.

In conjunction with the development of Jewel, Changi Airport's Terminal 1 has also been expanded to increase its capacity by another three million passenger movements per year - bringing its total capacity to 85 million. The project started in March 2015, and is scheduled for completion this year.

Design vision

The developer of Jewel, Jewel Changi Airport Development - a joint venture between Changi Airport Group and CapitaLand - selected a consortium led by Safdie Architects, helmed by Moshe Safdie, to design the project.

The consortium partners - RSP Architects Planners & Engineers, BuroHappold Engineering, Lighting Planner Associates and Benoy - lent their expertise on other aspects of Jewel's design, including the facade, lighting and interior design.

OPPOSITE PAGE: View of the Shiseido Forest Valley and the HSBC Rain Vortex from Changi Airport Terminal 1. The 40-m Rain Vortex is the world's tallest indoor waterfall.

TOP: The skytrain between Terminal 2 and Terminal 3 passes by the waterfall.

ABOVE: Topiary Walk at Canopy Park is one of Jewel's attractions. It features creative topiary art in the shape of life-size animals.

ABOVE LEFT: Featuring a distinctive dome-shaped facade made of glass and steel, Jewel has been accorded multiple local and international awards for its innovative design.

"The Jewel toroidal inverse dome creates a new kind of spatial experience, a daylit vast landscaped garden, combined with seven levels of shopping and airport facilities. Light penetrates everywhere, while the roof drains through the dome to create a



dramatic waterfall, dropping seven storeys to the lowest building level,” described Moshe Safdie, principal of Safdie Architects. “As an integrated whole it creates a new typology – transforming the airport’s principal function as a transit hub into that of an interactive civic and urban centre.

“Nowhere in the world has a building been constructed that integrates the public realm with an airport facility so closely. Entirely publicly accessible, the glass-enclosed toroidal building asserts a new model for airports as a destination for community activity, entertainment and shopping.”

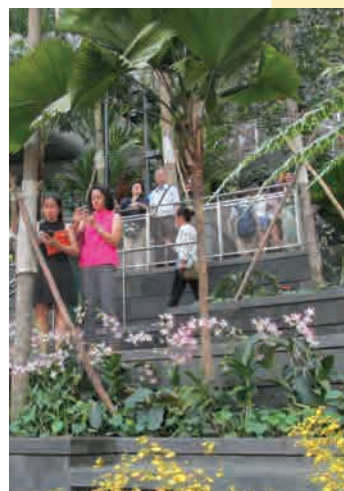
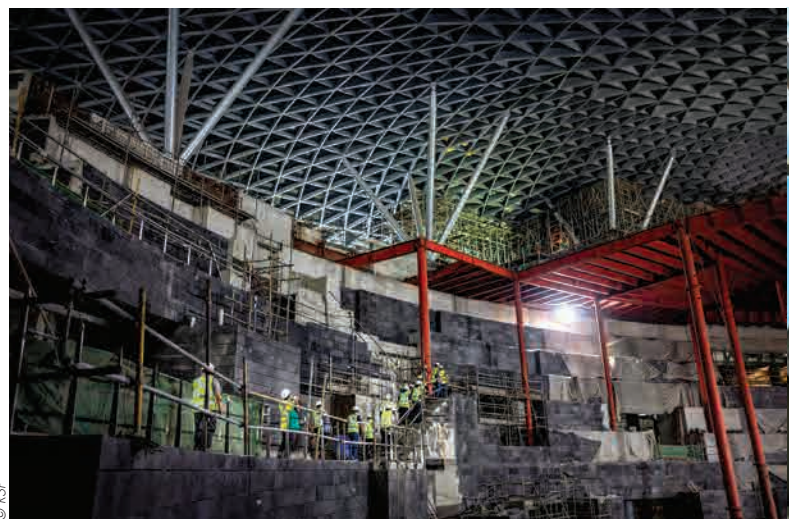
Dome-shaped facade

A major challenge on the project was the construction of the dome-shaped facade, explained Chris Tan, director at RSP Architects Planners & Engineers (RSP). More than 9,000 glass panels, about 18,000 steel beams and over 6,000 steel nodes (to encase the junction of the steel beams and glass panels) were used to build the facade.

RSP highlighted that each piece of glass panel, weighing 250-300 kg, is different in size and was customised to fit into a specific grid. It is made of high-performance, triple Low-E architectural glass material that has the dual ability to transmit light and reduce heat.

“The specifications of the glass panels were carefully selected due to Jewel’s proximity to the Changi Airport’s aerodrome. Each of them has been cut with precision, giving it a 16-mm air gap to insulate against noise emitted from the aircrafts,” said Ms Tan. She was one of the core members in the architecture team handling the Jewel project.

It is said that every piece of steel node was also customised. They were manufactured using Computer Aided Design and Manufacturing (CAD/CAM) applications from steel bars to achieve the highest level of accuracy and prevent distortion caused by welding during installation.



TOP AND ABOVE: **The Forest Valley under construction.** It is one of Singapore’s largest climate-controlled indoor gardens, which has more than 120 species of plants.

LEFT: **The four-storey Forest Valley offers walking trails, cascading waterfalls, and seating areas.**



The facade installation called for meticulous coordination to ensure that each glass panel was fitted into the 'grid' that it had been designed for. The process started from the oculus (opening of the Rain Vortex in the roof) outwards, towards the edge of the Gateway Gardens.

In addition, a series of tests and research were conducted to ensure that the glare emitted off the glass surface will not interfere with the daily operations of air traffic controllers as well as aircrafts that are approaching the two runways at Changi Airport.

"Due to such complexity, the installation of the facade took approximately one year to complete," said Ms Tan. "Having the roof directly above Level 5 means there is no space for air-conditioning duct works to run without being exposed. Air-conditioning ventilation is achieved through the use of chilled slabs, floor diffuser along the main walkway, side vents along

TOP, ABOVE AND ABOVE LEFT: The installation of the dome-shaped facade posed a major challenge to the project team. It required more than 9,000 glass panels, about 18,000 steel beams and over 6,000 steel nodes.

the periphery, and seats integrated with air diffuser to provide cooling."

The 23,410 sq m dome-shaped facade, which weighs more than 6,000 t (equivalent to 10 Airbus A380 planes), is supported by a ring of 14 x 12-m-high tree-like columns and a ring beam at the edge of the structure. This allows the four-storey Forest Valley and the 14,000 sq m Canopy Park at the top floor to be column free.

3D modelling

“Building Information Modelling (BIM) was a significant tool in the conceptual, design development and construction stages of Jewel,” shared Ms Tan. The conceptual form for the glass dome was conceived from the ground up using BIM from the onset. The entire design development and detailed shopdrawing review processes were BIM-based as well.

BIM was also used to verify that construction cranes would not obscure views from the control tower to the airport runways, before they were being erected. Moreover, BIM was applied in the maintenance strategy and to assess operational impact items such as traffic planning and sightline impact of construction cranes to the control tower.

The project team added that BIM Execution Plan (BEP) was outlined at the start of the project, setting out the roadmap for BIM usage for the project. The contractor’s compliance with the BEP was reviewed at regular intervals by Gehry Technologies to ascertain and guide the progress along the roadmap.



TOP AND ABOVE: More than 10,000 gallons of water reportedly flows through the oculus per minute at peak conditions.



The retail and dining area at Jewel.



Jewel offers an early check-in facility for flights and baggage storage service, making it more convenient for passengers.



LEFT: Chris Tan, director at RSP, was one of the core members in the architecture team handling the Jewel project.

BELOW: The 50-m-long Canopy Bridge is suspended 23 m above ground, connecting the two F&B zones and the top level of Jewel.



Strict schedule

RSP further mentioned that the construction of Jewel took place while the airport was in operation. It impacted Terminal 1 operations as well as external road network in the vicinity of Jewel. Because of this, the completion of the project occurred in 15 separate phases to minimise disruption to existing airport operations.

One of the difficulties was the construction of Forest Valley, said Ms Tan. "The design of the Forest Valley is quite complex, and it required careful planning and coordination in sequencing the construction of the terraced planters and hoisting of the various trees and plants, before the chilled slab and stone flooring were completed to give it the finished look."

"But what's important is that, despite all the massive challenges we faced, Jewel was completed on time and within the budget!" she smiled, celebrating the achievement by the project team. ■

THE MAKING OF JEWEL FACADE

- More than 9,000 glass panels. Each is different in size and was custom-made to fit into a specific grid. Each weighs 250-300 kg and has the dual ability to transmit light and reduce heat.
- About 18,000 steel beams.
- Over 6,000 steel nodes. Each is different and was custom-made.
- The facade weighs more than 6,000 t, equivalent to 10 Airbus A380 planes.

PROJECT TEAM

Developer: Jewel Changi Airport Development (a joint venture between Changi Airport Group and CapitaLand)

Design Consultant: Safdie Architects

Architect: RSP Architects Planners & Engineers

Civil & Structural Engineer: RSP Architects Planners & Engineers

Building Structure and Facades: BuroHappold Engineering

Main Contractor: Woh Hup - Obayashi Joint Venture

Specialist Contractor: Mero Asia Pacific

Mechanical & Electrical Engineer: Mott Macdonald Singapore

Quantity Surveyor: Arcadis Singapore

Environmental Design Consultant: Atelier Ten

Landscape Architect: PWP Landscape Architecture

Executive Landscape Architect: ICN Design International

Interior Designer: Benoy

Water Feature: WET Design

Lighting Designer: Lighting Planners Associates

Signage/Wayfinding: Pentagram & Entro Communications

HAULOTTE goes electric



WITH SUSTAINABILITY NOW AT THE CORE OF MANY EQUIPMENT MANUFACTURERS IN THE CONSTRUCTION INDUSTRY, HAULOTTE OFFERS ITS NEW ELECTRIC ARTICULATING BOOM LIFTS - THE PULSEO GENERATION - TO MEET THIS REQUIREMENT.

The electric HA20 LE and HA20 LE Pro are the first models in the Pulseo generation, offering lower energy costs as well as reduced air and noise pollution. They are suitable for use in public areas such as shopping centres, airports, concert halls, pedestrian streets, etc, and also in other places 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 series 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.

The machines' fast elevation speed, 360-degree continuous turret rotation and simultaneous movements work together to enhance productivity. Dual-load models make it possible to increase the load capacity while adapting the working envelope, leading to stability.

The Pulseo machines offer 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 available 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



The Pulseo product line is also suitable for indoor use.

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 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 Haulotte Diag app.

Since its launch last year, the Pulseo generation has received a number of recognitions and awards from many industry associations, such as the French Construction Industry, European Rental Association and China Construction Machinery TOP 50, among others.

The electric HA20 LE Pro was recently being showcased at the Haulotte Open Day in Singapore, which was held in April at the company's facility. Attended by customers from across the country, the event displayed a wide range of machines from Haulotte. It also provided education and hands-on machine demonstrations, as well as an overview of Haulotte innovations, spare parts promotions, services, plus tips on how to extend the lifetime of a fleet. ■

Website: www.haulotte.sg



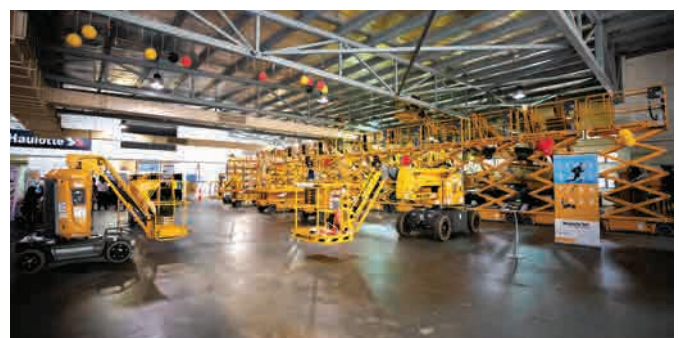
With its oscillating axle and four-wheel drive, the Pulseo range delivers excellent performance and stability for outdoor applications.



ABOVE AND BELOW: The Pulseo generation being showcased at the Haulotte Open Day in Singapore. During the event, customers had the opportunity to get hands-on experience on the HA20 LE Pro.



ABOVE AND RIGHT: Haulotte displayed a wide range of machines at its Open Day, which was attended by customers from across the country.





bauma sets another record

b auma 2019 closed successfully, attracting 620,000 visitors from more than 200 countries plus 3,700 exhibitors from 63 countries - on an exhibition area of 614,000 sq m. This is the best result in the show's 65-year history, said the organiser Messe München.

The number of visitors rose significantly compared with the previous edition (2016: 583,736), so did the number of exhibitors (2016: 3,425) and the size of exhibition space (2016: 605,000 sq m).

At bauma 2019, more than 250,000 visitors came from countries outside of Germany. The top 10 visitor countries (after Germany) were: Austria, Italy, Switzerland, France, the Netherlands, Russia, Sweden, the Czech Republic, Poland and Great Britain.

The show also experienced a strong increase in attendance from overseas visitors, especially from China, Australia and Japan, according to Messe München. More than 5,500 visitors came from China alone.

"We had visitors from all over the world – North America, South America, Africa, Asia, Australia and Europe," said Toni Koitmaa, product director at Elematic, the Finnish manufacturer of precast concrete production technologies and an exhibitor. "bauma is the most important and biggest fair in this business. We are very satisfied with the trade fair results."

German TBM manufacturer Herrenknecht was another satisfied exhibitor. "Every bauma is something special - but 2019 topped everything for Herrenknecht. The quality and quantity of decision makers from our target groups were exceptional, and the response from our customers was tremendous. The exhibition never has been so global for us," said Dr. -Ing. E.h.



TOP, MIDDLE AND ABOVE: **bauma 2019** attracted 620,000 visitors from more than 200 countries, plus 3,700 exhibitors from 63 countries.

All images © Messe München



All images © Messe München

TOP, MIDDLE AND ABOVE: **The outdoor area.**

TOP, MIDDLE AND ABOVE: **The indoor area.**

Martin Herrenknecht, chairman of the board of management at Herrenknecht.

