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MAY - JUNE 2019

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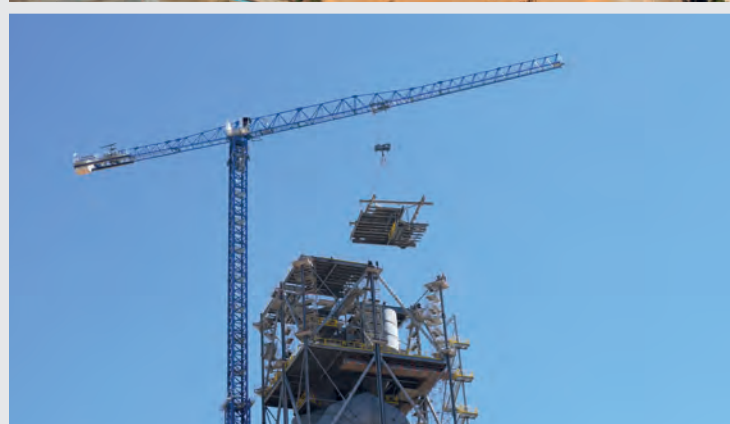


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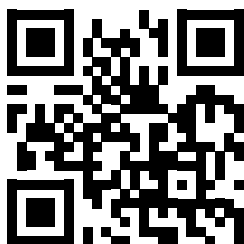
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# Vietnam to build National Innovation Centre

Arup and Boston Consulting Group (BCG) have been selected as consultant partners for the new National Innovation Centre (NIC) development in Hanoi, Vietnam. Both companies were recently invited by Vietnamese Minister of Planning and Investment Nguyen Chi Dung to present their vision to the Prime Minister Nguyen Xuan Phuc. This is a core initiative of Vietnam's innovation blueprint to fuel its new Industry 4.0 growth.

The meeting, which took place on 4 March 2019, was also joined by the Deputy Prime Minister Vu Duc Dam, other ministers and cross-sector industry leaders at the Prime Minister's Office.

NIC, the first of its kind in Vietnam, is set to be the powerhouse of the country's Industry 4.0 era. Located in Hanoi's Hoa Lac Hi-Tech Park, it will have a nominal GFA of 82,000 sq m on a 9-ha site in the first phase, followed by a mixed-use development in the second phase on the remaining 14-ha plot.

With an initial focus on smart factories, digital content, network security, smart urban areas and environmental technology, the centre is expected to attract large technology companies, start-ups and SME, venture investment funds and create thousands of jobs – developing a complete innovation ecosystem for carrying out the national economic reform.

"With Arup's long-term presence and multidisciplinary expertise in Southeast Asia, we are proud to advise and take part in formulating Vietnam's innovation plans. We look forward to further collaborations in sustaining the impressive economic growth of the country and the region," said Karma Barfungpa,



Both images © Arup



**ABOVE AND LEFT:** The new National Innovation Centre (NIC) is expected to become the facilitator for promoting Vietnam's Industry 4.0 development.

Arup's director of architecture and architecture leader for East Asia. The project is set to break ground in 2019 and expected to be delivered in a fast track delivery process. ■

# Taiwan starts construction of Danjiang Bridge

Construction work has begun on the 920-m Danjiang Bridge in Taiwan. It is believed to be the world's longest single-mast, asymmetric cable-stayed bridge. Spanning the mouth of the Tamsui River that flows through Taipei, the project is integral to the infrastructure upgrading programme of northern Taiwan. It aims to reduce throughtraffic on congested local roads by linking Highway 2 on the river's eastern side with Highway 15, the West Coast Expressway (Route 61) and the BaliXindian Expressway (Route 64) on the western side.

In reducing traffic by 30% on the existing Guandu Bridge 5-km upriver, the new Danjiang Bridge will significantly improve Taiwan's northern coast traffic network and also enhance accessibility throughout the region with the Port of Taipei and Taoyuan International Airport.

The bridge is said to minimise its visual impact by using a single concrete mast to support its main 450-m span with dedicated road, cycle and pedestrian lanes. The design also accommodates future expansion of the Danhai Light Rail network across the Tamsui River.

A Sinotech Engineering Consultants and Leonhardt, André and Partner joint venture with Zaha Hadid Architects, the bridge's 200-m mast is engineered to be as slender as possible.

Positioned to optimise structural performance as well as views of the setting sun from popular viewing points along the riverbank, the mast's location also avoids impeding the navigability of the river, explained Zaha Hadid Architects. This single-mast design minimises disruption to the riverbed in accordance with the

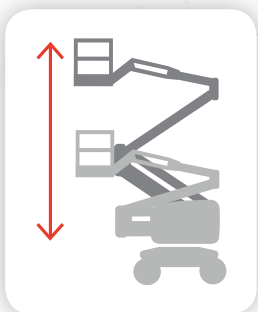


**Danjiang Bridge by Zaha Hadid Architects, render by MIR.**

enhanced protection programmes of the Tamsui River estuary's ecosystem as a nature reserve.

When completed, Danjiang Bridge is expected to reduce the journey between Bali and Tamsui on either side of the river by 15 km, saving 25 minutes of travelling time for those crossing the river. With a construction schedule of 68 months and budget of NT\$12.49 billion (US\$405.2 million), the new bridge is scheduled to open in 2024. ■

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# Dusit and CPN reveal new mixed-use project in Bangkok

Thailand's property developers Dusit Thani Public Company Limited and Central Pattana Public Company Limited (CPN) have formed a joint venture, Vimarn Suriya Company Limited, to build a new mixed-use development in Bangkok. Called Dusit Central Park, it is expected to be completed in 2024.

Totalling 36.7 billion baht and covering 440,000 sq m of prime site on the corner of Silom and Rama IV roads, this ambitious project will offer residences, an office tower, a shopping complex with a rooftop park, and the Dusit Thani Bangkok hotel - Dusit's iconic flagship property.

The project is planned to open in three phases, with the first one being the Dusit Thani Bangkok hotel. It will feature 39 storeys and a modern-yet-familiar design that incorporates significant elements from the original hotel.

The second phase will be the 90,000 sq m Central Park Offices, and also the Central Park shopping complex with a rooftop park. These two elements are scheduled for completion in 2023. The final part of the project will be the 69-storey residences. This tower will be divided into two sections - Dusit Residences and Dusit Parkside.

The appointed project architect is Dragon Holding Company Limited with OMA Asia (Hong Kong) – as the main consultant - working in collaboration with Architect 49 International. The project's structural design will be carried out by Aurecon Consulting (Thailand), while the building engineer is MITR Technical Consultant.

"We aim to deliver a one-of-a-kind mixed-use project that blends heritage and innovation, connects all important infrastructure and transportation, embraces a green concept reflecting our prime position opposite Lumpini Park, and delivers enduring value for all our stakeholders," said Suphaje Suthumpun, group chief executive of Dusit Thani Public Company Limited.



ABOVE AND LEFT:  
The new Dusit Central Park in Bangkok is expected to be completed in 2024. It will offer residences, an office tower, a shopping complex with a rooftop park, and the Dusit Thani Bangkok hotel.

Wallaya Chirathivat, deputy CEO of Central Pattana Plc added, "Ultimately, Dusit Central Park will connect four Bangkok neighbourhoods in four directions - namely Ratchaprasong (north), Charoenkrung (south), Sukhumvit (east) and Yaowarat (west). The project will be perfectly positioned to help bring Bangkok to a whole new level and set the standard for mixed-use projects in the city." ■

## Construction of Metro Manila Subway begins

Construction of the Philippines' first underground railway system - Metro Manila Subway - has recently started. It will comprise 15 stations from Quirino Highway in Quezon City to Ninoy Aquino International Airport (NAIA) Terminal 3 in Pasay and FTI in Taguig, all connected through a 36-km rail line.

Metro Manila Subway is deemed one of the most ambitious and monumental infrastructure projects under the Duterte administration's 'Build, Build, Build' programme. According to the Department of Transportation (DOTr), this new railway system will run at 80 km/hr, crossing seven local governments and passing through three of Metro Manila's business districts in just 30 minutes.

Guided by Japan's expertise in railways, the project will feature technological advancements and disaster-resilient strategies aimed to boost the Subway's structural integrity amid regular occurrence of typhoons and earthquakes, said the DOTr.

The project is expected to commence partial operations by 2022 for its first three stations (Quirino Highway – Mindanao Avenue Station, Tandang Sora Station and North Avenue Station), while the entire rail line is scheduled to be fully operational by

2025. It is intended to serve 370,000 passengers daily in its first year of full operations, with a design capacity that can accommodate up to 1.5 million passengers per day.

The DOTr has signed the contract for the design and build of the Partial Operability Section with the joint venture of Shimizu Corporation, Fujita Corporation, Takenaka Civil Engineering Co Ltd and EEI Corporation. The Partial Operability Section includes the first three stations, the depot in Valenzuela, and structures for the Philippine Railway Institute (PRI) that will be the primary policy-making body for the Subway.

The DOTr further highlighted that each subway station will feature an intermodal facility that will make transfers to and from road-based transport seamless and convenient. The Subway will also be connected with other major rail lines, such as the PNR Clark, PNR Calamba and the Common Station, to ensure interconnectivity, intermodality and interoperability.

The construction of Metro Manila Subway is a collaborative effort with the Japanese government through a PhP 365-billion Official Development Assistance (ODA) loan from the Japan International Cooperation Agency (JICA). ■



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# Indonesia's first MRT line commences operation

PT. Mass Rapid Transit Jakarta has started operations of the North-South Line of the Jakarta Mass Rapid Transit (MRT) system, Indonesia's first subway line. It features a length of 15.7 km - 9.2 km elevated and 6.5 km underground - running between Lebak Bulus in southern Jakarta and Bundaran Hotel Indonesia in central Jakarta. There are 13 stations in total, including seven aboveground and six underground. The line is projected to be able to accommodate up to 410,000 passengers per day by 2020.

The consortium comprising Mitsui & Co Ltd, Toyo Engineering Corporation, Kobe Steel Ltd (Kobelco), and PT. Inti Karya Persada Teknik (IKPT) was awarded the contract for the line.

Mitsui took the role of consortium leader for this project, and Toyo was responsible for project management as well as designing and supplying the substation system, power distribution system, overhead contact system, trackwork, escalators and elevators.

Kobelco was in charge of system integration and also designing and supplying the signalling and communications system, automatic fare collection system, and platform screen doors; while IKPT was responsible for the installation of all the systems and the supply of some of the equipment.

The project aims to mitigate the severe traffic congestion in Jakarta, as well as provide key infrastructure that will improve the



Jakarta MRT - the first subway line in Indonesia - has begun its operation.

investment environment. Indonesian President Joko Widodo has been actively supporting the development of the project, which is supported by the Japanese government with an ODA loan under Special Terms for Economic Partnership (STEP). There are also future plans to further extend the project and construct a new East-West Line. ■

## Surbana Jurong and AeroLion Technologies team up for UAV technology

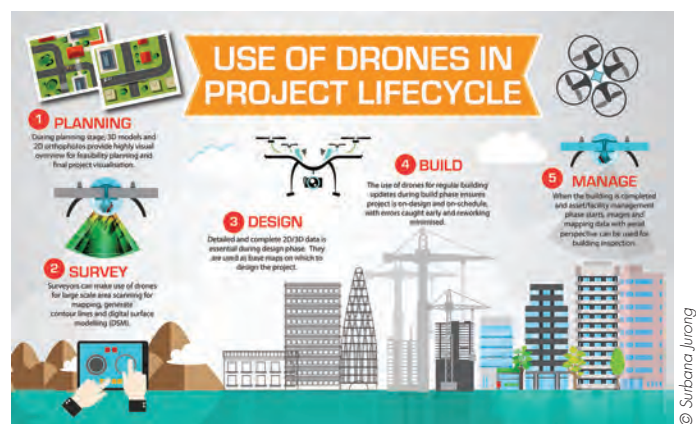
Surbana Jurong and AeroLion Technologies have signed a Memorandum of Understanding (MOU) to further develop unmanned aerial vehicle (UAV) technologies for the built and natural environment. Under the agreement, both companies will jointly develop UAV solutions for various project applications, including land reclamation, workplace safety, site progression and fault detection in enclosed areas such as buildings and tunnels.

Surbana Jurong aims to integrate these UAV solutions into its current processes to further increase its productivity. At the same time, combining real-world data from Surbana Jurong's operations with the UAV's artificial intelligence platforms will allow the company to offer advance data-driven UAV solutions to its global clients.

The partnership brings together Surbana Jurong's expertise and experience in planning, design and engineering in the global urban and infrastructure sectors, with AeroLion Technologies' expertise in UAV technologies that are focused on the building and construction sector.

UAVs are widely known as one of several technologies transforming the engineering and construction industry. Its use not only boosts productivity, but also reduces overall project time and costs, provides more accurate data readings in shorter time and improves worker safety.

Surbana Jurong said it has a dedicated Digital Management Office to drive technology applications throughout the Group. "Surbana Jurong already uses UAVs as part of our project processes, from conducting inspections and surveillance, high-precision data collection as well as security-led activities by our subsidiary AETOS. Our collaboration with AeroLion Technologies will further ensure our leadership in the area of UAV applications," said Wong Heang Fine, group CEO of Surbana Jurong.



Examples of how Surbana Jurong leverages UAV technology in its projects.

AeroLion Technologies specialises in the application of UAV in infrastructure inspection and warehouse management. The company has strong foundations in Artificial Intelligence (AI), UAV automation and advanced flight operations, and is slated to launch novel solutions for the built environment, following the success of its recent autonomous tunnel inspection UAV platforms.

Dr Wang Fei, CEO of AeroLion Technologies said, "At AeroLion Technologies, we always offer users a holistic solution that can benefit them in all areas. We develop entire UAV hardware and software for different needs as well as carry out class leading flight operations using existing UAV technology. By collaborating with Surbana Jurong, we aim to share our UAV expertise in the built environment while learning from one of the best in this industry." ■

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5m-22m  
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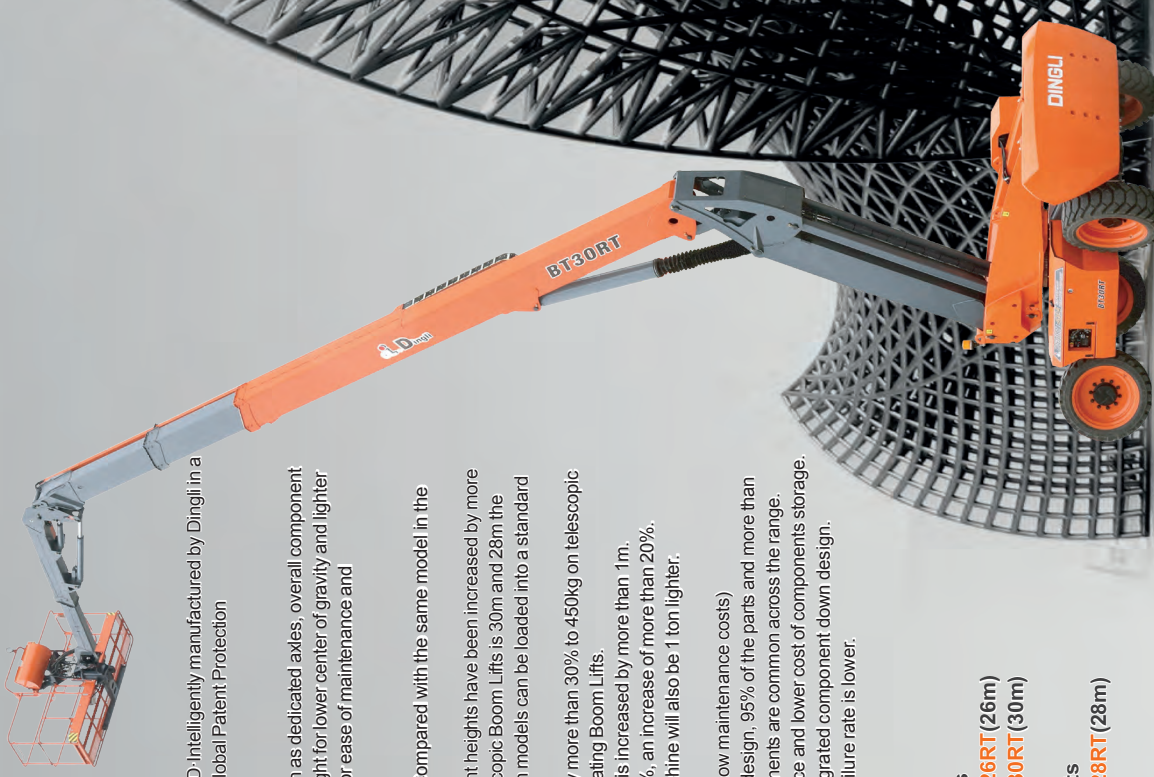


12m-22m  
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### Disruptive Design

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### Disruptive Innovation

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Maximum SWL increased by more than 30% to 450kg on telescopic booms and 320Kg on articulating Boom Lifts.

Maximum Horizontal Reach is increased by more than 1m.

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### Disruptive Maintenance (Low maintenance costs)

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More convenient maintenance and lower cost of components storage.

Simple to maintain with integrated component down design.

With dedicated axles, the failure rate is lower.

### Telescopic Boom Lifts

BT24RT (24m) BT26RT (26m)

BT28RT (28m) BT30RT (30m)

### Articulating Boom Lifts

BA24RT (24m) BA28RT (28m)

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## Meisterstadt Batam on track to complete first phase

The Meisterstadt Batam development in Indonesia has recently topped out its second residential tower. Once completed, the entire project will cover a land space of over 8.6 ha comprising an 860,000-sq-ft mega-mall (Pollux Mall Batam), eight residential towers, a hotel, a hospital and a 350-m-high office building featuring 100 storeys.

The developer, Pollux Habibie International, intends to complete the construction of four residential towers - known as the Wunderbar Residences - and a portion of Pollux Mall Batam by this year, as the first phase of the Meisterstadt Batam project. By the second quarter of 2020, visitors are expected to be able to visit the mall.

"After Phase 1, we look forward to unveiling more groundbreaking constructions that will become iconic landmarks of the Batam skyline," said Ilham Habibie, president commissioner of Pollux Habibie International. According to the developer, residents who purchased units in the first two towers of the Wunderbar Residences can also look forward to moving in next year. ■



ABOVE AND LEFT: Indonesia's Meisterstadt Batam project has recently topped out its second residential tower. Once completed, it will comprise a mega mall, eight residential towers, a hotel, a hospital and an office building.

## Philippines gets new Potain MCT 205 cranes

General contractor Whiteport has purchased two new Potain MCT 205 tower cranes, both of which will be used in various projects around Manila, the Philippines.

"Prior to these latest deliveries, we had nine Potain cranes in our fleet which have performed exceptionally well over the years. This gave us the confidence to invest in these two MCT 205 units," said Arthur Loscano, assistant vice president for equipment at Whiteport.

"Also, their topless design means they are better suited to the height requirements of projects close to Ninoy Aquino International Airport and are perfect for sites where overlapping cranes are required."

The MCT 205 is a topless tower crane with a maximum capacity of 10 t and up to 65 m of jib, while it can lift 1.75 t at its maximum jib end. Whiteport's nine other Potain cranes include MC 205, MCR 160 and MCR 225 A units. The company has built high-rise luxury developments, five-star hotels, churches and smart buildings across the Philippines. ■



Whiteport has bought Potain MCT 205 tower cranes for use in a range of projects around Manila, the Philippines.

## Work starts on Vietnam F1 Grand Prix circuit

Construction of Hanoi Motor Sport Circuit has recently commenced, in preparation for the Vietnam Grand Prix to be held in April 2020 - the country's first ever F1 race. It is located on the western side of the city, close to the My Dinh National Stadium.

The Hanoi track is set to become the fourth street race on the F1 calendar next year, after Monaco, Singapore and Azerbaijan. It will also be the fourth F1 race in Asia, joining China, Japan and Singapore.

Designed by Tilke Engineers & Architects, alongside F1's own Motorsports team, the circuit will feature 5.565-km long with 22 corners. It is expected to become one of the most challenging tracks in F1, with one of the longest straights in the sport at 1.5 km.