The focus of this year's bauma was sustainable and digital solutions – which are widely known as the 'megatrend' in the construction machinery industry. Sensors and communication interfaces that collect and analyse data have become standard equipment. Many machines and vehicles are also becoming cleaner, quieter and more efficient, as evidenced by the number of electric and hybrid drive systems displayed at the show.

Austrian formwork manufacturer Doka was one of the exhibitors that presented digital innovations. "The Doka Campus enabled us to showcase all of our innovative theme worlds. We were pleasantly surprised above all by the visitors' enthusiasm for our digital offerings, which can support productivity on their

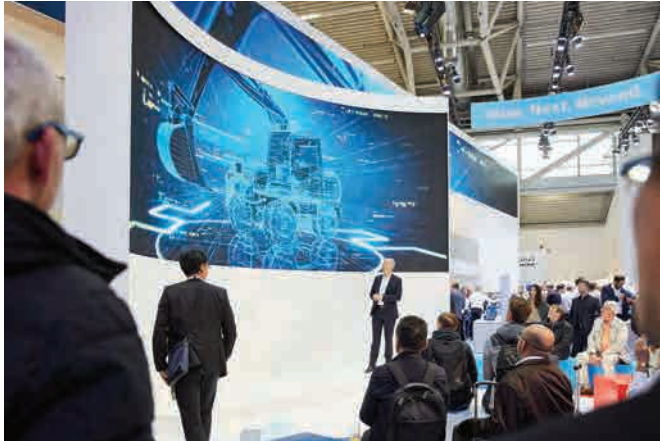
construction sites in the future," said Harald Ziebula, chairman of the executive board of Doka. "bauma 2019 was a complete success for us, our national and international customers as well as potential customers."

The visit by high-ranking political leaders further underscored the importance of bauma. The show's partner country, Canada, was represented in part by Stéphane Dion, the ambassador and former Minister of Foreign Affairs, and Jonatan Julien, the Minister of Energy and Natural Resources of the Bavarian partner province Quebec. The Chinese delegation was led by Wang Bingnan, China's Vice Minister of Commerce.

"This trade fair is a showcase for Germany," stressed Peter Altmaier, German Minister for Economic Affairs and Energy, speaking at the opening of bauma.



All images © Messe München

TOP AND ABOVE: **Machine demonstrations.**TOP, MIDDLE AND ABOVE: **Digital and sustainable solutions were the main topics at bauma 2019.**

“For me as a private individual, a visit to bauma has always been a highlight in my life,” added Dr. Markus Söder, Bavarian Minister President.

Hubert Aiwanger, Bavarian State Minister For Economic Affairs, State Development and Energy, and Deputy Minister President, also took an extended tour of the show.

Major industry associations participated at bauma 2019 as well. “bauma is the place to be; the place where every three years our sector meets to present the latest technologies and innovations,” said Jorge Cuartero, managing director of Anmopyc, the Spanish Manufacturers’ Association of Construction, Public Works and Mining Equipment. “This year has been the biggest bauma ever. It was a tremendous success for us since we have got the opportunity to meet with people from all continents.”

Joachim Schmid, managing director of the Construction Machinery and Building Material Association of the German Engineering Federation, echoed the same sentiment. “Conversations with exhibitors showed that many trade fair exhibitors had a specific interest in buying when they dropped by company booths, something that fuels hopes for continuing economic stability. We saw once again that the innovation cycle revolves around bauma’s three-year schedule.”

bauma Innovation Awards

Winners of the bauma Innovation Award 2019 have been announced in five categories, including:

- E-Power Pipe, Herrenknecht AG (Category 1: Machine)
- Pave-TM layer thickness measuring system, Moba Mobile Automation AG (Category 2: Components/Digital Systems)
- Worldwide. Mobile manufacturing, Max Bögl Stiftung & Co KG (Category 3: Construction Work/Construction Method/Construction Process)
- Driver guidance 4.0, Technical University of Munich, Chair of Material Flow and Logistics (Category 4: Science/Research)
- Intusi intuitive user interface, Liebherr-Hydraulikbagger GmbH (Category 5: Design)

A total of 138 nominations were submitted from Germany and abroad, and 15 nominees were selected in January 2019 in Munich. The competition is a joint initiative between bauma and several organisations, including the German Engineering Federation (VDMA), German Construction Industry Association (HDB), Central Association of the German Construction Industry (ZDB), and German Building Materials Association (BBS).



ALL IMAGES ON THIS PAGE: Exhibitors used bauma as an opportunity to celebrate their collaborations with global partners.

Celebrating global partnerships

Many exhibitors used bauma as a golden opportunity to celebrate their collaborations with global partners, as well as to organise handover ceremony events for their customers who hailed from all over the world.

Manitowoc Cranes held a special ceremony to celebrate its long-term partnership with Korea International Ltd (KIL) - which has been South Korea's sole Potain tower crane distributor since 1975. Manitowoc also organised a customer recognition ceremony to celebrate its collaboration with another Korean company, Shinwoo Development Co.

On the opening day of bauma, Liebherr handed over the key for a brand new HS 8070 duty cycle crawler crane to its first customer

at the show, the Spanish family-run company Cimentaciones Abando. A number of handover ceremonies also took place at the XCMG and Kobelco booths.

Terex Cranes booth was full of activities with special celebrations as well. The company's distributor in Singapore - Mobile Cranes Asia - came to bauma and made an order for a new Demag AC 350-6 all terrain crane. In addition, Indian companies Modern Crane Service and A. Ladha of York Cranes, each purchased a Demag AC 250-5 all terrain crane.

The next bauma is scheduled to take place from 4 to 10 April 2022, once again at the Messe München Exhibition Centre in Munich, Germany. ■

Website: www.bauma.de

The following pages cover some of the exhibitors and their innovations that were showcased at bauma 2019.

TEREX TRUCKS

The largest model from Terex Trucks, the TA400, is built to perform in some of the most challenging applications. With a maximum payload of 38 t and heaped capacity of 23 cu m, the machine is powered by a Scania DC13 engine that develops gross power of 331 kW and a maximum torque of 2,255 Nm. The engine is globally emissions compliant and meets the requirements of EU and North American legislation without the need for a diesel particulate filter (DPF).

The TA400's drivetrain is perfectly matched to the engine, thanks to automatic adaptive shifting capabilities and a pre-selected two-speed transfer box, along with longitudinal and limited slip transverse differential locks. All of this helps the machine to deliver improvements in performance and productivity, whatever the application.

Other highlights of the TA400 include great traction and an effective power-to-weight ratio, which ensure materials can be moved as quickly as possible in all conditions. Reducing operational costs even further, as well as enhancing safety, is the force-cooled multi-disc brakes. Supported by an electronically activated exhaust brake and a six-stage modulating transmission retarder, the TA400 benefits from longer brake component lifecycles. The Allison HD4560 transmission boasts high performance oil and up to 6,000 hours between service intervals.

The TA400 also has magnetic suction filters, which reduce the risk of contaminants entering the hydraulic system. This can maximise uptime through cleaner hydraulic oil, longer periods between maintenance and prolonged hydraulic component lifecycles.

The TA400 features a spacious, ergonomically designed cab with pressurised properties. Acoustic insulation helps to minimise noise levels inside the cab, while the heating, ventilation and air conditioning (HVAC) system ensures a stable temperature. There are also a tilt/telescopic steering wheel, an adaptive air suspension operator's seat with adjustable armrests, anti-vibration mounts for the engine and cab, and cushioned stops on the steering cylinders.

For safe and easy servicing, the TA400 has ground level test points, a fully tilting cab, an electronically raised hood and a full suite of on-dash diagnostic and machine health check readouts that help to maximise uptime. ■

Website: www.terextrucks.com



TA400 articulated hauler.

ASTEC INDUSTRIES

Johnson Crushers International, a company of Astec Industries, has expanded its Kodiak Plus cone crusher series with the new K350+. This mid-range model offers higher production with a smaller footprint.

In comparison to the K300+, the K350+ features increases in drive train, stroke, horsepower, weight, head diameter and hold-down force, resulting in an up to 10% capacity increase. With the same bolt pattern, the new cone can be mounted in most current K300+ applications.

Like other cones in the Kodiak Plus cone crusher series, the K350+ features an industry-leading tramp iron relief system, fully-protected internal counterweights, precision roller bearing design, patented liner retention system and 360° thread locking ring for consistent product quality.

In addition, Kolberg-Pioneer - also part of Astec Industries - has expanded its sand processing plant line to include the new 9201 model. This system is designed to dewater and fine-tune sand to a level not typically possible with traditional sand-dewatering equipment, while also using less water. The custom-built system is available in portable, semi-portable and stationary configurations with various types and quantities of cyclones, pumps and dewatering screen sizes. ■

Website: www.kpijci.com



ABOVE:
Kodiak Plus
K350+ cone
crusher.

LEFT:
Kolberg-
Pioneer
9201 sand
processing
plant.

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GOLDHOFER

The ADDrive 2.0 heavy-duty module from Goldhofer can be used in both self-propelled and towed modes. With an axle load of 6 x 36.1 t, the vehicle has a loading height of 1,175 mm, loading length of 9,000 mm and loading platform width of 3,000 mm. Its payload is approximately 191.1 t.

Compared with the previous generation, the power of the ADDrive 2.0 has been almost doubled to 530 hp. The vehicle has a tractive power of 504 kN and delivers speeds of up to 50 km/hr in the ADD mode.

The ADDrive incorporates an electronic braking system, which also functions in combination with ABS modules to help provide maximum safety. When the vehicle is not in the self-propelled but towed mode, there is no oil flow within the hydro-mechanical drive system, thus preventing overheating in the drive unit and minimising wear.

The ADDrive can be easily installed in trailer and semi-trailer combinations and can also be combined with drop decks and long-load turntables. Modules can be coupled together to form longitudinal and parallel combinations and synchronised with other Goldhofer ADDrive modules.

Other highlights from Goldhofer at bauma included the PST with Speedrive function, Arcus PK, and the company's intelligent solutions for transporting wind turbine blades, Venum in combination with Bladex and the FTV 500. Visitors also had the chance to see the study for an electronic steering system featured on the STZ-L 4. This system guarantees an optimum steering angle in every situation, taking full account of the weight, dimensions, position and length of the load. The result is a steering performance that ensures maximum manoeuvrability of the low-loader. ■

Website: www.goldhofer.de



Goldhofer ADDrive 2.0 transporting a heavy load (above), and Venum in combination with Bladex carrying a wind turbine blade.



JLG

JLG launched its full electric range of construction booms, available in three models – 340AJ, 450AJ and 520AJ. They are equipped with lithium batteries, offering working heights from 12 to 18 m and an unrestricted platform capacity of 250 kg. These electric booms deliver similar lift speeds and platform capacities as their conventional diesel counterparts, said JLG. Featuring two-wheel drive, they have good terrain capability in semi-rough terrain.

The JLG light weight electric scissor lifts also made their appearance, previously displayed at bauma China 2018. They feature dual front-wheel drive electric engines, providing better endurance and performance. The front wheel steering system enables a zero turning radius, not only ensuring that the platforms meet the requirements of narrow space in constructions and improving platform manoeuvrability, but also enabling the equipment to fit in freight elevators.

JLG also announced its HC3 high capacity boom product range, offering an excellent basket outreach and capacity. Load sensing will automatically adjust the work envelope, allowing for the maximum work envelope or a restricted version. The LED display in the platform indicates operators which load chart is operated. All of JLG diesel-powered booms (with some exceptions) that are equipped with this feature will be able to carry three people and tools up to 454 kg in a restricted work envelope. Reducing the platform load to three people and tools up to 340 kg extends the work envelope. The full and unrestricted envelope can be operated when the load remains below 300 kg (three people and tools).

According to JLG, its high capacity booms will be introduced at the end of 2019, starting with the midsize 460SJ, following a phased introduction in the months afterwards of the rest of the boom portfolio. ■

Website: www.jlg.com



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MB CRUSHER

The new MB-HDS shafts screener from MB Crusher can be used in various applications to process a wide range of materials, such as excavation and demolition materials, asphalt, coal, organic materials, wood, bark and light plastics. It also enables the products to be re-purposed immediately.

The new screening bucket can be mounted on excavators, diggers, mini diggers and loaders - from 5 to 35 t – to perform works on construction sites and areas with large pipelines, towns or remote agricultural areas. There are four models available in the MB-HDS series, with shafts suitable for different material selection requirements. Changing of the rotary shafts can be carried out anywhere; they have a centralised greasing system and all maintenance tools are located inside a compartment of the shafts screener.

The MB-HDS series also takes care of the machine on which it is installed. An automated shock-absorbing hydraulic system reduces the discharge so that the engine, transmission components and the machine boom do not suffer any damage. ■

Website: www.mbcruiser.com



RIGHT: The MB-HDS shafts screener mounted on an excavator.

VERMEER

The Vermeer SPX25 vibratory plow is designed for fast and efficient cable/fibre and irrigation system installation. It features a full-function remote control that gives the operator a 360-degree view of the jobsite. The machine offers a transport speed of 6 km/hr.

The 25 hp Kohler gas engine provides the SPX25 with ample power for installing small pipes and cables at depths up to 30.5 cm, as well as for boring underneath driveways and sidewalks using the optional Porta Bore attachment. The dual rubber tracks with a ground pressure of 3.7 psi delivers great floatation in soft ground conditions and helps reduce jobsite restoration after an install.

For efficient turning, while installing utilities around obstacles, the SPX25 is fitted with a pivot-mounted plow with a 55-degree swing angle that automatically adjusts when turning. An optional reel carrier can be mounted to the machine, minimising the amount of jobsite equipment and labour needed on the jobsite. Contractors also have the option of adding a weight kit for improved traction when working in hard ground conditions.

In addition, the Vermeer S925 mini skid steer provides a tip capacity of 1,198.8 kg, rated operating capacity of 419.6 kg and maximum hinge pin height reach of 214.6 cm. The machine features a dual auxiliary system, which allows the operator to switch between high flow for ground-engaging attachments and low flow for maximum control. It is also equipped with a universal mounting plate that fits a broad range of Vermeer-approved attachments.