According to F1, the goal was "to create a unique hybrid layout, combining a street circuit's characteristics with a permanent countryside track layout within the confines of the city's topography. The circuit features a range of corners from a slow-speed hairpin and technical slow-to medium-speed corner combinations to high-speed esses and flat-out corners and long straights - one of which is 1.5 km in length, with expected speeds of 335 km/hr through the speed trap."

The announcement of Vietnam 2020 Grand Prix was made in November last year by Formula One (F1) and the City of Hanoi. At the same time, Hanoi promoter - Vietnam-based company Vingroup - was reported to have signed a multi-year deal to host the Grand Prix. ■

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## Haulotte strengthens in Japan with new subsidiary

Haulotte has established its new subsidiary in Japan, which had been previously operating as a branch office since March 2015. Based in Osaka, this new facility will now operate as a global solutions provider, including supplying an increased stock of spare parts, in order to shorten the lead-time for maintenance and repairs. The Japanese team will also focus on improving communications with its customers through regular face-to-face meetings and seminars.

In line with the Group's worldwide policy of tapping into deep local market knowledge, Haulotte Japan plans to work with local partners to help all parties grow their businesses. An increased staff strength, which includes a highly experienced French engineer, is also expected to help Haulotte Japan better serve and broaden its customer base while seeking new and emerging market opportunities.

The establishment of Haulotte Japan complements the Group's footprint in China and Singapore, and is a key part of its ongoing expansion plans in Asia.

Haulotte's ties with Japan commenced more than nine years ago, when it first supplied the Star 10 vertical mast, followed by a series of electric scissors. Over the past two years, it has sold medium to large articulating booms, primarily to customers in the construction and shipyard industries. Haulotte said that it is currently the market leader in Japan for articulating booms.

The opening of Haulotte Japan office was recently celebrated together with the Group's rental partner in Japan, Nishio Rent All Co Ltd. ■



Haulotte celebrates the opening of its new subsidiary in Japan.

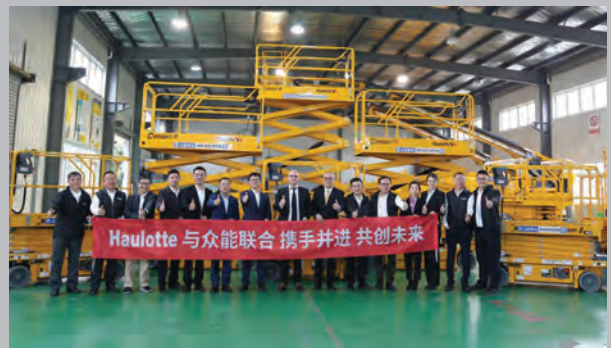
## Haulotte partners with China's Zhongneng United

Haulotte China and Zhongneng United Digital Technology Co Ltd have signed a strategic cooperation agreement, focusing on electric scissor lifts. The two companies will work together to drive the development of China's aerial work platform (AWP) equipment rental and application market. They both aim at providing a comprehensive rental solution.

"The aerial work platform equipment rental market in China is still growing these years, with great room for development and imagination. The cooperation between the two sides will create greater value for the market and the industry," said Wang Zhijun, general manager of Haulotte China.

Yang Tianli, CEO of Zhongneng United added, "We believe in Haulotte's products and services, which have been proven by practice. We are very grateful to Haulotte for joining hands with us to seize the opportunity and push the construction rental and aerial work platform equipment market to develop more vigorously and healthily."

Zhongneng United specialises in AWP equipment rental. The company provides nearly thousands of units including scissor lifts, straight booms, articulating booms and spider lifts. It has established a complete marketing, service, warehousing and logistics network in 21 provinces and 32 cities across China. ■



Haulotte China and Zhongneng United Digital Technology have signed a strategic cooperation agreement, focusing on electric scissor lifts.

## Hong Kong expands use of cavern service reservoirs to free up land

The Water Supplies Department (WSD) of Hong Kong is considering to relocate the Diamond Hill Fresh Water and Salt Water Service Reservoirs (DHSRs) to caverns. Black & Veatch has been appointed by the WSD to investigate, design and supervise the construction of the caverns and the new DHSRs.

The main objective of the project is to release land for other beneficial uses while still providing a quality water supply to the local areas. A new fresh water service reservoir, a new salt water service reservoir and associated pumping stations will be constructed within the caverns to replace the existing installations.

"Enhancing land resources is critical to Hong Kong's success. Housing service reservoirs in caverns is a technically viable alternative that can increase land supply. By collaborating with WSD, we are able to address the key requirements of delivering a world-class facility," said Andy Kwok, managing director of Black & Veatch Hong Kong.

Black & Veatch will be involved in designing tunnels, caverns and associated works for the new DHSRs; optimising the water supply systems of the proposed service reservoirs; and decommissioning the existing DHSRs and pumping station. ■

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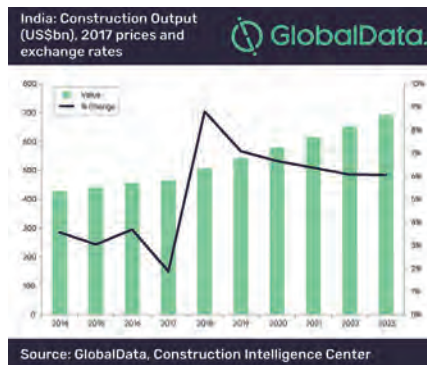
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# 'India's construction industry regains growth momentum'

Positive developments in economic conditions, improvement in investor confidence, and investments in transport infrastructure, energy and housing projects have helped the Indian construction industry regain growth momentum in 2018, with an output value increasing from US\$464.9 billion in 2017 to US\$505.7 billion, according to the data and analytics company GlobalData.

In its report titled 'Construction in India - Key Trends and Opportunities to 2023', the company reveals that India's construction industry - which registered an output growth of 8.8%, up from 1.9% in 2017 - is further expected to grow at a compounded annual average rate of 6.44% to US\$690.9 billion in 2023.

"India's construction industry is expected to continue to expand over the forecast period (2019–2023), driven by the government's efforts to develop the country's infrastructure and improve housing sector," said Dhananjay Sharma,



construction analyst at GlobalData.

The government's 'Housing for All' initiative – 'Pradhan Mantri Awas Yojana' (PMAY) - aims to build 20 million affordable houses for the urban poor by 2022. This will provide a significant boost to residential construction - the market's largest category - which will account for a third of the industry's total value by 2023.

In the 2018–2019 budget, the government increased its expenditure

towards infrastructure development by 20.9% from INR4.9 trillion (US\$75.9 billion) in the Financial Year (FY) 2017–2018 to INR6.0 trillion (US\$89.2 billion).

Residential construction is projected to remain the largest market over the forecast period, accounting for 30.1% of the industry's total value in 2023. The country's rising population, urbanisation and positive developments in regional economic conditions are also anticipated to create greater demand for residential construction over the forecast period.

Mr Sharma added, "GlobalData's latest estimate of India's total construction project pipeline including all mega projects with a value above US\$25 million, stands at INR82.5 trillion (US\$1.2 trillion). The pipeline, which includes all projects from pre-planning to execution, is skewed towards early-stage projects, with 60.7% of the pipeline value being in projects in the pre-planning and planning stages as of February 2019." ■

## Customised Terex tower cranes for Singapore



Crane World Asia has placed an order from Terex Cranes to manufacture 15 customised flat-top tower cranes for the Singapore market. The new Terex CTT 541-24 models (left) are specifically designed for the needs of contractors in the country, adhering to government regulations that restrict crane jobs from extending beyond a site's boundaries.

"The team at Terex listen to their distributors and customers' needs and are willing to produce

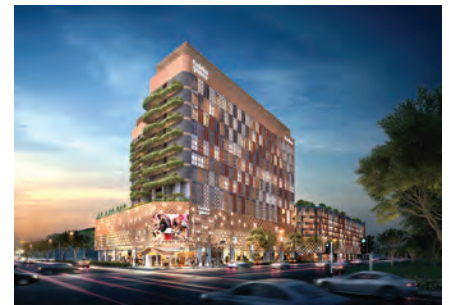
customised equipment to meet them. We know our customers appreciate their efforts," said Roger Poon, director at Crane World Asia.

The Terex CTT 541-24 has a compact counterjib that is only 16.5 m long and a maximum jib length of 55 m, while maximum freestanding height is 40 m to comply with local regulations. The crane's load chart has been engineered with input from Crane World Asia, so it can efficiently lift heavy loads into place, including prefabricated bathroom units that can weigh as much as 22 t and are commonly used when constructing residential flats.

In addition, Terex designed the CTT 541-24 crane to use H20 masts (instead of HD23 masts) as many companies in Singapore already have the smaller sized masts in their equipment inventory. "It's attention to details like this one that also helps reduce our expenses," added Mr Poon. "We don't have to invest in new mast sections to utilise these new cranes."

The new Terex CTT 541-24 flat top tower cranes are expected to be delivered in early 2019 and will be available through Crane World Asia. ■

## Tekka Place set to open in 2019



Tekka Place (above), a new hospitality-and-retail integrated development in Singapore, is in full swing and set for completion by the end of the year. This milestone was recently celebrated with a topping out ceremony.

The development comprises a 10-storey main block and seven-storey annex block with a rooftop deck. Construction work on the project, awarded by the Lum Chang-LaSalle joint venture to Lum Chang Building Contractors, commenced in mid-2017.

With structural works now concluded, the developers will focus on the architectural and services works of the development, in preparation for its opening in the fourth quarter of 2019. ■

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# Singapore integrated resorts plan for major expansions

Las Vegas Sands has announced a bold expansion plan for Marina Bay Sands Integrated Resort (IR) in Singapore. The company recently entered into an agreement with the Singapore government and plans to begin work on the new development soon.

Located immediately adjacent to the existing Marina Bay Sands IR, the main elements of the new development will be a state-of-the-art 15,000-seat arena, a luxury hotel tower and additional MICE (Meeting, Incentive, Convention and Exhibition) space.

The 15,000-seat arena is expected to play a key role in bringing new and repeat visitors to Singapore. The hotel tower, which will feature approximately 1,000 all-suite rooms, will also include a sky roof with a swimming pool and a signature restaurant.

According to Las Vegas Sands, Moshe Safdie (who designed the original property), Aedas and Gensler are planning to be part of the team responsible for the design elements of the building. The current total projected budget for the expansion is about US\$3.3 billion (S\$4.5 billion).