The S925TX is available in three smooth-running, high-torque, four-cylinder engine options, including a 24.8 hp Kubota V1505 diesel engine, 40 hp Kubota WG1605 gas engine and 35.1 hp Kubota V1505 diesel engine offered only for international markets. Contractors can further customise the machine with either 17.8-cm-wide tracks that produce 5 psi of ground pressure or 22.9-cm-wide tracks with 4 psi of ground pressure for better floatation.



Vermeer SPX25 vibratory plow (above) and S925TX mini skid steer.



The S925TX has a travel speed of 6.6 km/hr and it is also built with a chariot-style platform for optimum operator comfort, and pilot-operated ground drive to help the user maintain smooth control on the jobsite, as well as in tight areas. ■

Website: www.vermeer.com

SKYJACK

The SJ4740 DC electric scissor lift was the first of the next generation Skyjack had on stand. The changes made to the next generation machines help create a more globally aligned range, and the company stated that by the end of 2019, all of its DC electric scissor lifts will boast several improvements. These include a new control box, single location emergency lowering switch, adjusted pothole protection, new SkyCoded diagnostic display, and a more rigid scissor stack.

The SJ9253 RT is Skyjack's largest scissor lift to date with a working height of 17.98 m, and is the first model in the company's new full-size rough terrain range. This new range replaces the existing 88-in and 92-in models and consists of the SJ9233, SJ9243, SJ9253 and SJ9263 RT.

Skyjack also has plans for a larger rough terrain scissor lift that would make work at six stories possible, increasing the number of applications these machines could be used for. The SJ9263 RT with a working height of 21.03 m is in its final design phase and is targeted for launch in the fourth quarter of 2019.

The new full-size rough terrain lifts boast increased working heights, increased capacities, faster function speeds and a large work platform. They also feature an enhanced control system – maintaining Skyjack's colour coded and numbered wiring system, while further improving the ease of troubleshooting and integration with the company's Elevate telematics solution.

A key improvement to the full-size rough terrain range is Skyjack's Smartorque technology. It provides the machines with excellent torque and hydraulic performance, but with less engine horsepower. Skyjack said the system has been used on its TH series since 2015 and it does not require diesel particulate filter (DPF), diesel exhaust (DEF) and no other active exhaust after treatment, making it extremely beneficial to rental companies. ■

Website: www.skyjack.com



Skyjack SJ4740 DC electric scissor lift (left) and SJ9253 RT full-size rough terrain scissor lift (top right).

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ALLU

Allu Mapei Circulus is an eco-friendly system developed through collaboration between Allu and Mapei, which transforms returned concrete into a high-quality recycled aggregate. It is aimed at large- and medium-sized RMC producers or cement/concrete recycling companies who wish to reduce the cost of handling returned concrete waste.

In addition to positive environmental effects, the system could generate substantial savings in production due to less new material needed. According to Allu, savings of up to tens of Euro's per cubic meter of concrete produced is possible as a result of savings towards landfill cost and reduced costs for virgin aggregate.

The system is simple and requires minimal investments - it only uses the Mapei Re-Con Zero chemical and an Allu Transformer bucket. With Re-Con Zero, the wet returned concrete is transformed into a dry granulate. The Allu Transformer then processes the hardened lumps and screens them into the specified aggregate size to be recycled with fresh concrete. A concrete manufacturer may then use between 5% and 30% of the recycled aggregate with new concrete. This would bring significant savings to the cost of buying virgin aggregate. The system can also cut down the amount of washed out sludge from concrete trucks. ■

Website: www.allu.net



ALL IMAGES:
The Allu Mapei Circulus system transforms returned concrete into a high-quality recycled aggregate. This solution only needs the Mapei Re-Con Zero chemical and an Allu Transformer bucket.

DOKA

Among Doka's innovations at bauma was the DokaXlight aluminium framed formwork. At 21.5 kg per main panel (0.75 m x 1.50 m), it offers ease of use on construction sites. Having the capacity to withstand concrete pressure of up to 50 kN/sq m for wall formwork and up to 75 kN/sq m for column formwork, this multi-functional system also provides a fast pouring rate.

The DokaBase basement construction method with integrated external insulation is a new approach to building watertight concrete walls. It combines the three critical work steps – forming, insulating and sealing – in a single system. The outside formwork also serves as insulation and remains permanently on the structure. The fresh concrete acts as an adhesive and, combined with the DokaBase panel, forms a full-surface, durable connection that is safe from backflow. The interaction between these two factors eliminates the need for additional waterproofing.

The Doka Monolithic allows walls, columns, drop beams and slabs to be poured in a single operation. In cooperation with the Malaysian company MFE Formwork Technology Sdn Bhd, Doka has extended its presence in Southeast Asia, Latin America and the Middle East.

In addition, the DokaRex alignment strut is specially designed for use with precast concrete elements. With only four different strut types, it covers the length range from 1.80 to 10.20 m. Its lightweight and ergonomic design makes it easy and convenient to work with. As an option, DokaRex can also be used with wall formwork. ■

Website: www.doka.com



ABOVE: The DokaBase basement construction method with integrated external insulation is a new approach to building watertight concrete walls.

BELOW: The Doka Monolithic enables walls, columns, drop beams and slabs to be poured in a single operation.



Both images © Doka

BROKK

Brokk introduced its new machine, the Brokk 70. This follows the company's introduction of four new models last year and extends its SmartPower lineup of machines.

The new Brokk 70 is designed for safe, mechanised and efficient demolition tasks in the most confined spaces. Compared to its predecessor, the Brokk 60, the new machine delivers much more demolition power (more than 100%, said Brokk), is equipped with the Brokk SmartPower technology, and features a powerful and fine-tuned hydraulic system.

The Brokk SmartPower electric powertrain increases its power from 5.5 kW to 9.8 kW, and enables the Brokk 70 to power twice the size of breaker as the Brokk 60. The combination of Brokk SmartPower technology and Brokk's upgraded hydraulic design results in both smoother and more precise movements for the Brokk 70. Furthermore, the stronger hydraulics and completely redesigned mechanics of the Brokk 70 allows the machine



to carry and wield heavier and more powerful attachments.

The Brokk 70 comes with several new attachments. The new Brokk BHB105 breaker weighs in at over 100 kg and has advanced features, such as water spray to suppress dust and air cooling for hot environments. The new Brokk BDC40 drum cutter provides excellent cutting power, and the new Brokk G32 demolition grapple is the tool of choice for more efficient soft demolition tasks.

The Brokk 70 is as compact as its predecessor. It weighs only 560 kg, fits through narrow doorways and can be transported in an ordinary passenger elevator. Also, it still runs on a 16 Amp fuse. ■

Website: www.brokk.com

Brokk 70 demolition robot.

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RUBBLE MASTER

Rubble Master has taken the development of its RM GO! product line to the next level with the unveiling of the RM 120GO! Next hybrid crusher. With this latest innovation, the RM MSC8500e - the hybrid screen developed by Rubble Master and Maximus - can be powered through the new RM 120GO! Next.

The RM MSC8500e was built based on the RM MSC8500M screen unit. The machine's hydraulic drives have been replaced with electric ones, and only the crawler gear remains hydraulic.

Both the RM 120GO! Next crusher and RM MSC8500M screen can now operate from a single power source. The crusher's high-power generator supplies the electricity without the need for an additional diesel engine, thus reducing emissions and noise levels. Apart from the single source crushing, the hybrid screen can also be operated by a diesel engine or other external power sources.

Furthermore, the screen and the crusher can communicate with each other without wires or cables, said Rubble Master. When the crusher's discharge belts are started, the screen also starts automatically. If blockages or faults occur, the screen also stops automatically.

The RM Operations Assist makes communication between operators and machines easier. LED lights in three colours (green, yellow and red) show the machine's current status. Essentially, these machine communication lights distinguish between operation, service and alert and they are standard features on the RM 120GO! Next and RM MSC8500e.

The RM GO! Smart app provides live data on the machine, daily reports, and in the event of problems, instructions on remedying the fault direct to the smart terminal. ■

Website: www.rubblemaster.com



RM 120GO! Next crusher and MSC8500e screen.

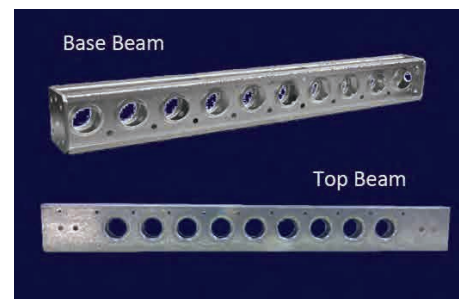
SUCOOT

Taiwan-based manufacturer Sucoot Co Ltd participated at bauma to reinforce its position as a global brand, both in the civil and building industry. The company introduced its base beam and top beam, both of which can be assembled into system formwork for cast-in-situ viaduct in bridge projects. Due to its high versatility, the system enables users to make only small adjustments to adapt to the variation of structure.

The base beam is made of high tensile steel to provide maximum load capacity. It is available in six lengths, and with A325 bolt it can be assembled into larger formwork panels up to 5 m x 12 m. The top beam is every 30 cm in units; its strength and lightweight properties deliver optimal working combinations.

The ring system scaffolding and pre-assembly towers could be performed flatly on the ground, said Sucoot, which not only minimises the risk of falling but also saves labour and reduces downtime. ■

Website: www.sucoot.com



ALL IMAGES: Sucoot's base beam and top beam (left) can be assembled into system formwork for cast-in-situ viaduct in bridge projects (below and bottom).



COMANSA

Spanish tower crane manufacturer Comansa announced at bauma that it will add another model to its range of large flat-top tower cranes. The new 21LC1400 will be available worldwide from September 2019, featuring two versions: 50 t and 66 t maximum capacities.

Expected applications for the 21LC1400 include PPVC (prefabricated prefinished volumetric construction) and infrastructure projects, but the crane is also suitable for other jobsites where lifting heavy loads are required.

Like Comansa's most recent large flat-top models, the counterjib of the new 21LC1400 will feature a modular design to significantly reduce the counter-radius in restricted jobsites. A new single and compact trolley has also been designed for the 21LC1400 - instead of the double trolley system - as this crane will work mainly in projects in which the maximum load capacity is needed in almost every lift, like PPVC.

In addition, Comansa will introduce the Quick Set, an electronic limitation system that aims to reduce the set-up time of its cranes from three hours to 45 minutes. It will be available as an option on all Comansa flat-top models of the LC range. This system is ideal for rental companies, which usually have to dismantle and move their cranes from site to site quite often.

At bauma, Comansa displayed its 50-t 21LC1050 flat-top crane. It has a maximum radius of 80 m with optional radius of 85 m and 90 m, and is also designed mainly for large industrial, infrastructure and PPVC projects. The crane comes with the Comansa Cube cab.

Website: www.comansa.com



LEFT AND BELOW: The new Comansa 21LC1400 flat-top crane is expected to be available from September 2019.



ABOVE AND BELOW: Comansa 21LC1050 flat-top crane featuring the company's Cube cab.



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CHEMGROUT

The ChemGrout Geotech series can pump a wide variety of materials, including neat cement, high ratio sand/cement, bentonites and non-shrink grout. These simple, easy-to-use grout plants offer a balanced design and are ready for jobsite operation.

Both the mixer and pump feature centrally located, variable speed controls for quick adjustment. The mixer utilises specially designed blades and baffles that develop a high shearing action, ensuring a rapid and thorough mixing process.

The mixer, hopper and grout pump are a balanced system allowing the mixer to stay ahead of the pump to deliver a continuous output of material. After mixing, the material is transferred to the lower hopper through a large slide gate designed to handle high ratio sand/cement, neat cement and non-shrink grout. This efficient use of a holding hopper enables a new batch to be mixed while the first is being pumped.

The Geotech series is equipped with a single acting, variable speed CG-031 piston pump that can handle materials ranging from fluid slurries to heavily sanded grouts. This piston pump provides ease of operation and low cost of maintenance. The staple lock construction holds all working components together, allowing parts to be easily accessed for cleaning and maintenance. The pump can also be disassembled and reassembled quickly by using a hammer.

The compact skid mounted versions of the Geotech series are available in air, hydraulic, gas/hydraulic, electric/hydraulic and diesel/hydraulic power options. The trailer mounted CG555/GT is available in a single tank design and is a fully integrated system, combining mixer, pump and power system.

In addition, the ChemGrout CG460/2X8 HP colloidal series is specially designed for the grouting of hollow bars, tiebacks and ground anchors. The machine has two high-shear colloidal 265-l mixing tanks, and a double acting, high-pressure plunger 2X8 grout pump.

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



ChemGrout Geotech series (above) and CG460/2X8 HP colloidal series grout plants.

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 grout plant is available in a variety 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. ■

Website: www.chemgrout.com

IPAF

The International Powered Access Federation (IPAF) launched its Street Smart safety campaign, which outlines the dangers of using mobile elevating work platforms (MEWPs) on or next to roads. With the risk of being struck by a passing vehicle such as bus or truck, prior planning is needed so the MEWP can operate safely.

“MEWPs are designed to safely conduct temporary work at height in just about every environment, including on roads or in public places. However, being hit by a bus or truck while operating a MEWP is a leading cause of serious injury or death, according to our accident analysis,” said Tim Whiteman, CEO and MD of IPAF.

“These accidents are almost always catastrophic,” added Andrew Delahunt, technical and safety director of IPAF. “It is critical to segregate the working area to have separation from



traffic. Operators should ensure they are seen by using signs, cones, beacons and high-vis clothing.”