Since opening in 2010, Marina Bay Sands has reportedly attracted more than 330 million visitors. The property has brought over 700 new MICE events to Singapore since opening and hosted 3,680 events at the Sands Expo and Convention Centre in 2018 alone.



Marina Bay Sands IR will add a 15,000-seat arena, a luxury hotel tower and additional MICE space.

## Resorts World Sentosa

Singapore's Resorts World Sentosa (RWS) has also announced its S\$4.5 billion major expansion plans that will offer about 50% new gross floor area (GFA), adding over 164,000 sq m of new attractions, entertainment and lifestyle offerings.

The RWS 2.0 development is planned to be delivered in phases, with new opening every year from 2020 to a projected completion around 2025. After which, it will integrate with the transformation of the future Greater Southern Waterfront.

RWS revealed that both of its major attractions - Universal Studios Singapore and SEA Aquarium - will have substantial increase in size. The expansion of Universal Studios Singapore will unveil two new, highly themed and immersive environments based on hugely popular entertainment concepts - Minion Park and Super Nintendo World. The SEA Aquarium



A new waterfront lifestyle complex (top) and a Minion Park (above) will be built, as part of Resorts World Sentosa's major expansion.

will be expanded to more than three times its present size, and proposed to be rebranded as Singapore Oceanarium.

There will be a new waterfront lifestyle complex helmed by two new destination hotels, together with the expansion of Central Zone. According to RWS, the entire waterfront promenade will be completely renewed.

Replacing the Resorts World Theatre will be a new Adventure Dining Playhouse. In addition, a new driverless transport system will provide last-mile connectivity between the mainland and Sentosa with better efficiency and capacity. ■

## Skyjack expands into northwestern China

Skyjack has expanded into northwestern China with its first delivery to Shaanxi Shuntong Equipment Rental. The customer is a supplier of road machinery and aerial work equipment, whose rental products have worked on high profile projects throughout the region and it is now adding Skyjack's machines to its equipment lineup.

"Skyjack's reputation for reliable machines was brought forward to us from some of our partners and we're excited to place our first order with them," said Mr Yang, owner at Shaanxi Shuntong Equipment Rental. "A lot of the projects our customers work on are in tight spaces where having equipment that's easily manoeuvrable is critical to completing the job at hand."



Skyjack SJIII 4632 DC scissor lift has a maximum working height of 11.58 m and 204 kg capacity. It can lift and lower in under 60 seconds.

Shaanxi Shuntong Equipment Rental added Skyjack's SJIII 4632 DC scissor lift, which is driveable at full height and boasts

a maximum working height of 11.58 m, 204 kg capacity, and lifts and lowers in under 60 seconds. The electric scissor lift comes standard with a 1.22 m roll-out extension deck, which brings its overall platform length to 2.31 m.

"After meeting with Mr Yang, it was clear that increased uptime was a key consideration for their fleet, which is a perfect fit for Skyjack's simple and reliable philosophy," said Jack Dai, account manager of sales for Skyjack in Greater China. "We design our equipment to have all service points easily accessible should our customer, or the end user need it, and use off the shelf parts wherever we can to reduce turnaround time for our customers." ■



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# Singapore unveils Draft Master Plan 2019

The Urban Redevelopment Authority (URA) of Singapore has unveiled the Draft Master Plan 2019 (DMP19) for the country, which focuses on sustainable, green, inclusive neighbourhoods, rejuvenating familiar places and creating capacity for the future. The master plan proposes the key strategies that will guide Singapore's development over the next 10 to 15 years.

Future residential precincts in the country will continue to be sustainable, green, community-centric and car-lite, with easy access to a wide range of public spaces and amenities to meet residents' needs. The demand for facilities such as polyclinics, childcare and eldercare centres will evolve, said URA, as the demographic makeup of housing towns changes. As such, data analytics and geospatial capabilities are used to examine changing demographic trends, usage patterns, and user profiles to help agencies make decisions on where to locate new facilities, or convert existing ones to cater for new needs.

Singapore's island-wide network of play corridors, parks, sports facilities and green spaces will be expanded. In the future, over 90% of households are expected to be within walking distance of a park. More Active Beautiful, Clean (ABC) Waters projects are scheduled for completion over the next five years. Three major gateways in the west, north and east are being planned as well to support the country's economic growth, and bring jobs and amenities closer to homes.

Familiar places such as the Central Area, mature towns and major recreational corridors will be rejuvenated. There are also opportunities to inject unique, short-term uses for vacant State properties and land to bring about greater vibrancy and create public spaces.

Another highlight is that Singapore plans to free up surface land for people-centric uses by relocating utilities, transport, storage and industrial facilities underground. The country will tap on 3D technology to facilitate upfront planning of the underground space. It is rolling out 3D underground maps for Marina Bay, Jurong Innovation District and Punggol Digital District, to show the underground uses and planning requirements in these three pilot areas, and make them transparent to developers and building



© simschmidt/pixabay

Singapore has unveiled its Draft Master Plan 2019 that proposes the developments over the next 10 to 15 years, which also includes underground space.

owners. According to URA, this 3D underground plan will be expanded to include more areas in the future.

Singapore is also looking ahead for the longer term. The redevelopment of two key areas - Greater Southern Waterfront and Paya Lebar Air Base - will help the country meet its future growth needs.

The Greater Southern Waterfront spans across the southern coastline from Pasir Panjang to Marina East. In the future, after the City Terminals and Pasir Panjang Terminal relocate to Tuas, about 1,000 ha of land will be freed up for development. Together with other areas like Keppel Club and Sentosa, the total area of the Greater Southern Waterfront will be about 2,000 ha.

In addition, Paya Lebar Air Base will relocate and free up 800 ha of land. The site and its surroundings can be transformed into a highly liveable and sustainable new town, with new jobs and amenities for future residents. ■

Detailed information on the master plan is available online: [www.ura.gov.sg](http://www.ura.gov.sg)

## Terex MPS enters the Philippines with new distributor

Terex Minerals Processing Systems (MPS) has expanded into the Philippines with the appointment of Sunstate Machinery Corporation as its authorised distributor for the market. Sunstate is a subsidiary of the Kilton Motors Corporation Group, which has 19 subsidiaries.

"We are excited to expand our product offering to the Philippines crushing and screening market with the addition of the Terex MPS brand," said Gabriel Intengan, president and CEO of Sunstate Machinery Corporation. "Our success depends on providing our customers with innovative products, superior services and technical

support, and we are confident that by adding Terex MPS to our portfolio, we will be better able to meet these customer needs."

"I am delighted to have secured Sunstate Machinery Company as Terex MPS distributor for the Philippines. Sunstate Machinery Company has extensive knowledge and experience in sales and maintenance of equipment. Their trained specialists ensure they offer the best solutions and product support, which is why they are the right fit for Terex MPS," said Benjamin Tong, sales manager at Terex MPS. ■



FROM LEFT: Gabriel Intengan, president and CEO of Sunstate Machinery Corporation and Jaideep Shekhar, managing director for India, Southeast Asia and the Middle East at Terex Materials Processing.

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# Tunnelling works start on Singapore DTSS Phase 2

PUB, Singapore's national water agency, has commenced tunnelling works on the Deep Tunnel Sewerage System (DTSS) Phase 2. The first TBM on the project – called TBM Bahar, named after the Jalan Bahar jobsite where it will be lowered into a shaft - will create a 3.5-m-diameter tunnel 42 m below ground.

According to PUB, a total of 19 TBMs will be used for this project to dig at depths of between 35 and 55 m below ground and seabed, creating deep tunnels and link sewers that range from 3 to 6 m in diameter. More than 1.8 mil cu m of soil will be excavated during the tunnelling works.

## Innovative technologies

PUB said that it will pioneer the use of a Vertical Shaft Sinking Machine (VSM) to construct the shaft - a first for Asia. This method allows the shaft construction and excavation to be carried out simultaneously, as opposed to conventional methods that require the retaining wall to be installed before excavation can start. It is also believed to be safer, as all operations are controlled and monitored from the surface.

DTSS Phase 2 deep tunnels will employ other cutting edge technologies and advanced smart sensors at work, added PUB. Constructed using concrete resistant to microbiological-influenced corrosion and lined with High Density Polyethylene (HDPE) to further protect the concrete from the harmful sewer environment, the tunnel will come equipped with a waterproof membrane coating in sections where it goes under the seabed.

During tunnelling, PUB will also utilise a smart tunnel monitoring system known as Shaft and Tunnel Excavation System (STEMS) to act as the nerve centre to provide real-time updates of the TBM locations and instrumentation readings, ensuring safe and smooth operations throughout the construction period with minimal disruption to the structures in the immediate vicinity.

In addition, fibre optic sensors are embedded within the tunnel lining to monitor structural integrity and detecting problems before they become potential risks. The installation of isolation gates at strategic points of the deep tunnel allow for sections of the tunnel to be isolated in the event where used water flow diversion is required. To mitigate odour, forced ventilation equipment called 'air jumpers'



TOP AND ABOVE: The launch ceremony for the first TBM on DTSS Phase 2 marks the start of tunnelling works on the project.

will also be used in the operations of its air management system in the tunnels – this is said to be a first for Singapore.

The DTSS Phase 2 conveyance system will traverse 100 km across the western half of the island, including the downtown area as well as upcoming developments such as the Jurong Lake District, Tengah Town and the Greater Southern Waterfront.

Comprising 40 km of deep tunnels and 60 km of link sewers, works will be carried out through 18 contracts, including five design and build contracts for the deep tunnel that runs along the Ayer Rajah Expressway from Keppel Road to Tuas View Basin, and another 13 contracts for the link sewers. Tunnelling works are targeted to complete by 2024.

When completed, used water from homes, offices and industries will be conveyed via two tunnels - the 30-km-long South Tunnel (domestic use) and the 10-km Industrial Tunnel (industrial use) - to the Tuas Nexus for treatment and recycling into NEWater.