Key points of guidance in the campaign include: Plan ahead – assess risk; Develop and use a traffic management scheme; Be visible – wear hi-vis PPE to position cones/signs; Ensure vehicles are conspicuous (use flashing beacons/rear chevrons) and work areas well lit; Manage traffic – use temporary traffic lights or close roads to separate the working area; Use signs and cones for maximum warning to oncoming vehicles; Implement an exclusion zone – segregate the working area from passing vehicles; Position the MEWP so it does not overhang into traffic; and Load and unload safely – in a well-lit area, away from traffic or obstructions. When unloading next to a road make sure it is segregated from traffic. ■

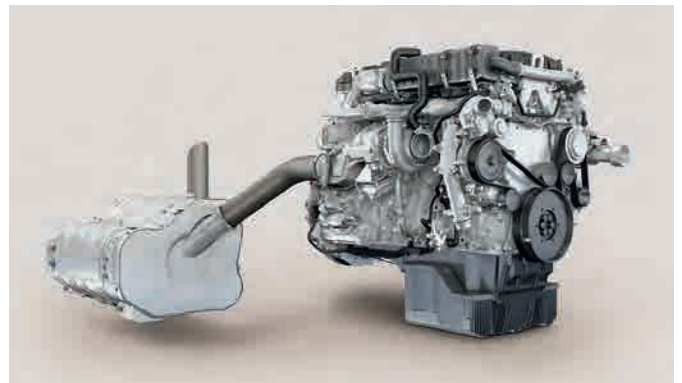
Website: www.ipaf.org/safe

MTU

Rolls-Royce presented its EU Stage V MTU engines for the construction equipment and industrial sectors. The MTU Series 1000, 1100, 1300 and 1500 engines were given certificates of compliance with EU Stage V emission requirements in March 2018, and have been available as standard production engines since June 2018.

According to Rolls-Royce, the first units have already been delivered to several OEMs including Tadano, Hidromek, Kato, Manitowoc, Bomag, Bell and Hyster. Based on Daimler commercial vehicle engines, these diesels cover a power range of 115 to 480 kW. The new limits are achieved by internal engine enhancements and by adding an SCR system and an additional diesel particulate filter (DPF). As well as reduced CO₂ emissions, the torque, performance and fuel consumption of the engines have all been improved.

Rolls-Royce also offers a one-box SCR-DOC-DPF solution to integrate all components into the limited installation space of the machines. This exhaust gas aftertreatment system is both compact and robust. The box meets the requirements of machine manufacturers and operators, as it is easy to install, operate and maintain. Apart from being certified to EU emission Stage V, MTU engines are also certified to the US Environmental Protection Agency's Tier 4 Final. This dual certification provides



MTU Series 1000, 1100, 1300 and 1500 engines from Rolls-Royce are now compliant with EU Stage V emission requirements. The company also offers a one-box SCR-DOC-DPF solution for exhaust gas aftertreatment.

high flexibility for Rolls-Royce customers when it comes to selling their machines.

In addition, MTU Series 2000 engines (567 – 970 kW) for construction equipment, industrial and mining applications will be available with EU Stage V certification from the end of 2022. ■

Website: www.mtu-online.com

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BAUER

Bauer displayed several of its drilling rigs, including the BG 20 H (based on the BT 50 base machine). It has a torque of 200 kNm and transportation width of just 2.5 m. The machine's integrated service platform enables easy access to all maintenance and service points in the upper carriage. The platform also meets the highest standards in terms of occupational safety. Other Bauer rigs on exhibit included the BG 23 H, BG 33 and BG 45 from the Premium Line series.

Bauer MAT Slurry Handling Systems unveiled the new CMS-45 container mixing plant. Its mixer, water tank, agitator container and control cabinet are permanently installed in a 20-ft container frame and connected to flexible lines. This makes the CMS-45 compact, space-saving and easy to move, thereby reducing the time needed for assembly and disassembly.

The centrepiece of the CMS-45 is a 1.8-cu-m colloidal mixer with an off-centre

mixing tool, as well as an external circulation line that ensures optimum dispersion of the slurry while simultaneously increasing the mixing capacity. A 15-in touch screen allows the operator to enter up to 10 different formulas with 10 sequences each and display the current batch data at any time.

A highlight from Klemm Bohrtechnik was the new KR 806-3GS drilling rig. The machine's kinematics, and some other elements, have been redesigned from the ground up compared with the previous model.

The KR 806-3GS drill rig is built for power-intensive double-head systems, hydraulic hammers and rotary drives. The hydraulic system includes a dual-circuit load-sensing system with load limit control and power sharing. The hydraulic mobile valve banks are integrated directly into the Can-Bus system. They respond with a high

level of sensitivity and are self-regulating, making them temperature-independent and highly precise.

The EEP efficiency package of the KR 806-3GS incorporates a power and energy management system that automatically adjusts the speed to the respective load and operating status. Fuel consumption and noise emissions are considerably reduced. As standard, all functions can be remotely controlled via radio. The machine controller's functional safety complies with Performance Level C (ISO 13849), making its design very resistant to faults and fail-safe.

In addition, RTG Rammtechnik showcased two of their rigs: an RG 27 S, designed for the CSM method, and an RG 19 T with its SilentVibro MR 150 AVM sound-insulated vibrator. The latter was equipped for installing sheet pile walls. ■

Website: www.bauer.de



FAR LEFT: Bauer BG 20 H drilling rig.
LEFT: RTG RT 19 T drilling rig.
ABOVE: Klemm KR 806-3GS drilling rig.
BELOW: Bauer MAT CMS-45 container mixing plant.



CARMIX

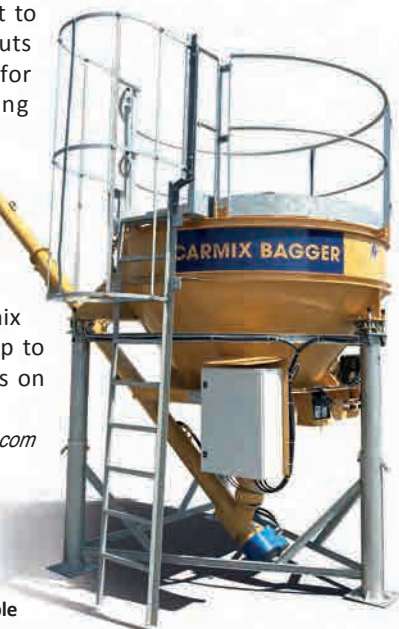
Metalgalante showcased its new Carmix Bagger, a mini silo that helps to speed up the cement loading process and ensure high accuracy of the mix design. It is compatible with all Carmix machines, from large off-road mobile concrete batching plants such as Carmix 3500 TC, to small self-loading concrete mixers like the new Carmix 45FX.

With a capacity of 3 cu m, the Carmix Bagger incorporates a load-cell container that weighs the quantity of materials loaded. Thanks to this special construction, both normal-sized cement bags and big bags may be used. After loading, a feed screw transfers the content into a Carmix batching plant. The whole process is fully autonomous, said Metalgalante. Each operation is controlled by a hydraulic motor/actuator, fed by an engine. As a result, the Carmix Bagger can be used on jobsites where no electric power is available.

Some features of the Carmix Bagger are designed to simplify the operators' work, leading to greater productivity and less costs. Metalgalante added that the silo can be easily carried by a forklift, and thanks to its compact size, it only takes up half a 20-box container, minimising shipping costs.

In addition, the use of cement big bags makes the work more environment-friendly reducing dust to a minimum, and it cuts the operating costs for bag disposal. Loading the big bags directly also contributes to reducing raw material costs and it raises productivity, as Carmix Bagger can contain up to three 1-cu-m big bags on each cycle. ■

Website: www.carmix.com



RIGHT AND BELOW: The Carmix Bagger is compatible with all Carmix machines.



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Automatic climbing formwork Xclimb 60 is a hydraulically climbed system that can also be lifted quickly by crane. It is guided on the structure at all times, so the system can be repositioned even in windy conditions.

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The Formwork Experts.

KOBELCO

Kobelco Construction introduced its largest excavator, the SK850LC-10E – the latest addition to the company's Generation 10 range. Powered by a Hino engine, the machine delivers excellent strength and performance through its 2,120 Nm of torque and 380 kW of power.

The SK850LC-10E features Kobelco's new cooling system – a hydraulically driven twin-fan engine cooling system. This hydraulic version prevents over-cooling by using integrated sensors to reduce the speed of the twin-fan unit, increasing efficiency and reliability. Technically advanced systems in the engine's dynamics have also been designed to help reduce the machine's carbon footprint and meet the new Stage V emissions regulations.

The conventional SK850LC-10E, with standard boom and four arm variations, is well suited to general construction and excavation jobsites. According to Kobelco, extensive development and testing has been undertaken in quarry conditions in China, India and some Southeast Asian countries, which proved the machine's hardworking and durability credentials. An 'ME' version of the SK850LC-10E, with short boom and short arm, is also available specifically for quarrying. A demolition (DLC) version is expected to be released in 2020.

Kobelco also unveiled its first electric mini excavator concept, the 17SR. The company plans to further develop the machine over the next two years - in conjunction with the German engine manufacturer Deutz - and expects to make an official launch in the European market in 2021.

The development of the electric powered 17SR comes just three years after the introduction of Kobelco SK210HLC-10 Hybrid excavator in Europe, further reinforcing the company's goal to reduce environmental impact.

In addition, Kobelco showcased its 300-t capacity crawler cranes, namely the CKE3000G for the European market, the standard CKS3000, the CK3300G-2 for the North American market, and the 350-t capacity Super Heavy Lift (SHL) models.

The CKE3000G, CK3300G-2 and CKS3000 are currently the largest models in Kobelco's multi-purpose CKE/CKS/CK crawler crane series. The company highlighted that since it was launched just over 12 months ago, the 300-t and 350-t crane series has found a ready market across the globe, including North America, Southeast Asia and the Middle East.



LEFT: SK850LC-10E excavator.

BELOW: 17SR electric mini excavator concept.

BOTTOM LEFT: CKE/CKS/CK crawler crane series.



The CKE/CKS/CK crawler cranes are ideal for a wide range of applications across various industries, such as pile driving, steel-component erection, tilt-wall work, industrial equipment installations and other heavy lifting work. Kobelco said that the 350-t SHL model crawler crane, with its long reach and high capacity, has been under evaluation and is expected to go into operation in Indonesia soon. (More information on the CKE/CKS/CK crawler crane series can be read in the Mar/Apr 2018 issue of *Southeast Asia Construction*). ■

Website: www.kobelcocm-global.com

MMM ERBA MAKINA

Turkish company MMM Erba Makina provides a complete solution for the production of gypsum plasterboards - from feasibility studies such as plant and raw material evaluation, to the production process including product formulation and control of the whole process.

The company's gypsum plasterboard production line consists of: gypsum rock crushing and screening, and calcination; grinding and separation; metering, dosing and weighing equipment; foam generator; paper handling - paper splicing, aligning and creasing; mixer, vibrating table and forming unit; setting belt, roller conveyors and accelerating conveyor tables; knife; board turners and board doublers; dryer and heat exchanger; bundler; stacking and packing equipment; and stretch wrapping machine.

According to MMM Erba Makina, its gypsum plasterboard plants are available for the global markets, including Asia. The




MMM Erba Makina's gypsum plasterboard plant.

plants have undergone advancements and improvements in some parts and equipment, like the form-press unit, mixer

and rollers. This allows the plants to meet the DIN 18 180 standards. ■

Website: www.mmmërba.com.tr





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LINTEC & LINNHOFF

Lintec & Linnhoff Holdings Pte Ltd presented its new Lintec Eisanlagen (LEA) concrete cooling plant. The first available model, the LEA 100, is built in a single 40-ft HC sea container with ice production capacity of 100t/day. Due to its containerised structure, it can be stacked on top of the storage containers and the storage units are upgradeable from 60 t to up to 400 t a day.

The LEA 100 is a dual function ice/ice water plant controlled by a single switch. This innovative design allows the production of either ice or chilled water from the same ice generator module.

The LEA 100 plant uses ammonia (NH₃) as the main refrigerant. Ammonia is believed to be the most effective natural refrigerant that is environment-friendly, as it is water soluble and contains simple elemental structure. Furthermore, with its platelet method, the LEA 100 consumes up to 30-50% less energy compared to conventional drum ice plants, said Lintec & Linnhoff.

The company also pointed out that the LEA 100 plant offers excellent durability and flexibility, enabling it to handle water of far greater total dissolved solids (TDS) levels than any conventional ice plants can handle. The first-in-first-out (FIFO) principle in the LEA plant ensures that the oldest ice is consumed first to avoid any blockage or glaciation from older and stagnant ice.

In addition, Lintec & Linnhoff introduced its new Lintec CSE containerised asphalt plant series. The model currently available

is the CSE3000, with an average capacity of 220 - 240 t/hr (at 3% moisture content).

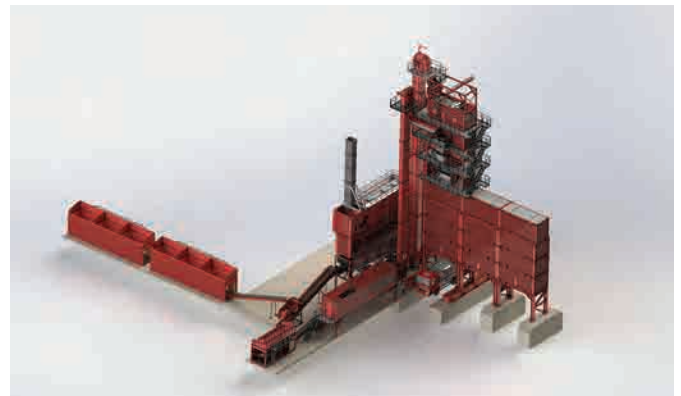
The company said the new CSE series has been developed to provide an option of a highly versatile containerised asphalt batching plant. The basic concept of CSE structure allows the plant to be easily retrofitted and upgraded in the future without any major structural modification.

The CSE plant is highly customisable to be a city plant. The basic plant can be easily upgraded with the Lintec Ecological Processing (LEP95) warm asphalt mix system, hot or cold recycling system, environmental protection system for the bitumen fumes, foreign filler silo, integrated hot storage silo, and so on.

Lintec & Linnhoff is a global manufacturer of asphalt and concrete batching plants under the Lintec, Linnhoff and Eurotec brands. The company also provides innovative pavement related technologies and machinery as well as specialist concrete cooling solutions that meet or support industry standards for environmental impact, recyclability and reusability.