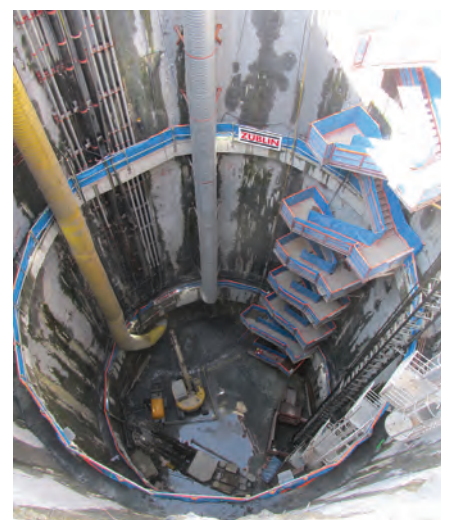
DTSS Phase 1, comprising the North and Spur Tunnels, the associated link sewers, the Changi WRP and outfall, was completed in 2008. Two NEWater factories, located on the rooftop of the Changi WRP, were officially opened in 2010 and 2017 to facilitate large-scale water recycling.



ABOVE: Woo Lai Lynn, chief engineer working on DTSS Phase 2.

LEFT: The first TBM for the project is named after the jobsite, Jalan Bahar.

BELOW: The TBM launch shaft.



The completed DTSS - an ambitious S\$10 billion infrastructure project first conceived 25 years ago - will boost PUB's capability to reclaim and recycle water in an endless cycle, thus greatly enhancing Singapore's water sustainability. ■

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Wirth Oktopus develops and produces vacuum lifting devices for construction site use and shop floor operation, enables efficient, ergonomic and safe handling of various materials.

# Saudi Arabia buys 'world's largest 3D construction printer'

Saudi Arabia-based construction company, Elite for Construction & Development Co, has placed an order from Danish company COBOD International for a BOD2 3D construction printer. The machine is expected to be delivered by the end of May 2019.

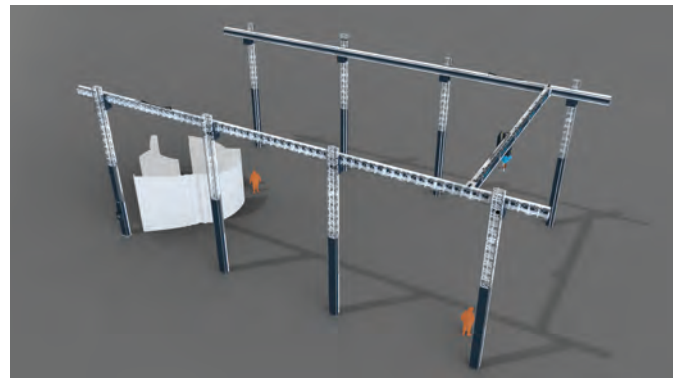
According to COBOD, it will be the biggest 3D construction printer in the world, which is able to print buildings of 12 m wide, 27 m long and 9 m high. Three-storey buildings of more than 300 sq m per storey can also be created with the printer in one go.

Elite for Construction & Development is said to have put the order as a response to Saudi Arabia's need for building 1.5 million private houses in the next 10 years and also in line with the country's Vision 2030, which aims to improve the economy and housing situation by applying more modern construction techniques. At the same time, leading private companies and public organisations have reportedly expressed a strong desire to use the 3D construction printing technology in construction projects if provided locally by a Saudi company.

COBOD said that in 2017, it made the first 3D printed building in Europe - the BOD (Building On Demand) - located in Copenhagen, Denmark. In 2018 the company continued its fast development by launching the BOD2, which is believed to be the only second generation 3D construction printer on the market.

Henrik Lund-Nielsen, CEO of COBOD International said, "We are very proud to receive this order from Saudi Arabia, which again confirms that our second generation BOD2 3D construction printer is second to none. Not only is the BOD2 the fastest 3D construction printer in the world, but the modular approach of the BOD2 allowed us to deliver the size that Elite For Construction & Development wanted, a printer capable of printing buildings of more than 300 sq m."

Saad Al Shathri, general manager of Elite for Construction & Development Co explained, "We will make this revolutionising technology available in all of the kingdom of Saudi Arabia. We will be able to carry out projects with our own crews and based on 3D printable concrete made locally. This will bring costs significantly down compared to temporary imported printers using foreign-made materials. With the 3D construction printing technology we will be able to do projects almost impossible with conventional technology, and we will build faster and cheaper than before. At the same time we decided to invest in a very large printer, such that the scope of projects we can carry out will be as big as possible."



Rendering of BOD2 3D construction printer that will be delivered to Elite for Construction & Development. Here, the printer is being compared to the size of the BOD, a 3D printed building in Copenhagen (in white colour) made by COBOD.



The BOD in Copenhagen is said to be Europe's first 3D printed building.



The BOD2 3D construction printer being tested before shipment.

Mr Lund-Nielsen added, "The sheer size of the new printer is impressive. This will by far be the biggest 3D construction printer ever made and with the printer, Elite For Construction & Development Co will be able to do construction projects previously unthinkable for a 3D construction printer. When compared to the BOD building we did, it is clear that Elite for Construction & Development Co is taking 3D construction printing into brand new territories. With this printer, they will be capable of gaining a leading position not only for the 3D construction printing of private houses, but also for medium-sized offices and public buildings like museums, schools, etc." ■

## Odunpazari Modern Museum to open in Turkey

Odunpazari Modern Museum (OMM), a new iconic museum in Turkey designed by Kengo Kuma and Associates (KKAA), is set to open in June 2019. Founded by Erol Tabanca, an art collector and businessman, OMM will welcome international visitors to explore its significant collection of modern and contemporary art spanning the 1950s to the present day. With its distinctive stacked timber design, the new 4,500 sq m building has three storeys. Located in Eskişehir, a university town in the northwest of Turkey, OMM draws inspiration from Odunpazari's traditional Ottoman wooden cantilevered houses that are synonymous with the district, and pays homage to the town's history as a thriving wood market. ■

RIGHT: An artist's impression of Odunpazari Modern Museum.



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# 'World's tallest wooden building' completed in Norway

The Mjøsa Tower in Brumunddal, Norway, recently opened its door. This 18-storey mixed-use development reaches up to 85.4 m high, which is believed to be the tallest wooden building in the world. It incorporates a hotel, private homes and office space. Here, Metsä Wood's fast, light and green Kerto LVL (laminated veneer lumber) products have been used in the intermediate floor elements of the building.

According to Metsä Wood, the Mjøsa Tower is proof that tall buildings can be built using wood, symbolising environment-friendly thinking in construction. The company explained that the structure is similar to conventional buildings, but the dimensions of the elements are much larger than usual. Both the structure and facade of the Mjøsa Tower are made of wood. The load-bearing structure consists of glulam columns, beams and diagonal members, which suit high-rise buildings. The first 10 storeys are made of prefabricated wooden elements. The decks on the upper floors are made of concrete, to restrain the building and keep it from swaying.

Metsä Wood said that the aim of the project was to build using sustainable, local wood products and local suppliers. Besides Norwegian glulam and CLT, the building makes use of Kerto LVL products delivered



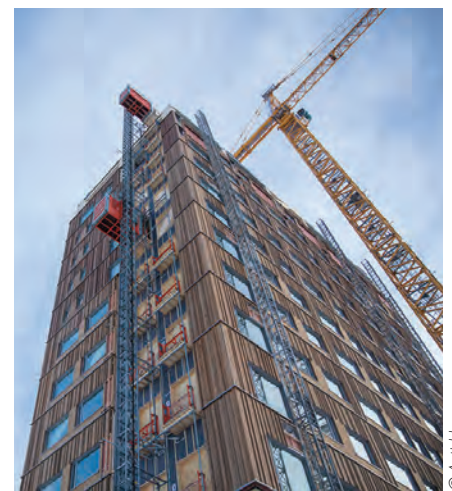
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ALL IMAGES: The new Mjøsa Tower in Norway uses Kerto LVL Q-panels in the floor elements. This 18-storey mixed-use development reaches up to 85.4 m high, which is believed to be the tallest wooden building in the world.



© Moelven AS

from Finland. Kerto LVL has been used as part of the floor elements manufactured by Moelven Limtre. It is said to be a superior material for the top plate and end beams, as it is lightweight and very straight, thus ensuring production without delays. ■



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## Hyundai to commercialise remote diagnostics service for excavators

Hyundai Construction Equipment (HCE) is set to commercialise its remote diagnostics service for excavator engines (Stage V), in partnership with the US-based global engine manufacturer Cummins. This service builds on HCE's remote management system Hi-Mate and Cummins' engine solutions to enable real-time diagnostics report of any failures in excavator engine parts and to offer troubleshooting guidelines.

The two companies entered into an MOU for joint technology development in early 2017. After about two years of collaboration, they recently succeeded in developing the remote engine diagnostics technology. HCE planned to produce diagnostics-ready excavators starting in March 2019.

As excavators might be used on jobsites that are far away from the city, it is useful for customers to access information on device failure and troubleshooting solutions from a distance; they will be able to prepare the necessary parts and equipment in advance, which would reduce the waiting time. Also, the customers can benefit from HCE's one-stop repair services.

Hi Mate is HCE's proprietary remote management system developed in 2008. It provides real-time information on the location and operational status of equipment via PC or apps.



HCE has signed an agreement with Cummins for cooperation on remote engine diagnostics service (Stage V).

HCE is also poised to build Smart Construction by 2020, following 5G-commercialisation at the end of last year. Smart Construction is a next-generation construction platform, which will be built by HCE in partnership with Korea's telecommunication service provider SK Telecom and the US-based measurement company Trimble. ■

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# XCMG to launch G-series cranes for global markets

China-based global manufacturer XCMG plans to launch a total of 84 new customised G-series cranes globally by the end of 2019, with 25 of them being designed for Southeast Asian, Middle Eastern and African markets.

“We are confident that our new line of cranes will achieve success in the Middle East, Africa and Southeast Asia,” said Liu Jiansen, assistant president of XCMG Machinery and general manager of XCMG Import and Export. XCMG’s cranes are very competitive globally, and the G1-generation models, developed per our ‘advanced and durable’ golden standard, are the best of the best.

“By leveraging the industry’s first G-technology platform, XCMG will make breakthroughs by adapting to clients’ needs with differentiated products and cutting-edge technologies. In the future, XCMG will not only be the world’s top mobile crane manufacturer, but also lead in comprehensive strength.”