At bauma, Lintec & Linnhoff also organised a special event to celebrate its new brand identity and 100 years of business operation. *(More information on the company's new brand identity can be read in the Mar/Apr 2019 issue of Southeast Asia Construction).* ■

Website: www.lintec-linnhoff.com



ABOVE LEFT: Lintec LEA100 concrete cooling ice plant and storage container arrangement for a maximum production capacity of 400 t/day.

ABOVE: A 3D illustration of Lintec CSE3000 asphalt batching plant.

FAR LEFT AND LEFT: Apart from introducing its Lintec CSE3000 and LEA100 plants, Lintec & Linnhoff also held a special event at bauma to celebrate its new brand identity and 100 years of business operation.



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LINK-BELT

Link-Belt launched its 110-t 120|RT rough terrain crane, equipped with a six-section 11.6–50 m pin and latch formed boom. An available two-piece 10.7–17.7 m on-board offsettable fly provides greater flexibility and range, and manually offsets at 0, 15, 30 and 45 degrees. One-person fly erection technology minimises work at height with ground controls for fly assist and boom hoist cylinders. Two 4.9-m lattice insert extensions offer a maximum tip height of 79.8 m.

The 120|RT's six-speed transmission is powered by a dual compliant 173-kW Cummins Stage V/Tier IV QSB 6.7L, and it is also available with a 179-kW Cummins Tier III QSB 6.7L diesel engine. Four 29.5x25 tyres mounted on axles affixed to the carrier via greaseless four-link suspension, eliminating 10 previous grease points. Centralised electrical locations, remote mounted filters, and easy-access fluid checks make routine service a breeze.

A 24-V electrical system enables quick and easy diagnostics. The wiring is a Controller Area Network (CAN bus) system. The 24-V system yields the ability to multiplex with modules placed near dedicated functions like outrigger beams and winches. In total, there are five modules located throughout the machine that allow crane functions to continue working in instances where other modules are being diagnosed or serviced.

Link-Belt's V-CALC (Variable Confined Area Lifting Capacities) system features 81 different outrigger configurations with real time 360-degree charts. Once outriggers are set, the user-friendly Pulse 2.0 system indicates the crane's available capacity. The system then previews the operator's real time capacities given the crane's current configuration at the next five radiuses for a set boom angle.

Upon selection, the Pulse 2.0 provides a live view of the working area with colour-coded quadrants. If the chart exceeds capacity at a given slew angle, swing arrest will initiate five degrees prior – allowing the crane to come to a smooth stop.

High-strength steel used in the upper frame accommodates a new winch design with ultra-wide drums for increased line pull at higher working layers. Maximum winch line pull of 105.1 kN provides a wider range of applications. Hydraulic outboard routings and wiring harness improvements offer form-fitted design, resulting in greater

serviceability over the life of the crane. Three slabs of hydraulically removable upper counterweight totalling 13.2 t is standard equipment.

Link-Belt's new cab design offers excellent visibility, operator comfort and intuitive design. All electrical components coming into the cab are bulk headed for 'plug and play' assembly. Other features include 20-degree tilt, ergonomic seat with electronic joystick/single axis controllers, USB and 12-V power supply connections, and automotive-type, high capacity HVAC system, to name a few.

Link-Belt Pulse 2.0 provides a simple interface for crane operators with a large 25.4-cm touchscreen display, along with customisable programmable features. The system can be updated and serviced remotely.

For easy maintenance, Link-Belt carefully considers the location of swing out engine access doors and centralised electrical locations – keeping them accessible from the ground or near a grab handle or ladder. Transmission oil, engine oil, primary and secondary fuel filters, as well as the engine oil filter are mounted for easy reach.

The 120|RT has also been fitted with all the necessary tools to get the job done, such as dual amber strobe lights, LED working lights, outrigger lights, work platforms on the upper with guardrails, operator programmable function kick outs, and telematics in place to give real time data to better forecast maintenance and service needs of the crane. Link-Belt's camera vision package on the 120|RT enhances on-board site monitoring and includes a back-up camera, as well as cameras for viewing winches and the right side of the upper.

The 120|RT will transport with base unit fully equipped minus modular counterweights at 42,852 kg. With an overall height of 3.91 m, this rough terrain crane can be driven right off a conventional lowboy trailer, assemble counterweight and be ready to go to work.

Link-Belt also presented other models at bauma, such as the five-axle 150-t 175|AT all-terrain, 90-t 100|RT rough terrain and 235-t TCC-2500 telescopic crawler cranes. ■

Website: www.linkbelt.com

LEFT: 120|RT rough terrain crane.

BELOW: 100|RT rough terrain crane.

BOTTOM: 175|AT all-terrain crane.





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CCMA & CCCME

China Construction Machinery Association (CCMA) and China Chamber of Commerce for Import and Export of Machinery and Electronic Products (CCCME) shared the latest update on the Chinese construction machinery industry.

Through 40 years of development with Reform and Open policy, China has become one of the biggest manufacturing markets in the world. In recent years, the Chinese construction machinery industry has grown significantly, with export volume reportedly having reached US\$21.5 billion by November 2018.

To help Chinese companies contribute towards the Belt and Road Initiative (BRI), the Chinese government has selected bauma 2019 as a platform to promote Chinese construction machinery brands globally. More than 10 major Chinese OEMs like XCMG, Sany, Zoomlion, LiuGong, Sinomach, Shantui, Sunward, CRCHI, CREG, Dingli and others, along with more than 100 Chinese parts and components suppliers, participated at the show.

'Creating local and global records'

The production volume of mobile cranes in China is the highest in the world, said CCMA and CCCME. XCMG, Zoomlion and Sany are listed as the top three manufacturers in the local market. With their technology capacities and manufacturing abilities, these companies plan to continue creating domestic and international records for lifting capacities of crawler and wheeled cranes. In 2018, the sales volume of construction cranes in China was 32,278 units, while export volume was 2,125 units.

In the tower crane sector, Zoomlion, XCMG and Yongmao are listed as the top three manufacturers in the Chinese market and also the top 10 in the world, stated CCMA and CCCME. Large-scale infrastructure projects in China are believed to have boosted the development of tower cranes sector in the country.

The production volume of excavators in China also ranks the highest in the world, according to CCMA and CCCME. Sany, XCMG and LiuGong are the top three manufacturers in the local market. In 2018, the sales volume of excavators in China reached 203,420 units, and export volume was 19,100 units.

Likewise, the production volume of wheel loaders in China takes the first place globally, with the highest record of annual output (250,000 units), revealed CCMA and CCCME. LiuGong, SDLG, XCMG, Lonking, XGMA and Sinomach are the top six manufacturers in the Chinese market. In 2018, the sales volume of wheel loaders in China reached 118,811 units, whereas export volume was 23,260 units.

In the road machinery sector, Chinese manufactured rollers and bulldozers are quite notable as well. Shantui and Sinomach are two of the well-known bulldozer manufacturers, while XCMG, XGMA and Sinomach are the top three roller manufacturers in the Chinese market. CCMA and CCCME mentioned that XCMG has also ranked no. 1 in terms of roller production volume worldwide. Since mid 1990s, massive highway construction in China has helped with the progress of road machinery sector in the country. In 2018, the sales volume of rollers in China reached 18,376 units, and export volume was 3,202 units.



ALL IMAGES: CCMA and CCCME provided the latest update on the development of Chinese construction machinery industry.

As for TBMs, CRCHI and CREG are two prominent manufacturers. CCMA and CCCME pointed out that the booming metro construction projects in China have facilitated the growth of Chinese TBM sector and in recent years, it has been representing the fastest growing and most profitable sub-sector in the domestic market. In 2018, the sales volume of TBMs in China reached 450 units.

Furthermore, XCMG, Zoomlion, Sany, LiuGong and SHIG have also established their production base in other countries, such as Germany, America, Italy, Poland, India, Brazil and Belarus. Many Chinese manufacturers have merged with their global counterparts, either through acquisitions or collaborations. These include Zoomlion and Italian manufacturer CIFA, Sany and German manufacturer Putzmeister, XCMG and German manufacturer Schwing, LiuGong and Polish manufacturer Dressta, and SHIG with German manufacturer Linde Hydraulics, among others. ■

Website: www.cccme.org.cn & info.cncma.org/list/ccma.shtml



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TEREX CRANES

The Terex RT 90 rough terrain crane offers a five-section, fully hydraulic boom that extends to 47 m. A 17 m bi-fold jib further enhances the machine's reach and versatility. Designed for easy operation, the Terex RT 90 features a control system with integrated diagnostics, a new ergonomic cab design with an 18-degree tilt and an easy-to-access flat deck for safety, superior usability and comfort.

Operators can access lift information through the Terex IC-1 control system, which delivers an efficient and intuitive touch-screen operation as well as all load charts. The electro-proportional joysticks and an integrated system design provide the operator with precision controls. The setup of joystick functions can be configured to the operator's own preferences. The Terex RT 90 also features four steering modes, including two-wheel, four-wheel, crab and independent rear axle steering for easy positioning and extensive versatility on the jobsite.

With a narrow width of just 3 m and removable counterweight, the Terex RT 90 can be trailered without weight and width restrictions in most situations. The central lubrication system also helps to reduce service costs and time. The crane is in compliance with both European and US regulations (RT 100US for North and South America), and is available with either a Tier 4F or Tier 3 engine to serve the global markets.

In addition, the new Demag CC 2800-2 lattice boom crawler crane is designed to be as versatile as its predecessor, the CC 2800-1. The new model is suitable for infrastructure projects, including road and bridge construction, and also for erecting wind turbines and refinery works.

According to Terex Cranes, several components of the CC 2800-2, such as the luffing jib or the middle main boom inserts, can be used with the CC 2800-1. As a result, customers are able to order the new CC 2800-2 only with the required components and therefore reducing the corresponding capital investment. The basic unit of the CC 2800-2, on the other hand, was adapted to that of the CC 3800-1 and its strong drivetrain was included as well.

The CC 2800-2 has a maximum lifting capacity of 600 t and maximum load moment of 7,712 tm. The length of its main boom is 102 m; in the Superlift LSL configuration, its boom length extends to 138 m, which can be once again increased with a luffing jib and the Superlift SWSL to a system length of 192 m. The main boom combined with the lightweight, rigid 12-m LH + LF extension reaches a length of 114 m, and with the Superlift system plus the mentioned extension, a total length of 153 m is possible.

The new CC 2800-2 is also designed for simple and efficient transport. For example, the A-frame and auxiliary hoist can be removed for transport and the SL mast, like that of the CC 3800-1, now consists of three (previously four) separate parts. The base crane, with a height of 3.195 m, weighs 77.1 t.

With the A-frame removed, the weight of the base crane is reduced to 62.6 t. The two frames used for the counterweight plates, instead of the conventional and significantly heavier base plates, also contribute to weight optimisation at 10 t each. Likewise, the weight of the tracks has been optimised compared with the CC 2800-1. With the standard drive and 1.5 m track shoes, the total transport weight is 37.8 t; with the Quadro drive, it is 41.5 t.

Moreover, the Demag CC 2800-2 is equipped with features that support the safe use of the crane. These include the ESTA-award-winning fall protection system for working at height, plus wide



ABOVE: Terex RT 90 rough terrain crane.

LEFT: Demag CC 2800-2 lattice boom crawler crane.

catwalks and platforms that ease walking access for inspecting and maintaining components of the crane.

The CC 3800-1 crane's cabin is used in the new CC 2800-2. With a width of 1.55 m, an ergonomic and functional design that enables continuous fatigue-free work, standard air-conditioning and a CD-radio unit, the cab features excellent comfort. To ensure an efficient operation, the crane is also equipped with the IC-1 control system with two displays as well as two additional monitors that provide the operator with a continuous view of the hoists during operation.

For high efficiency on the jobsite, Demag offers the CC 2800-2 with all technical refinements. These comprise the Vario SL system for continuous, flexible adjustment of the Superlift radius from 11.5 to 15.5 m and the use of Split Tray.

The Split Tray allows for rapidly 'disconnecting' counterweight that is no longer required after the erection of the main boom, saving considerable time on the jobsite. The interchangeability of the counterweights among all Demag and Terex lattice boom crawler cranes in the 300-t-capacity classes and above also reduces costs for the crane owner.

The range of accessories for the new Demag CC 2800-2 is rounded off by the familiar Demag Superlift counterweight wagon, which facilitates moving the crane with the complete SL counterweight as well as the hydraulic telescoping connector for the adjustment of the Superlift radius from 13 to 17 m. Last but not least, the crane is also prepared for conversion to a narrower chassis with the Narrow Track Kit. ■

Website: www.terex.com/cranes

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AMMANN

The new light tandem rollers from Ammann feature drums that can be quickly adjusted from in-line to off-set configurations, helping operators reach compaction goals – even when working near obstructions. The models consist of ARX 23-2, ARX 23-2C, ARX 26-2, ARX 26-2C, ARX 36-2, ARX 40-2, ARX 40-2C, ARX 45-2 and ARX 45-2C. They are powered by engines that are compliant with EU Stage IIIA / US EPA Tier 4 Interim emissions standards.

The in-line setting, which enables equal distribution of compaction forces, is preferred on more open jobsites, said Ammann. The adjustment between in-line and off-set configurations is done manually and is easy for operators to carry out. The articulating joint, which makes the in-line/off-set adjustment possible, is maintenance-free.

The new rollers offer a number of design enhancements, such as an intuitive dashboard layout, a redesign of the front and rear of the machine and a new LED light system. A new protective guardrail has been placed around the dashboard as well. Reduced sound levels improve operator safety, as does the new LED light system.

The 'C' versions are combination machines, which utilise steel drums in front and pneumatic tyres in the rear. Working widths of the rollers range from 1,000 mm on the ARX 23-2 up to 1,380 mm on the ARX 45-2. Weights vary from 2.2 up to 4.6 t. Suitable applications include small and medium construction sites, city roads, boardwalks, city street repairs and road maintenance.