According to XCMG, the new G-series of cranes was collaboratively designed by its researchers in Europe, North America, Brazil and China. The products are built to offer user-friendly design, featuring sustainable construction process and adaptability to varied and diverse environments.

XCMG further highlighted that in 2018, its hoisting machinery



XCMG is set to release 84 new G-series cranes globally by the end of 2019 - 25 of which are targeted at SE Asian, Middle Eastern and African markets.

business division saw a 33% year-on-year increase in overseas sales, which was far ahead of the industry’s average of 9.6%. The company added that its crane products have also achieved initial success in the high-end market, as exports to European and North American customers rose by 50% last year, with 30 XCA60E all-terrain cranes sold in Europe, and the XCA300U all-terrain crane making a successful debut in North America. ■

## Henrik Ager is new president for Sandvik Mining and Rock Technology



Henrik Ager (left) has been appointed as new president for Sandvik Mining and Rock Technology business area and member of the Sandvik Group executive management as of 1 April 2019. Succeeding Lars Engström, Mr Ager most recently served as president for Sandvik Rock Tools division.

“I’m convinced that Henrik Ager with his experience, already proven leadership skills and excellent performance in Sandvik has the right capabilities to lead Sandvik Mining and Rock Technology going forward,” said Björn Rosengren, Sandvik’s president and CEO. “Henrik is committed to further strengthening Sandvik Mining and Rock Technology’s market position, reinforcing customer relations, driving aftermarket sales, leveraging further on a decentralised way of working and ensuring our forefront position within automation, electrification and sustainability.”

Mr Ager has more than 16 years’ experience in the mining industry, out of which an extensive period has been spent living in South Africa. He has also worked in Australia, South America, India and other important mining markets.

Mr Ager’s previous experience from Sandvik includes the role as president for the Global Equipment division and vice president for strategy within Sandvik Mining and Rock Technology. He has also held leading positions at McKinsey, Ericsson and several high-tech start-ups prior to joining Sandvik in 2014. ■

## Link-Belt appoints new global product managers



Link-Belt Cranes has appointed two new global product managers. Brian Smoot (far left) is in charge of Link-Belt telescopic truck and all-terrain cranes, while Kelly Fiechter (left) is responsible for

Link-Belt rough terrain cranes. Both roles started on 1 April 2019.

Mr Smoot began his career at Link-Belt in 2007 as an associate product technician before moving into the product marketing group as marketing product specialist for HTC (telescopic truck) and ATC (all-terrain) cranes. He took on the role of product manager for rough terrain cranes in 2013.

Mr Smoot has overseen Link-Belt’s most recent rough terrain crane development, along with major technology advances such as V-Cal, Pulse and its second-generation version, Pulse 2.0.

“Brian’s previous responsibilities with hydraulic truck and all-terrain product lines, along with his most recent experience with Link-Belt’s rough terrain lineup, provide necessary knowledge for his new role,” said Pat Collins, director of product marketing at Link-Belt Cranes.

Mr Fiechter began his career with Link-Belt in 2000 as a product specialist for both lattice and telescopic boom products. He served as district sales manager since 2008, most recently covering the upper midwestern US and western Canada.

“Kelly’s field sales and product experience will be a valuable benefit to the entire marketing team as we look forward to his move from Minneapolis to the Bluegrass,” said Mr Collins. ■



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## Liebherr invests €5 mil for Generation 8 excavators

Liebherr-France SAS has invested €5 million in a new assembly line to manufacture the new Generation 8 crawler excavators. This new series was launched worldwide this year, comprising the R 922, R 924, R 926, R 930, R 934, R 938 and R 945 models.

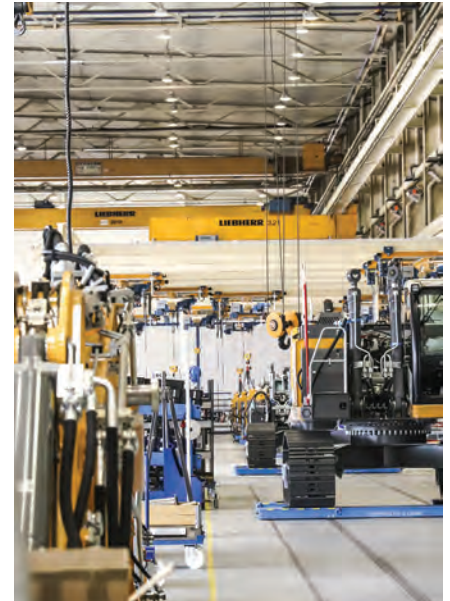
The new assembly line can achieve average cycle times of 155 minutes per station with an output of five excavators each day, said Liebherr. Altogether, the R3 assembly line has 26 work stations and nine preassembly stations synchronised with the main line.

With a workforce of over 1,500 employees and annual production of 2,000 machines, Liebherr-France based in Colmar is the main manufacturing facility for earthmoving crawler excavators within the Liebherr Group. The standard production range comprises around 30 crawler excavator models, from the R 914 Compact to the R 980 SME for earthmoving and mining applications.

Production at the facility also includes a large number of special machines for special work requirements, such as building demolition, material handling, maritime applications (pontoons) or tunnel construction, as well as electric excavators. The crawler excavators with an operating weight of 14 to 100 t are equipped with Liebherr engines with power of 90 to 420 kW. ■



The R 924 is one of the models in Liebherr Generation 8 series.



Liebherr-France SAS has invested €5 million in a new assembly line to manufacture the new Liebherr Generation 8 crawler excavators.

## Record year: Liebherr achieves over €10 bil in annual turnover

The Liebherr Group has notched up a turnover of €10,551 million in 2018, breaking through the €10 billion barrier for the first time in its history. This represents an increase of €739 million, or 7.5%, compared with the previous year.

Despite a slight decline in overall economic growth, 2018 was a record year for Liebherr. Both the construction machinery and mining equipment divisions recorded overall increases in sales revenues, as did the other product areas in general.

Revenues from construction machinery and mining equipment rose by 10.8% to €6,833 million, with strong contributions from the Earthmoving, Mobile Cranes and Mining divisions. In the other product areas, which include Maritime Cranes, Aerospace and Transportation Systems, Gear Technology and Automation Systems, Domestic Appliances, Components and Hotels divisions, turnover rose by a total of 2.0% to €3,718 million.

According to Liebherr, record sales generated in 2018 can be credited to the favourable economic conditions and higher demand in several sales regions. Sales continued to increase within the European Union, which is Liebherr's most important sales region. This can be attributed to, among other things, renewed growth in Germany - Liebherr's largest market - as well as the positive economic situation in France and Great Britain. In the non-EU countries, sales revenues fell in EUR terms compared to the previous year, primarily due to the development of the currency exchange rate in Russia. The business also performed positively in North America, Central and South America, and Asia and Oceania, driven in particular by the markets in the US, Australia and China.

Liebherr gained a net profit of €321 million in 2018, slightly above the previous year's level. The operating result remained stable compared to the previous year. The financial result declined, mainly due to negative effects of currency movements. At the end of 2018, Liebherr had a total of 46,169 employees worldwide. Compared to the previous year, this constituted an increase of 2,300.

In addition, Liebherr has invested €586 million in research and development last year. The bulk of this was used in the development of new products. A large number of joint research projects with universities, other higher education institutions and research institutes were initiated and continued. A special area of focus for this research project is the construction site of the future. For example, Liebherr started a development partnership with the RWTH Aachen within the framework of the Centre Construction Robotics and is also involved in the 'Construction 4.0' joint project initiated by the German Mechanical Engineering Industry Association (VDMA).

Liebherr also invested €829 million in the production sites and the global sales and service network. This means that the Group has increased its investment activities by €51 million compared to the previous year. Offset against this was depreciation of €513 million.

Based on the latest projections, global economic growth is expected to continue to slow during the current year. However, there are no signs of an imminent recession. Liebherr said that demand in most regions and industries may develop positively in 2019. Therefore, the Group expects sales revenues to continue to rise in 2019. ■

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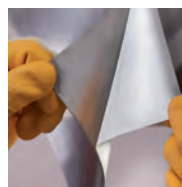
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# 'Global construction equipment sales hit record high'

Global construction equipment sales hit an all-time high of 1.1 million units in 2018, with a retail value of some US\$110 billion, according to Off-Highway Research. This eclipsed the most recent highs of 2011 – the peak of the Chinese stimulus spending boom – and 2007.

Continuing the trend seen in 2017, there was a widespread improvement in equipment sales around the world last year, with increases in North America, Europe and emerging Asia, including both China and India.

In China, sales of construction equipment including mobile cranes grew 37% in 2018. This followed on from the 81% surge seen in 2017, and took the market to 343,817 units. This was the highest Chinese equipment demand has been since 2012, revealed Off-Highway Research, and established the country once again as the largest market in the world.

India also had a remarkable year. Sales of construction equipment including mobile cranes grew 35%, the third successive year of robust growth. This took the market to a record high of 98,204 units – some 44% above the previous high seen in 2011, and more than double the demand seen just three years previously during the cyclical low point of 2014 and 2015.

Meanwhile, sales in Western Europe hit their highest for a decade in 2018, with a 10% rise to 177,694 units. Demand increased in 14 out of the region's 15 largest markets, with sales in Germany and the UK in particular reaching impressive levels. The only time the German market has been as strong was at the height of the post-reunification building boom in the early 1990s, said Off-Highway Research.

North American equipment sales also improved last year, with growth of 13% taking demand to some 195,500 units. The only disappointment among the world's largest markets last year was Japan, where sales fell 5% to 63,700 machines.

While 2018 is likely to represent the peak in the current cycle, Off-Highway Research forecast only a moderate decline in global demand this year. Sales are expected to remain above 1 million units, which would be only the fourth year in history this has been achieved.

The outlook for the following years is for demand to stay at good levels. However, Off-Highway Research warned that this bright outlook could be threatened by negative and unexpected political and economic events. ■

## Andreas Schell to continue leading Rolls-Royce Power Systems



Rolls-Royce Power Systems has extended the appointment of Andreas Schell (left) as its president and CEO, alongside CFO and HR director Marcus A. Wassenberg. Both of their contracts will last to December 2022.