The new rollers are also compatible with Ammann ServiceLink, a fleet management system that enables close monitoring to keep owners informed of machine service needs.

In addition, Ammann's new vibratory plate compactor series – the APR and APH – are equipped with low-vibration guide handles that meet strict work safety requirements. These models are more robust than their predecessors, thanks to a new protective bracket design and additional machine hood reinforcement.

The APR reversible vibratory plates feature high compacting force, flexibility and intuitive operation. They are perfect for gardening and landscaping, and also ideal for road construction applications.

Changing the direction of movement via the guide handle is intuitive. The



ABOVE LEFT: APH hydraulic vibratory plate.
BELOW LEFT: APR reversible vibratory plate.
ABOVE RIGHT: ARX 26-2C tandem roller.
BELOW RIGHT: ARX 45-2 tandem roller.

APR machines perform high-precision compaction work safely and reliably. The new ergonomic guide handle protects the operator from the plate's vibrations. The APR series has a hand-arm vibration value of 2.5 m/sec², which reportedly fulfils even the strictest work safety conditions required by trade association regulations.

According to Ammann, the APR vibratory plate has no impact on operator health and enables fatigue-free operation; consequentially, the restrictive laws on time limitations to compaction work do not apply. There is also no obligation to maintain operating records.

The APR machines are also equipped with steel brackets that protect the drive components from damage caused by shock, impact and fall.

Ammann's APH hydraulic plates are designed with a triple-shaft drive system, which offers smooth movement and a profound compaction performance – even on substrates that are difficult to compact. The hydrostatic Orbitrol steering system leads to precise machine navigation and adds further benefits to the APH series in terms of safety and productivity.

Like the reversible plates, the APH models are also fitted with the new low-

vibration guide handle for fatigue-free operation. The protective hoods are made of impact-resistant plastic, protecting the machine's internal workings from dirt, collision and impact damage.

At bauma, Ammann presented six new APH models with operating weights from 357 to 760 kg. The company said it will continue with its range of APH vibratory plates in the 800 kg weight category – including the remote-controlled model APH 1000-TC for safe operation in hazardous conditions.

The new APH generation is equipped with Ammann Compaction Expert (ACE) technology, which enables intelligent compaction with small machines. ACEecon informs the operator of the current status of compaction via an LED display unit, so that the operator can avoid over-compaction or even a subsequent loosening of the substrate.

The ACEforce system that automatically regulates the vibratory plate's compaction performance is also available. It continuously adapts compaction performance to the substrate's current state of compaction and guarantees an excellent compaction quality. ■

Website: www.ammann.com



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XCMG

XCMG debuted a number of products, including the XCA60E and XCA130_E all-terrain cranes, XCT25L5_E truck crane, XE210E hydraulic excavator, XCA938E and XC958E wheel loaders, XS123 road roller, E-series rotary drilling rigs and several aerial work platforms.

The XCMG XR240E is one of the E-series rotary drilling rigs, fitted with an intelligent control system. The machine is suitable for use in many areas, such as roads, railways, bridges and large stadiums, and it can drill various sizes of holes (up to 70 m in depth and up to 2 m in diameter).

XCMG said the XR240E has been developed based on the D-series rotary drilling rigs, including its single rope and special chassis, and it offers an improved system configuration and advanced technologies, like the innovative modular multifunctional design and a double-swing boom luffing mechanism – thus enhancing the machine's stability by 15% and operation efficiency by 20%.

The company added that with an 'intelligent' engineering design, the XR240E can also carry out automatic operations, such as throwing soil by a one-touch operation and automatic rotary positioning. According to XCMG, the XR240E previously set a record for drilling 4-4.5 holes a day in Guangdong, China - this is believed to be higher than the industry average of 3-4 holes a day.

The XCMG rotary drilling rigs are exported to more than 70 countries and regions in Europe, America, Africa and Southeast Asia, and has been widely deployed for piling foundation, subway construction and other projects.

In addition, the XCMG XE210E hydraulic crawler excavator is designed with energy-saving and environment-friendly features. XCMG said the machine's fuel consumption can be reduced by at least 8%. On top of that, the XE210E is equipped with a multifunctional machine intelligent control system, which allows the operator to select from multiple functions by pressing just one button.

Another highlight from XCMG was its new generation XC9-series wheel loader. The 'intelligent' machine also incorporates eco-friendly features and has been built for high performance, enabling it to perform in all-weather conditions. ■

Website: www.xcmg.com



XCMG XR240E rotary drilling rig (left), E210E hydraulic excavator (below) and XC9-series wheel loader.



XCMG displayed a wide range of products at bauma including cranes, excavators, wheel loaders, rollers, drilling rigs and aerial work platforms.



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WIRTGEN

The Wirtgen booth displayed 120 exhibits, including 18 world premieres and 25 innovations, plus six interactive technology demos. Some of these new products included the Wirtgen 220 SM 3.8/220 SMi 3.8 surface miner, Wirtgen W 210 Fi cold milling machine, Vögele Super 3000-3(i) large paver, Hamm HP series of pneumatic tyred rollers, Kleemann Mobicat MC 120 Z Pro jaw crusher, Benninghoven TBA asphalt plant with hot gas generator, as well as a variety of Deere construction equipment such as the 622GP and 672GP motor graders.

Wirtgen's theme at bauma this year was 'SmartSynergies and Innovations.' SmartSynergies refers to how the specialised product brands (Wirtgen, Vögele, Hamm, Kleemann and Benninghoven) offer ideal solutions for every road construction application, complementing each other well – and they are further enhanced by the synergies created as a result of the Group being part of John Deere.

One of the product highlights, suitable for the Asian market, was the 220 SM 3.8/220 SMi 3.8 surface miner from Wirtgen. The machine can mine raw materials up to a cutting depth of 350 mm and a uniaxial compressive strength of 35 MPa. Thanks to its 3.8-m-wide cutting drum designed specifically for soft-rock mining, this compact unit can achieve maximum productivity at low operating costs. It is excellent for use in small to large mining operations.

Selective extraction makes it possible to mine raw materials with a high level of purity, said Wirtgen. The material, which is extracted in an environment-friendly manner without drilling or blasting, is continuously deposited behind the machine in a

windrow and then loaded onto trucks with other equipment. In this context, refraining from drilling and blasting enables the machine to perform efficient mining operations near industrial sites and other infrastructure such as pipelines or high-voltage power lines, which ultimately results in the optimised exploitation of the deposit.

The cutting drum of the 220 SM 3.8/220 SMi 3.8 is designed specifically for demanding windrow applications in soft rock, such as coal or salt. Six different adjustable cutting drum speeds ensure that the machine can be adapted to the material being extracted. This leads to a significant reduction in pick wear, minimal diesel consumption, and increased productivity, which translate into an impressive daily output and low cost per ton of extracted material.

The 220 SM 3.8/220 SMi 3.8 also meets occupational safety standards in surface mining, featuring a ROPS/FOPS operator cabin - it provides additional soundproofing and vibration isolation, allowing the operator to work for several hours without the risk of fatigue. The ergonomically designed and clearly arranged controls are integrated into the armrests of the seat, and all of the machine's key functions are logically incorporated into the multifunctional joysticks. The fully air-conditioned, large-capacity cabin also offers generously sized windows for great visibility.

The Level Pro Plus levelling system is intuitive and easy to operate. A flat or inclined formation level can be created with absolute precision, thanks to side plate scanning and the cross-slope sensor. The machine is also ready to be fitted with GPS or laser control. ■

Website: www.wirtgen-group.com



Wirtgen 220 SM 3.8/220 SMi 3.8 surface miner.



Wirtgen W 210 Fi cold milling machine.



Vögele Super 3000-3(i) large paver.



Benninghoven TBA asphalt plant with a hot gas generator.



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HYUNDAI

Hyundai Construction Equipment (HCE) presented 15 machines, comprising 11 excavators and four wheel loaders. The company also introduced its advanced digital technologies related to 5G and artificial intelligence (AI). A separate booth called the 'Hyundai Connect Room' was set up to promote the company's digital technologies. Here, visitors had the chance to try out a mobile application that manages multiple construction equipment simultaneously. They could also see the process of remote diagnosis for excavator engines through augmented reality (AR) devices.

With the launch of 5G services in Korea, HCE and SK Telecom offered a demonstration of Live Caster – which gave a real time, ultra-high definition view of construction sites in Korea to visitors in Germany. According to HCE, the company is the first industry player to have unveiled technologies that enable operators to control equipment and use convenience features like music and news with voice command using Amazon's Alexa.

Hyundai Core Motion, an HCE parts subsidiary that was recently launched, also put five key components including main control valves and hydraulic motors in exhibition, thereby spurring the effort to enter the European market.

Among the product highlights from HCE was its HX10A mini excavator, with an operating weight of just 1,000 kg. This new model has a machine width of 730 mm and track width of 700-860 mm.

With its slim design, the HX10A allows for easy transport and excellent access through doorways or operation in confined areas. The mono-boom is mounted on a swing-post, so that the excavator can dig close to a wall or across its entire width. This is particularly useful on small sites where it may not be easy to reposition the machine.

Suitable applications for the HX10A include gardening and landscaping, on construction sites in residential areas, as well as demolition and indoor work. The model offers a tail swing radius of 747 mm, maximum digging depth of 1,766 mm and maximum digging reach 3,092 mm.

The HX10A offers significant benefits for the end-user, providing strong competition in the market sector of micro excavators. The small machine comes standard-equipped with hydraulic hammer piping. The two-column foldable ROPS bar makes it possible to enter buildings via a standard door.

The boom cylinder is top-mounted to prevent potential damage, and servicing of the machine goes quick and easy thanks to the convenient access to the engine. The variable undercarriage increases the stability whenever needed, and the equally extendable dozer blade allows for grading over the full track width.

In addition to the existing Yanmar diesel engine (3TNV70) delivering 9.9 kW of power, the HX10A mini excavator can as an option be operated electrically and emission-free, supplying the same performance characteristics. The Hyundai twin-drive concept is an innovative solution for all applications with zero tolerance for noise and exhaust emission, working indoors and in sensitive areas, such as reconstruction and demolition job in hospitals, homes or commercial zones where operations are ongoing, inside of buildings or halls (including greenhouses) which cannot be contaminated with harmful emissions. ■

Website: www.hyundai-ce.com



TOP AND ABOVE: Hyundai Construction Equipment displayed its excavators and wheel loaders, as well as advanced digital technologies related to 5G and artificial intelligence (AI).

ABOVE AND RIGHT: Hyundai HX10A mini excavator.



MANITOWOC

Manitowoc previewed its first mobile Potain Hup self-erecting crane, the Hup M 28-22. It is the third model from the Hup self-erecting crane range but the first to prioritise mobility, said the company. The crane is scheduled for launch in early 2020.

The new design of the Hup M 28-22 provides excellent compactness. The model is only 11.5 m long when folded, allowing it to work in narrow, restricted jobsites, as well as making it easy to transport from site to site. It also features advanced transport equipment with double steering axles.

The Hup M 28-22 has a 28 m jib and features 16 configurations, which is considered unique to this category of self-erecting cranes, enabling it to be easily adapted for a range of jobsite applications. The crane has a maximum capacity of 2.2 t and can lift 850 kg at its 28 m jib end.

Versatility is delivered with the crane's raised jib that offers four positions: horizontal, 10°, 20° and even 30°. These functions give the crane a height under hook range between 20 and 31 m. Folding or extending the jib is a swift and straightforward operation, with the Hup M 28-22 featuring convenient configurations for both short and long jib lengths.

Operator productivity on the Hup M 28-22 is maximised through Manitowoc's remote control unit. The remote system features a large, coloured screen with easy-to-use navigation and optimised ergonomics for operator comfort. Its Smart Set Up software delivers on-screen information on automatic folding and unfolding of the crane from the crane's remote.

The Hup M 28-22 also benefits from Manitowoc's Drive Control functionality: three selectable profiles for operators that vary the working speed of the crane to suit the application. On top of that, the micro-speed function delivers slow and high precision hoisting.

In addition, Manitowoc showed its two rough-terrain cranes - a 100 t capacity GRT8100 and a 51 t capacity GRT655L. The GRT8100 has a 47 m five-section main boom, which provides better reach and increased versatility. The crane also features the Manitowoc Crane Control System (CCS) with its user-friendly interface, for easier and more efficient operations. Other features include a tilting cab and impressive load charts.

With a full complement of boom extension and insert options, the GRT8100 offers a reach of 77 m. Both 10 m and 17 m manual and hydraulic offsettable extensions are available, as well as a heavy-duty 3 m jib that can be offset to 40 degrees.

The GRT655L is a smaller, 51 t capacity crane yet it boasts similarly outstanding capabilities. It has a 43 m, five-section boom, giving it a reach advantage of 8 m over the closest-competing model, according to Manitowoc. This longer boom gives it a maximum working radius of 36 m and a 80% greater chart capacity than competing cranes at that radius, added the company.

The GRT655L's exceptional chart capacities, manoeuvrability and longer boom length — combined with its compact 3 m by 12.8 m footprint — make it ideal for rental companies, where versatility and flexibility are key considerations. For greater customer choice, Grove also offers a regular boom version of the crane, the GRT655. This is built on the same platform as the GRT655L, but with one less boom section, for a total main boom length of 34.8 m. ■

Website: www.manitowoc.com



ABOVE AND LEFT: Potain Hup M 28-22 self-erecting crane.
BELOW: Grove GRT8100 rough terrain crane.
BOTTOM: Grove GRT655L rough terrain crane.

ELEMATIC

Elematic's new Modifier E9-1200m is used for digging openings and recesses and drilling water holes on fresh concrete slabs on a hollow core production line. The machine can also plot cutting lines, openings and text. It is designed for automatic operation, but can also be operated in semi-automatic and manual mode.

The Modifier E9 features efficient concrete recycling. This is enabled by not using any water in the digging process, which means that concrete removed from openings can be recycled back to the extruder in the hollow-core slab production process. The Modifier thus forms an efficient working couple with the new Elematic Extruder E9.