"The board of directors at Rolls-Royce Power Systems (RRPS) has jointly stabilised business operations significantly over the past years to make this organisation fit for the future. The recently published figures

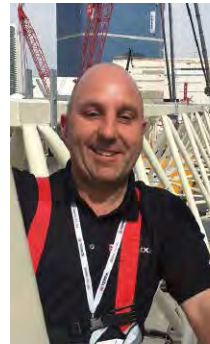
for fiscal 2018 are proof positive of this upturn," said Axel Arendt, chairman of the supervisory board. "In bringing the RRPS 2018 transformational change programme to a successful conclusion, management and workforce have laid the cornerstone for the PS 2030 Strategy. Initial successes are already clearly visible. We can now continue steadily on our charted course under the ongoing aligned direction of the board of management."

"The PS 2030 Strategy isn't intended to just have an impact in 10 years' time," commented Mr Schell. "We're already working ceaselessly – and successfully – on making the leap from engine manufacturer to turnkey solution provider."

"The PS 2030 strategy aims at remodelling our whole corporate culture to make jobs at Rolls-Royce Power Systems more digital, switched on and secure," added Mr Wassenberg. "Andreas Schell and I, myself, are here to manage a steady progression along the road to success for the benefit of the company and the people who work here. It is as challenging as exciting to take on our tasks jointly and in close cooperation with the Executive Leadership Team (ELT)."

Mr Schell has been on the board of Rolls-Royce Power Systems since January 2017, whilst Mr Wassenberg has held office at the company, best known for its core brand MTU, since January 2015. ■

## Terex Cranes appoints new global sales director for tower cranes



Lee Maynard (left) has been appointed as new global sales director for tower cranes at Terex Cranes. He was previously the company's director of sales for Europe & Russia in the mobile cranes business. He was also general manager for the UK and Ireland (UK&I) and will continue in this role until a successor is found.

Mr Maynard will be based in the Schaffhausen Terex Global office in Switzerland and in his new role, he will develop long-term strategies and identify growth opportunities in the global tower crane market with the objective of increasing the company's worldwide market share and profitability.

Mr Maynard will be taking over management duties for the global Terex tower cranes sales team in EMEAR (Europe, Middle East, Africa and Russia), North America, East Asia, and Australia & New Zealand.

A qualified engineer, Mr Maynard has been with Terex Corporation since 2001 as a result of the acquisition of German crane and excavator manufacturer Atlas, and since then he has been in a number of positions of increasing responsibility. Initially, after switching from engineering, he was a regional sales manager for Terex Construction, and in 2010 became the UK&I general manager for mobile cranes.

In 2012, Mr Maynard assumed responsibility for the European sales and service organisations for mobile cranes as part of the management team. Most recently, he was responsible for all sales activities in Europe, Russia and in CIS member states. ■

# LiuGong to acquire CPMS, establishes first int'l retail operation

Guangxi LiuGong Machinery has signed a share purchase agreement to acquire the business operations of Construction Plant & Machinery Sales (southeast) Limited (CPMS), which serves as LiuGong's exclusive dealership for England, Wales and Scotland. With this move, LiuGong expects to establish its first international retail operation.

LiuGong's European headquarters in Warsaw, Poland, will assume responsibility for the UK-based direct sales operation. The former shareholders of CPMS will remain as directors of the business, ensuring customers a seamless business transition.

LiuGong plans to continue its investment to not only broaden the national coverage, but also to invest in people and processes to support the growth objectives in Europe's largest construction equipment market.

"The UK is an important market for us. CPMS has laid a strong foundation for LiuGong to make an impact not only in the traditional earthmoving market but also in demolition, recycling and plant rental sectors. We have an outstanding management team in place at CPMS who are true retail professionals and highly experienced in the UK construction equipment market," said Howard Dale, chairman of LiuGong Dressta.

Brain Prescott, CPMS managing director commented, "We are really pleased to have LiuGong onboard. The new entity will be part of a much larger group and for our customers, this means greater financial stability, direct support from the manufacturer, a larger range of machines to fulfill our customers' needs, as well as greater national coverage and support resources. In addition, this move will enhance resale values as the population of LiuGong machines grow." ■



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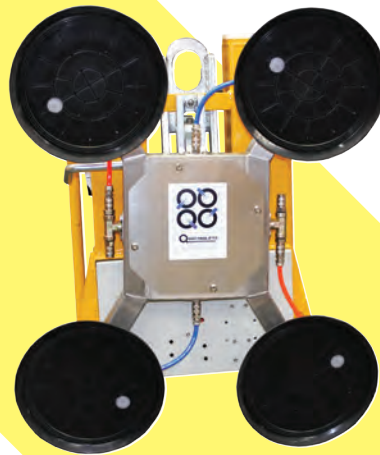


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17 to 18 Jul 2019	Trenchless Asia 2019 Jakarta International Expo Jakarta Indonesia	Westrade Group Ltd Tel: +44 1923 723990 Email: pharwood@westrade.co.uk Website: www.trenchlessasia.com
1 to 3 Aug 2019	Conmart Expo 2019 China Import & Export Fair Pazhou Complex Guangzhou China	Overseas Promotion Tel: +86 156 2652 1558 Email: service@conmart.com.cn Website: conmart.com.cn
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@wocasia.com Website: www.wocasia.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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# IAPAs 2019 winners celebrated in Dubai

Almost 350 industry professionals gathered on 6 March 2019 in Dubai, UAE, to honour the winners of the International Awards for Powered Access (IAPAs). Jointly organised by Access International and IPAF, the IAPAs celebrate best practice and excellence in the powered access industry, and this was the first time the event was held in the Middle East. The next edition of IAPAs will be returning to the UK, to be held in London on 23 April 2020.

**The full list of 2019 IAPAs winners include:**

- IPAF Training Instructor of the Year: Charlie Ellis, Nationwide Platforms, UK
- IPAF Training Centre of the Year: ALS Safety (Riwal), UK
- Access Photograph of the Year (sponsored by Facelift): Santeri Keränen, Finland
- Product of the Year – Mast Climbing Work Platforms/Hoists: Alimak, Sweden, for its Mammoth TM
- Product of the Year – Vehicle/Trailer-Mounted: Bronto Skylift, Finland, for its S35EM truck
- Product of the Year – Scissor Lifts and Vertical Masts: Hybeko, Norway, for its Tunnel 3390 RT scissor lift
- Product of the Year – Self-Propelled Booms & Atrium Lifts: Almac, Italy, for its Jibbi 1250 Evo tracked boom



- Contribution to Safe Working at Height: Proud2BSafe, UK
- Powered Access Pioneer: Dingli, China
- Digital Development: JLG Industries, US, for its BIM library
- Access Rental Company of the Year: A-Plant, UK
- Innovative Technology: Skyjack, Canada, for its Elevate On App
- IPAF/Access International Lifetime Achievement Award: John L Grove, US, cranes and access pioneer. ■

## Dingli bags Powered Access Pioneer Award

This year, China-based global manufacturer Zhejiang Dingli has won the Powered Access Pioneer Award of IAPAs. “Since 2005 Dingli’s influence has grown worldwide. Its growth in its home market of China has placed it at the centre of efforts to introduce modern access equipment, improving safety for countless workers on site,” commented the IAPAs judges.

Dingli said that in recent years, the company’s achievement has progressed steadily due to its first-class product quality. “While improving our products, we have also been actively practising our corporate social responsibility,” added the company.



Dingli further explained that it has not only been promoting the use of aerial work platforms (AWPs) in China, but has also been educating the operators of AWPs. “Over the past 10 years, we have been trying our best to deliver the standardised AWP operation and the concept of safe AWP operation to every operator engaged in AWP operation, and also actively promote the healthy and steady development of the industry.” ■

ABOVE LEFT: Dingli’s products are being sold in more than 80 countries and regions.

LEFT: Huang yan of Dingli (on the right) receives the award on behalf of the company.

## Brad Bohler named IPAF president

Brad Bohler of Skyjack has been appointed as IPAF president, leading the organisation for the next two years. Norty Turner of United Rentals has also been elected as IPAF deputy president and Karin Nars of Dinolift confirmed as vice president.

Mr Bohler replaces Nick Selley of AFI-Uplift, who has completed his full two-year term as president and will now assume the ex officiorole of immediate past president. Meanwhile, Andy Studdert of Cramo, the 2015-2017 IPAF president, maintains his seat on the IPAF board as a director. Tim Whiteman continues in his role as CEO and managing director of IPAF. ■



Brad Bohler of Skyjack (in the centre) has been appointed as IPAF president.

# IPAF launches updated MEWPs for Managers course

IPAF is launching an evolved version of its globally recognised MEWPs for Managers training. The course is aimed at those who plan, supervise or manage temporary work at height using powered access and for the first time, it will be available as a standalone eLearning version. “This will make it very convenient for project planners, site managers and supervisors to fit this essential training into their busy schedules,” said Paul Roddis, training manager at IPAF.

“The updated course has been completely overhauled to make it easier to directly apply the learning in the real world. The redesigned course considers the whole process of MEWP management, from selecting the right machine, properly training the appropriate operators and providing the right protections, through securing the MEWPs to organising safe delivery and collection of the plant to and from work sites,” explained Mr Roddis.

“It now utilises interactive 360-degree graphics and virtual scenarios that contextualise specific hazards and requires candidates to put various pieces of risk assessment and technical and safety guidance together to identify and control identified risks.”

IPAF said the course is currently being rolled out in English-speaking IPAF territories including the UK & Ireland, North America and the Middle East, while work continues apace to complete translations into all official IPAF training languages. The course will also be released in German, and other languages, during 2019.



IPAF’s MEWPs for Managers course is essential for managers, supervisors and those planning MEWP operations around the world. It can aid compliance with the requirement for manager and supervisor training in the recently published updated ANSI A92 suite of standards in the US, in Singapore the Approved Code of Practice SS616 also states that any person who is supervising or managing the use of MEWP should be competent, and has been recognised as an important qualification for managers at all levels by the UK HSE. ■

Website: [www.ipaf.org/training](http://www.ipaf.org/training)

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## Conexpo-Con/Agg gears up for next edition

Conexpo-Con/Agg is getting ready for its next edition, which will take place from 10 to 14 March 2020 in Las Vegas, USA. It will co-locate with IFPE, the International Fluid Power Exhibition for the fluid power, power transmission and motion control industries. Association of Equipment Manufacturers (AEM) is a show owner and producer.