Slab quality is ensured by mixing the used concrete gradually with fresh concrete as well as with a time limit; the used concrete will not be fed back to the process if it is older than a factory specific preset time value. Together the Modifier and Extruder are a perfect match increasing efficiency and sustainability of hollow-core slab production. Elematic said that concrete consumption with Modifier E9 can be further reduced by an advanced digging mechanism that ensures minimum amount of concrete left on the bed.

The Modifier E9 also saves considerable time by eliminating the need for manual marking of cutting lines or making openings for lifting loop installations and through holes. The machine uses wireless technology to transfer bed plans to its FloorMES machine control system, and it can take the plans directly from BIM systems. Location information is acquired from the laser positioning system. The laser uses a mirror at the end of the bed to measure distance.

The Modifier E9 is fitted with a safety buffer on both ends, including light sensors that protect the area in the middle of buffers. There are also ultrasonic sensors, which enhance safety.

In addition, the new Elematic Extruder E9 offers high casting speed, second-generation automatic compaction control and sophisticated bouncing prevention. Apart from the standard hollow core slab production, the new design of the machine also enables casting of a variety of precast slabs.

Equipped with an advanced touch-screen user interface, improved intelligence and a smart concrete recycling option, the Extruder E9 provides a new kind of modern user experience and significant material savings.

The machine delivers a high casting speed of up to 2.7 m/min - about 30% to 70% faster than its predecessors. According to Elematic, this translates into eight to 10 casted beds in the same amount of time that previously produced only six casted beds. Such a high casting speed is achieved with a new design of the extruding screws, optimised casting parameters and independent screw drives.

Similar to its predecessors, the Extruder E9 is based on shear compaction technology. Efficient compaction allows for minimum cement content in slabs, because the high density of concrete has an exponential effect on the slab strength.

Independent screw driving not only increases casting speed, but also enhances the versatility of the product range for the Extruder E9. Elematic said that for years, there has been a growing demand for casting different products fast with one machine and the new Extruder is designed to fulfil this need.



ALL IMAGES: The Modifier E9 (top) and Extruder E9 (above) working together (below) in hollow-core slab production.



The Extruder E9 features a second-generation automatic compaction control system with the resistance of levelling beam as a new additional input parameter. Together with the independent use of the casting screws it guarantees a balanced casting process, as concrete is fed more evenly throughout the entire slab cross section. The casting process is monitored and controlled better, leading to improved slab quality.

The Extruder E9 is also equipped with an intelligent bouncing prevention system for stopping the pressure fluctuation during compaction from causing waves to the slab surface. Thus, slab surface will remain smooth and even. The Extruder E9 has a slow speed casting mode as well, reducing the need to stop casting when concrete supply to the machine is restricted. Less stops in the process results in better slab quality.

What's more, the Extruder E9 comes with an option for a smart, environment-friendly recycling system that decreases concrete consumption and lowers production costs. Once the recycled concrete is transported back into the Extruder, the system slowly mixes it with the fresh concrete to ensure that the mix quality remains on the defined high level. ■

Website: www.elematic.com

VOLVO

Volvo Construction Equipment (Volvo CE) unveiled two zero-emissions models – the ECR25 excavator and L25 wheel loader – from its new range of electric compact machines. They have been designed to deliver zero exhaust emissions, significantly lower noise levels, reduced energy costs, improved efficiency and less maintenance requirements, compared with their conventional counterparts.

From mid-2020, Volvo CE plans to start launching its range of electric compact excavators (EC15 to EC27) and wheel loaders (L20 to L28), stopping new diesel engine-based development of these models.

To make the ECR25 and L25 electric, their combustion engines have been replaced with lithium-ion batteries. The ECR25 is fitted with lithium-ion batteries and one electric motor which powers the hydraulics in order to move the machine and the attachment. The machine's batteries store enough electric energy to power the ECR25 for eight hours in its most common applications, such as utility work.

The L25 incorporates lithium-ion batteries that allow for eight hours of operation in the machine's regular applications, including light infrastructure work, gardening, landscaping and agriculture. This model also incorporates two dedicated electric motors, one for the drivetrain and one for the hydraulics. Decoupling the subsystems has led to higher efficiency in both the systems and the entire machine, said Volvo CE.

Both the ECR25 and L25 have onboard chargers that enable overnight charging via a regular household plug socket. A fast charging option, requiring more powerful grid access, will also be available.

According to Volvo CE, the launch of the ECR25 and L25 follow positive reactions to the company's concept models over the last few years. These include the prototype EX2 fully electric compact excavator and the prototype LX2 electric compact wheel loader. Now that the first compact electric machines have been launched, a number of units are expected to be used and tested by customers in pilot projects before production begins in mid-2020.

In addition, Volvo CE has developed the new EC300E Hybrid, which is now entering field testing. Unlike other systems that capture the swing energy of an excavator's superstructure to electrically assist the engine, Volvo's novel hydraulic hybrid harvests 'free' energy generated by the down motion of the excavator's boom and uses it to supercharge the hydraulic system.

The powerful and regular boom-down motions charge 20-l hydraulic accumulators, which then deliver energy to drive hydraulic assist motors that help power the hydraulic pump. There are the same levels of controllability and performance as the standard EC300E, including the ability to work in Eco mode and Hybrid mode simultaneously.

The EC300E Hybrid is said to deliver between 10-12% lower fuel consumption, up to 12% less CO₂ emissions – and all with no loss of performance. When used in production 'dig and dump' applications (especially those with a 90-degree swing) the payback of this simple approach can be a little more than a year, said Volvo CE. The machine provides the same levels of controllability and performance that users would expect from the equivalent conventional machine, and up to 17% fuel efficiency improvement dependent on application. ■

Website: www.volvoce.com



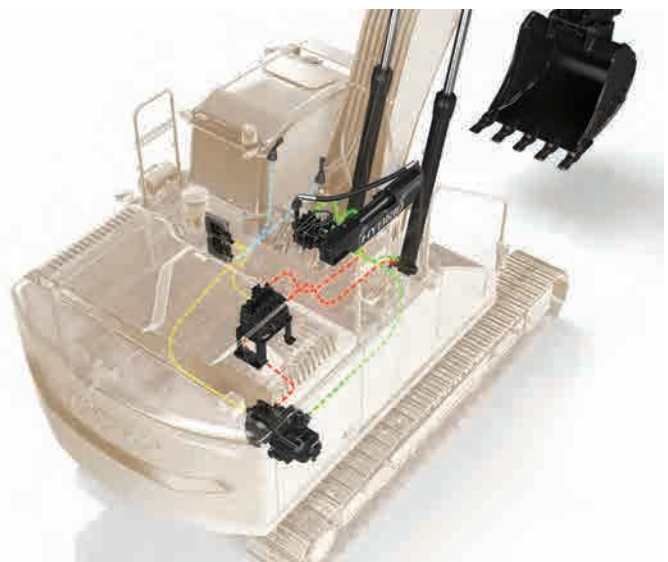
ABOVE: L25 electric wheel loader.



LEFT: ECR25 electric mini excavator.

BELOW: EC300E Hybrid excavator, which is currently entering field testing prior to its commercialisation.

BOTTOM: Volvo's novel hydraulic hybrid harvests 'free' energy generated by the down motion of the excavator's boom.



LIEBHERR

Liebherr introduced a new package solution for slurry wall applications - consisting of an LSC 8-18 slurry wall cutter, HS 8130.1 duty cycle crawler crane and a desanding unit - especially suitable for deployment in urban areas.

The LSC 8-18 can install slurry walls with thicknesses between 800 and 1,800 mm. The unit has a total height of 12 m and a low centre of gravity, providing better vertical positioning and excellent control. Bites with lengths of 2,800-3,200 mm and maximum depths of 110 m can be excavated with this slurry wall cutter.

Thanks to their quick installation system, the cutter wheels can be easily exchanged. Each cutter wheel is driven with 110 kNm, designed for demanding tasks. Due to the large diameters of the hoses in the 110 T hose drum system, high efficiency can be achieved in cutting application.

The HS 8130.1 crawler crane (as the carrier machine) maintains its multifunctionality and can also be used in grab operation or for lifting jobs. All control elements of the LSC 8-18 are fully integrated in the handling concept. Thus, a quick change between different applications is possible.

The LSC 8-18 is fitted with a hydraulic turning device, which enables the continuous alignment of the unit in the trench. Thus, all possible working positions can be covered. Twelve independently controllable steering flaps correct the cutting direction, and the actual position of the flaps is displayed in real time on the monitor in the operator cab.

The central lubrication system of the LSC 8-18 allows for quick and simple maintenance. An additional 500-l diesel tank in the hose drum carrier frame of the HS 8130.1 increases the total volume to 1,270 l and enables the longest possible self-sufficient operation.

In addition, Liebherr's new eight-axle all-terrain crane, the LTM 1650-8.1, is available with 54 m and 80 m telescopic booms. Customers can buy both lengths and change them easily, said the company.

The LTM 1650-8.1 travels with an axle load of 12 t, complete with its 54 m telescopic boom and the front supports. Liebherr said the crane can also be offered with a wide range of transport weights and axle load versions, to ensure cost-effective global mobility for axle loads both above and below 12 t.

The load capacity of the LTM 1650-8.1 has been increased by 15-50% compared with its predecessor (LTM 1500-8.1), depending on whether the telescopic boom includes guying or not. With a fixed lattice boom from 6 to 62 m in length, the telescopic boom can be extended easily. As an option, the fixed boom can be adjusted between 0° and 38°. The luffing lattice boom has a length of 21 to 91 m.

The LTM 1650-8.1 operates with a maximum ballast of 155 t. The ballast plates are compatible with the slabs from the LTM 1350-6.1, LTM 1400-7.1, LTM 1450-8.1, Liebherr's nine-axle mobile cranes and the LR 1350/1 crawler crane.

The LTM 1650-8.1 is powered by a Stage V engine, but it can be adapted to comply with other countries' emission standards, such Tier 4F for the US or Stage III for low regulated markets. In Eco mode, the complete pump drive can be disconnected automatically when the engine is idling and then reconnected by the intelligent controller when it is required.

Liebherr has also expanded its L1 series of fast-erecting crane with the new L1-32, featuring a 4-t maximum capacity. This model has a maximum radius of 30 m and still lifts 1,050 kg at the jib



head. It has a standard hook height of 21.3 m. With these features, the L1-32 is ideal for the construction of larger detached and semi-detached properties as well as smaller apartment blocks.

The L1-32 crane, with its low-speed axle and 5 t of basic ballast plus 10 t of additional ballast, can be transported to a site via a standard three-axle towing vehicle. Equipped with the Speed2Lift system, loads can be lifted in two-line operation with the help of a powerful FC hoist gear motor, meaning that reeving is not required. As a result, the crane can always be operated at a maximum hoist speed.

With the Micromove fine positioning mode, the operator is able to accurately and safely position heavy loads, like prefabricated concrete elements. Further functions such as the ABB operating-range limiting system, oscillation damping and wind force moment control ensure increased site safety. Added to this are comfort functions including radio remote control with colour display, which provides the crane operator with all relevant information at a glance. ■

FROM TOP:
Liebherr LTM 1650-8.1 all-terrain crane, L1-32 fast-erecting crane, and LSC 8-18 slurry wall cutter on the HS 8130.1 duty cycle crawler crane.



Website: www.liebherr.com

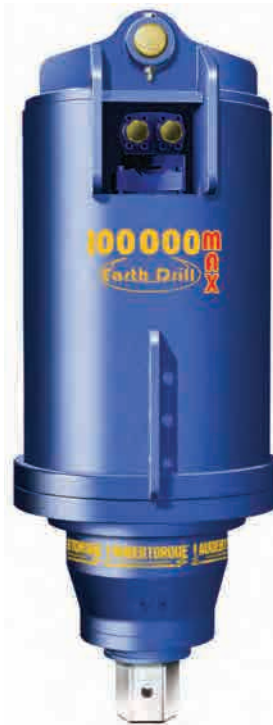
AUGER TORQUE

Two new earth drills have been unveiled to extend the current Auger Torque range. The 65,000MAX is suitable for excavators between 21 and 45 t, and the 100,000MAX for excavators up to 50 t. Both attachments are designed for excellent reliability, with the larger of the two geared towards high torque applications such as pre-augering, foundation piles, screw pile installations, deep hole engineering and well boring.

The 65,000MAX and 100,000MAX are equipped with powerful hydraulic motors and an innovative planetary gearbox, giving high efficiency and extreme durability. With forged hood ears, hood pins are locked for extra security making it impossible for the hood to detach from the hitch. As such, the earth drills can be used in the toughest conditions.

They also feature the non-dislodgement shaft (NDS), a single-piece drive shaft assembled top down and locked into the earth drill housing. This design guarantees that the shaft will never fall out, resulting in a safer work environment not only for the operator but also for the surrounding workers. ■

Website: www.augertorque.com.au



ABOVE AND LEFT: **Auger Torque 100,000MAX** earth drill is designed for excavators up to 50 t.

FAR LEFT AND BELOW LEFT: **Auger Torque** showcased its various new earth drills and other earthmoving attachments at bauma.

BELOW: **Equipment demonstration** by Kinshofer Group, Auger Torque's parent company.



SNORKEL

Snorkel introduced several product innovations. Among them was the new S3019E electric slab scissor lift, which made its global debut as a pre-production model. Customer orders for CE and ANSI units were available during bauma, and the lift is scheduled to be in full production by the fourth quarter of 2019.

The 5.79-m S3019E features a patent-pending design for its scissor stack, which stows completely inside the chassis. This enables a low step-in height, as well as a low stowed height, meaning that it does not require folding handrails to pass through doorways. Equipped with electric drive and electric steering, and capable of lifting up to 250 kg, the S3019E delivers long duty cycles and shares many features with the Snorkel line of hydraulic slab scissor lifts.

In addition, the first CE compliant Snorkel S3215L is now available to order globally, and shares many features with the Snorkel electric slab scissor lift family. This model was introduced to the North American market in 2018, as a lightweight yet robust electric slab scissor lift, designed for use in areas with low floor loadings. Delivering a platform height of up to 4.6 m, the S3215L has a lift capacity of 305 kg yet weighs just 952 kg with a floor loading at maximum capacity of just 951.9 kg/sq m.

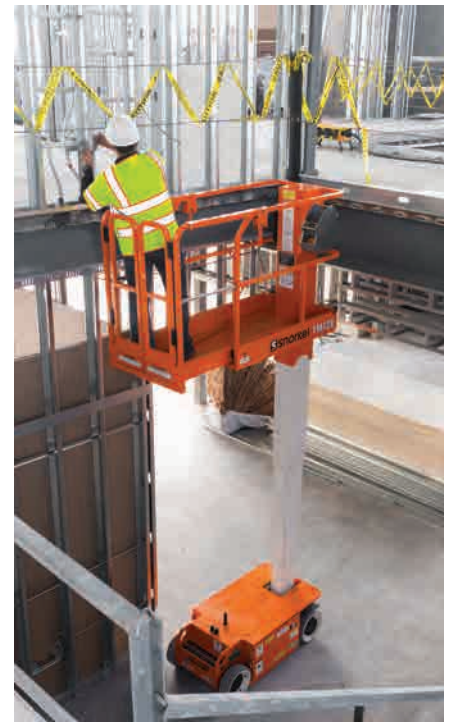
Snorkel also gave a preview of its lithium-ion powered electric Speed Level lift. Branded the Snorkel SL26E, the unit is aimed to deliver excellent four-wheel drive performance and 50% gradeability, just like its diesel-powered equivalent (the Snorkel SL26SL), as well as automatic self-levelling on slopes without the need for outriggers.

Two new rough terrain telehandlers, Snorkel SR1442 and SR1745, were also present. They are labelled as the SR9244 and SR1045 respectively in the Americas. Fitted as standard with four-wheel drive and enclosed cabs with heat and air conditioning, the SR1442 is capable of lifting up to 4,200 kg. It has a maximum lift height of up to 13.5 m and a maximum forward reach of up to 9.5 m. The larger SR1745 has a maximum lift height of up to 16.4 m, maximum forward reach of 12.6 m and can lift up to 4,535 kg.

The CE compliant TM12E and TM16E self-propelled telescopic masts marked their launch outside of North America. With platform heights of 3.65 m and



S3019E electric slab scissor lift.



TM12E self-propelled telescopic mast.



460SJ telescopic boom lift.



SR1745 telehandler.

4.87 m respectively, both the TM12E and TM16E feature a zero inside turning radius, and smooth and efficient electric drive for a long duty cycle.

Another highlight from Snorkel was the

CE compliant versions of its new mid-size telescopic boom lifts, the 14-m 460SJ and the 20.1-m 660SJ. They are now available to order with European Stage V engines. ■

Website: www.snorkellifts.com

CATERPILLAR

Among Caterpillar's highlights were its Next Generation mini hydraulic excavators in the 7- to 10-t category, the Cat 307.5 and 310. The 307.5 weighs from 7,532 to 8,233 kg depending upon configuration. It is a standard tail swing model with a fixed boom, powered by a Cat C2.4 turbo diesel engine rated at 41.7 net kW. Caterpillar said the machine can be ordered with a standard stick delivering a 4,107-mm dig depth, or a long stick that increases the depth by approximately 560 mm.

The 310 model weighs between 9,601 and 10,182 kg, equipped with a fixed boom, standard tail swing, and twin blade cylinders for handling heavy-duty dozing chores. This machine uses the Cat C3.3 diesel engine rated at 52.4 net kW and has a dig depth of 5,174 mm.

Both the 307.5 and 310 are fitted with cabs, sealed and pressurised to ensure a clean environment, and feature a redesigned heating/ventilating/air conditioning system that ensures all-weather climate control. The suspension seats offer a retractable wide seatbelt, and the operating consoles have adjustable wrist rests. In-cab sound levels are 72 dB(A).

Intuitive controls include the Next Generation LCD monitor that provide easy-to-read machine information and features a jog-dial for easy navigation, including setting personal operating preferences. For greater convenience, a control-pattern changer allows operators to quickly adapt the machine to their preferred joystick movement. A machine security system is available as key with pass code or push-to-start with fob. The machine can also be Bluetooth enabled through the radio.

The large front window slides upward and stores conveniently overhead, and expansive glass areas on the sides and rear of the cab, plus a skylight, provide all-around visibility. A rear-view camera can be integrated into the monitor.

An exclusive feature for new Next Generation models is the Cat stick steer system, which enables the operator to switch (with the touch of a button) from conventional lever/foot-pedal steering controls to low-effort joystick control. Automatic two-speed travel is standard, as is a cruise control system that further simplifies machine travel.

The cab's protective structures - ROPS (ISO 12117-2:2008), TOPS (ISO 12117:1997) and top guard (ISO 10262:1998 Level II) - are designed to promote a safe working environment for the operator, and controls are protected via a hydraulic lock-out. Halogen boom lights help illuminate the work area, and optional LED lights, front and rear, help to further enhance visibility. The easy-to-transport Next Generation models also feature tie-down points on the track frames to facilitate securing the machine.

These new mini excavators use an efficient, fuel-saving, load-sensing hydraulic system with an electronically controlled variable-displacement piston pump capable of oil flows up to 167 l/min (the 307.5) and 233 l/min (the 310). Generous flow rates, coupled with high main-relief pressures, provide the machines with the hydraulic capacity to generate increased travel performance, and higher digging and lifting forces, as well as to handle powered attachments.

For improved versatility, the auxiliary hydraulic system (complete with quick-disconnect lines) delivers one-way, two-way and continuous flow. Manual and hydraulic couplers are available, and the new models are available with a thumb-ready package and a certified lifting eye. Front-shovel operation, a capability that lends



Cat Next Generation 307.5 (above) and 310 mini hydraulic excavators.



an extra measure of precision when digging around utilities, can be accomplished with both pin-on and coupler-mounted buckets.

The 307.5 comes equipped with an undercarriage length of 2,880 mm, while the 310 has a longer undercarriage (3,301 mm), designed for higher stability. A dozer blade further expands the capability of the new models, allowing the machine to handle backfilling and grading tasks. The blade features ample travel, above and below ground, and has a float function. Major structures for the Next Generation mini machines - upper and lower frames, track frames, boom, and stick - are patterned after their larger Cat excavator counterparts and designed for long-term durability.

Routine maintenance check points are accessible at ground level through the side doors, and the battery is maintenance-free. Side panels are flat and recessed to protect them from damage and have been designed for easy replacement. ■

Website: www.caterpillar.com

LIUGONG

LiuGong's new 950 demolition excavator is suitable for heavy demolition applications. The machine has an operating weight of 64,320 kg, maximum working pin height of 30 m, maximum pin reach of 17 m and maximum attachment weight of 3,000 kg. Positive customer feedback focuses on the machine's improved stability and stronger 30-m-long reach boom, said LiuGong. The design of the attachment group also allows changing of standard equipment to high reach equipment and vice versa in 30 minutes or less.

Operator comfort and safety are top priority for this demolition excavator. The cab has been modified by replacing the front window screen with five-layer laminated glass, and the same modification has been applied to the roof glass. The front and roof glass are then butt joined to the front screen to give unsurpassed upward vision for the operator when working with the attachments. The ROPS/FOPS cab can be tilted and has a standard rear-view camera providing increased visibility.

The new LiuGong 909ECR excavator features an operating weight of 8,900 kg, maximum digging reach of 6,847 mm and maximum digging force of 63 kN. It is equipped with a Stage IIIB engine that delivers 44 kW (@ 2,200 rpm), and standard bucket capacity of 0.28 cu m. Being highly versatile, this compact radius machine can be fitted with a variety of attachments, ranging from buckets to hammers, in road and inner-city applications.

The new LiuGong 4180D motor grader offers 324° panoramic visibility owing to an innovative 5 post cab with a single C-pillar, a completely new cab interior that sets the benchmark for comfort and efficiency. New impact resistant materials have also been introduced for better weight distribution and increased recyclability. The machine has a blade width of 3,960 mm, operating weight of 15,500 kg, maximum drawbar pull of 84 kN and maximum travel speed of 42 km/hr.

LiuGong also showcased its new wheel loaders, including the 848H model with new Ergo transmission, offering an operating weight of 15,500 kg, breakout force of 129 kN, standard bucket capacity of 2.7 cu m and dump clearance of 2,840 mm. The 856H model has an operating weight of 21,200 kg, breakout force of 175 kN, dump clearance of 4,021 mm (side dump) / 2,894 mm, and bucket capacity of 2.5 cu m (side dump bucket). For jobs that require heavy lifting, the LiuGong 890H wheel loader comes in handy, featuring an operating weight of 30,800 kg, breakout force of 245 kN, dump clearance of 3,330 mm and bucket capacity ranging from 4.5 to 9 cu m.

In addition, Dressta introduced two crawler dozers. The TD-15 delivers maximum versatility through a wide range of frame structures and blades. It has an operating weight of 20,760 kg, maximum draw pull of 535.3 kN, blade capacity of 3.8 cu m (angle blade) to 5.95 cu m (semi-U), and maximum ripper penetration of 600 mm (multi-shank) to 762 mm (single-shank). New load sensing steering provides more precise blade and ripper control and reduces fuel consumption by up to 10%. The TD-15 also benefits from a new cab design that greatly improves operator comfort, safety and visibility with 30% more glass and rear-view cameras. Access for routine maintenance has been made easier to ensure the uptime and efficiency of the machine.

The other model, the TD-25, also features improved visibility and safety with 30% more glass in the cab and the inclusion of rear-view cameras. The machine offers an operating weight of 41,250 kg, maximum draw pull of 794 kN, blade capacity



LEFT:
LiuGong 950
demolition
excavator.

BELOW:
LiuGong 848H
wheel loader.

BOTTOM:
Dressta TD-15
crawler dozer.



of 9.6 cu m (semi-U) to 21 cu m (coal), and maximum ripper penetration of 760 mm (multi-shank) to 1,700 mm (deep single-shank). A new bogie undercarriage design gives comfort to the operator, especially on extreme rocky applications and still delivers excellent drawbar pull and productivity. The operator environment has also been improved within the pressurised cab. Special attention has been focused on the operational ergonomics to increase efficiency and reduce fatigue. Upgrades in the suspension and hydraulics further enhance the operator experience by minimising noise and vibration. ■

Website: www.liugong.com / www.dressta.com



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SENNEBOGEN

Part of the E-series, the Sennebogen 670 HD duty cycle crawler crane is designed for demanding applications. It has a maximum boom length of 56.9 m, plus auxiliary jib and fly boom as options. Three motorisation variants are available, including 298 kW in the Stage IIIA version, and 261 kW or 321 kW in the Stage V version.

The 70-t crawler crane features robust construction, multi-circuit hydraulic system and strong slewing drive, making it perfectly suited to special excavation work. Applications with leaders or diaphragm wall grabs with a bucket capacity of up to 2.5 cu m can be performed as reliably as operation of hydraulic piping machines with rope grabs for well excavation and special foundation work.

Equipped with a double shell grab or dragline bucket, the 670 HD is also suitable for hydraulic engineering and mining applications. Here, two 16-t freefall winches enable optimal pulling force. These winches are available in the heavy-duty 20-t version as an option.

The compact 670 HD is an ideal solution for use in confined areas. It can be ready for operation within a short time, said Sennebogen, and stands firmly and securely on its 700 mm three-grouser base plates thanks to the telescopic crawler chassis. The crane's compact dimension and simple ballast mounting system allows for easy transportation between jobsites. When its crawler undercarriage is fully retracted, the crane is just 3 m wide.

The Maxcab comfort cab provides an ergonomic work environment. It can be offered with 15-degree tilt or 2.70 m elevation to allow better visibility.

Another E-series duty cycle crawler crane - Sennebogen 6100 E with a 100 t capacity - is suitable for a wide range of tasks, from special foundation work and mining to soil compaction and dropball and demolition applications. It is powered by a 451 kW Stage V engine, but a 447 kW Stage III engine is also available.

Applications with leaders or diaphragm wall grabs can be carried out as well as operation of hydraulic piping machines

with rope grabs for well excavation and special excavation work. Here, two standard 20-t freefall winches provide excellent traction. These winches are available in heavy-duty 27.5 t and 30 t versions as an option.

The 6100 E features reliable winch synchronisation and can also be equipped with special control technology for automated free-fall operation for dynamic soil compaction. The telescopic crawler undercarriage with removable tracks helps reduce the machine's transport weight to less than 40 t. ■

Website: www.sennebogen.com



Sennebogen 6100 E (left) and 670 HD duty cycle crawler cranes.



ADVERTISERS' INDEX

ACCESS SYSTEMS TECHNOLOGY	67	IMER ORU	25
AMMANN	9	INDECO	31
ASIA INFRASTRUCTURE 2020	93	INTERMAT ASEAN 2019	85
ASTEC	OBC	JP NELSON	27
AUGER TORQUE	21	KOBELCO	GATEFOLD
BICES 2019	2	KOMATSU	39
BROKK	79	KONSTRUKSI INDONESIA 2019	89
CAMBUILD 2019	81	LINK-BELT	11
CATERPILLAR	23	LIUGONG	13
CHEMGROUT	69	MAEDA SEISAKUSHO	33
COMANSA	3	MAPEI	65
CONEXPO-CON/AGG 2020	6	MBAM ONEBUILD 2019	87
DOKA	77	METALGALANTE	35
ELEMATIC	75	MYANBUILD 2019	91
EVONIK	45	ROCKMORE	47
FOUNDATION ASSOCIATES	1	SANDVIK	IFC
GCP	15	TRIMAX MACHINERY	43
GENERAC	37	VERMEER	19
GEOKON	51	VOLVO	29
GOLDHOFER	71	WIRTGEN	7
HAULOTTE	73	WORLD OF CONCRETE 2020	4
HYDRONIX	41	XCMG	5
HYUNDAI	IBC	ZHEJIANG DINGLI	17
IBEW 2019	83		

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