Conexpo-Con/Agg & IFPE 2020 will be held at the Las Vegas Convention Centre and nearby Festival Grounds. According to AEM, the show connected campus will feature multiple registration areas and hotel and intra-show shuttles

“The show is shaping up to be one of the best ever; attendees and exhibitors will not be disappointed!” said Mary Erholtz, Conexpo-Con/Agg chair and vice president marketing for Superior Industries. “AEM and our show committees of industry leaders are working to deliver an outstanding event focused on the latest innovations, technologies and best practices to succeed in our changing world.”

In September last year, AEM announced that Conexpo-Con/Agg is expanding the 2020 show footprint to include the Las Vegas Festival Grounds, located on the Las Vegas Strip adjacent to the Circus Circus Hotel.

“The Festival Grounds provides exhibit space and show services that our exhibitors and attendees will be very pleased with,” affirmed Dana Wuesthoff, AEM vice president of exhibitions and event services and also show director for Conexpo-Con/Agg.

Conexpo-Con/Agg is North America’s largest construction trade show representing asphalt, aggregates, concrete, earthmoving, lifting, mining, utilities and more. It is also considered one of the largest global construction machinery trade shows, attended by visitors from all over the world. The last edition in 2017 attracted nearly 128,000 visitors, with close to 26,000 international visitors coming from 150 countries. The show drew 2,800-plus exhibitors on an exhibition space of 2.8 mil-plus net sq ft (about 260,128.512-plus sq m).



ABOVE AND LEFT: Conexpo-Con/Agg & IFPE 2020 will return from 10 to 14 March 2020 at the Las Vegas Convention Centre - the show will be expanded to include the nearby Festival Grounds.

“Our company has been attending Conexpo-Con/Agg for three decades now and plans to continue due to the amount of knowledge we gain. Conexpo-Con/Agg has provided us the resources needed to create greater efficiencies and synergies within our own company,” said Chris Lane of Ronald Lane Inc. ■

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

## Hillhead 2020 expected to be bigger

The next edition of Hillhead will return from 23 to 25 June 2020 at Tarmac’s Hillhead Quarry, near Buxton, the UK. It follows a record-breaking edition in 2018, which featured 546 exhibitors and 19,753 visitors.

Hillhead showcases the latest products, services and equipment for the quarrying, construction and recycling industries. It also provides an opportunity to see the equipment in action across four live demonstration areas.

The show is organised by Nottingham-based The QMJ Group, specialist magazine publishers and exhibition organisers for the quarrying, natural stone and associated industries.

The organiser said that demand for stand space in 2020 is expected to be very high, and a number of areas have been identified to improve the visitor experience. As a result, further investment is planned for additional shuttle buses serving the free car parking, more directional signage on the showground, additional public seating areas for visitors and the ability to accept card payments in the catering outlets. ■

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



The next edition of Hillhead will be held from 23 to 25 June 2020. The show features the latest products, services and equipment for the quarrying, construction and recycling industries.

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# Skyjack's new range of full-size rough terrain scissors

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

The decision to move forward with a new larger rough terrain range is twofold, said Skyjack. It is to improve the specifications and performance of the existing models, while also mitigating the cost impact of the new ANSI/CSA standards.

Skyjack also has plans for an even 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 models boast increased working heights, increased capacities, faster function speeds, all along with market's largest work platform across the range. The machines 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 this range is Skyjack's Smartorque technology, which provides the machines with excellent torque and hydraulic performance, but with less engine horsepower. This system has been used on the company's TH series since 2015 and because it does not require diesel particulate filter (DEF), diesel exhaust (DEF) and no other active exhaust after treatment, it is extremely beneficial to rental companies, said Skyjack. ■

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



The SJ9253 RT is currently Skyjack's largest scissor lift, offering a working height of 17.98 m. It is the first model in the company's new full-size rough terrain range.

## Meeting the new ANSI standards

Skyjack has also released a white paper highlighting the core changes to its DC scissor lifts in conjunction with the new ANSI standards. It outlines what Skyjack did to go beyond compliance and treat these new designs as an opportunity.

"Skyjack's primary objectives are to continue supplying our customers with simple reliable products that give them a great ROI," explained Brad Boehler, president of Skyjack. "Many of the new standards now align North American machines with what's been in use in the rest of the world for decades. Some of these changes may be perceived as negative at first, but our team has done our best to make other improvements to mitigate that initial hesitation."

Skyjack initially launched a white paper when the standards were impending early 2017; however, the standards that officially passed in December 2018 had slightly changed. With standards officially published, the company is communicating the solidified changes for its A92.20 compliant DC scissor lifts. While the white paper itself primarily focuses on DC scissor lifts, it does mention that Skyjack booms will see an increase in capacity ratings.

"SkyCoded has been at the heart of every Skyjack machine for decades and our colour coded and numbered wiring system will still be there, but we'll now have a display that explains errors in plain language," said Kristopher Schmidt, product



manager at Skyjack. "It ties perfectly into Elevate telematics and gives us more insight into the machine's usage."

In addition to outlining the changes to its new ANSI-compliant machines, the white paper also outlines how Elevate works with this new system. Products within Elevate's digital suite such as Elevate On are able to track machine pre-checks and make familiarisation material more easily accessible on-site.

"New standards affect everyone within the rental ecosystem and our team is working hand in hand with our customers, by providing material for them and end users with material such as this white paper, to help contribute to a seamless integration," concluded Mr Boehler. ■

# Aquilla system expedites underground waterproofing

GCP Applied Technologies has introduced the Aquella waterproofing system, which is designed to deliver high performance, durable waterproofing for heavily reinforced soil-retaining walls such as diaphragm walls or contiguous bored pile walls.

The company highlighted that in Southeast Asia, contractors often encounter underground conditions that are damp and wet. With limited waterproofing options, they typically use waterproofed concrete but often find the results unsatisfactory for this application. In response to this, GCP developed the Aquella waterproofing system to provide a reliable and easy-to-apply solution for contractors and engineers in the region.

The Aquella system is a tri-component, spray-applied, high performance membrane especially developed for waterproofing earth-retaining structures. This polymer-modified liquid waterproofing system enables direct application onto damp substrate surfaces, such as contiguous bored pile walls, secant pile walls and diaphragm walls. It enables excellent bond and seal around rebar and tie rod penetration to reduce long-term repair costs, and offer excellent weather and exposure resistance for schedule flexibility.

The system allows a dual adhesion bond to both the substrate and the subsequent poured concrete. This helps to prevent lateral water migration of up to 10 bar of hydrostatic pressure, said GCP, and results in a durable and effective barrier against water ingress.

Aquilla waterproofing is easy to use, because it is spray applied - this expedites the construction process while providing a tight waterproof seal. It is also solvent free and can be cold applied so it does not require hot works, making it safer for workers and more environment-friendly.

In addition to Aquella waterproofing, GCP offers a complete waterproofing system, which includes the Preprufe pre-applied waterproofing system, Bituthene self-adhesive waterproofing system, Silcor liquid-applied waterproofing system, Hydroduct drainage composites, Adcor waterstops and joint protection systems, as well as De Neef resin injection systems. GCP also offers an extensive range of fully compatible waterproofing products and accessories for effective protection of foundations. ■

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



ALL IMAGES: The Aquella waterproofing system from GCP Applied Technologies is a tri-component, spray-applied, high performance membrane especially developed for waterproofing earth retaining structures. The system offers many features that make it ideal for the Southeast Asian market.

## Link-Belt unveils 120|RT rough terrain crane

Link-Belt has 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 makes running diagnostics quicker and easier. 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. According to Link-Belt, the V-CALC has proven itself in general construction and infrastructure applications on the 75|RT. 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, Link-Belt 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 and contractor needs. 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.

Introduced on the 75|RT in 2017, Link-Belt's new cab design for its rough terrain cranes has reportedly been well received in the field, both in terms of visibility, operator comfort and intuitive design. All electrical components coming into the cab are bulk headed for 'plug and play' assembly.

Specific cab specifications include 20 degree tilt, ergonomic seat with electronic joystick/single axis controllers; automotive-type, high capacity HVAC system; increased storage and interior lighting; time delayed wipers; USB and 12-V power supply connections; and van-style pop out door.

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.

Link-Belt carefully considers the location of swing out engine access doors and centralised electrical locations – keeping them



ALL IMAGES: Link-Belt's 110-t 120|RT rough terrain crane has a six-section 11.6 – 50 m pin and latch formed boom. The crane is equipped with V-CALC system, which features 81 different outrigger configurations with real time 360-degree charts.

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 can be driven right off a conventional lowboy trailer, assemble counterweight and be ready to go to work. ■

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

## Brokk 70: Small and powerful

Brokk has 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), comes 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 is equipped with several new attachments. The new Brokk BHB105 breaker weighs in at over 100 kg and comes with 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 keeps the same compact dimensions 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 only 16 Amp fuse. ■

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

The new Brokk 70 delivers much more demolition power compared to its predecessor, and comes with the Brokk SmartPower technology.

# FIT TO BE compact

Introducing an all-new Snorkel scissor lift with a revolutionary design. The **Snorkel S3019E** self-propelled electric scissor lift features a sunken scissor stack that stows entirely inside the chassis for a low step-in height. A low stowed height can pass through doorways without the need for folding guardrails. This zero-emission lift stacks the deck with all-electric two-wheel drive and electric steering that eliminate hydraulic hoses.

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## 'Intelligent' RTX1250i2 ride-on tractor from Vermeer

Vermeer's new RTX1250i2 ride-on tractor boasts intelligent controls and interchangeable attachments to help maximise productivity for utility installation work.

Based on the prior RTX1250 ride-on tractor design, the new RTX1250i2 features the latest in technology to make it more convenient to operate, more efficient on the jobsite and reduce the amount of time it takes to swap out i2 attachments.

The controls on the RTX1250i2 deliver several productivity advantages, including Productivity Zone, Auto Plunge, TrenchSense electronic control system and Ecolde engine control system.

Productivity Zone intelligent feature identifies the ideal operating range and ground speed for the rear attachment being used to optimise machine production. With a flip of a switch, the Auto Plunge technology monitors engine rpm and reduces the rate of plunge automatically for a trencher or rockwheel attachment, so that the rpm does not drop too far.

The onboard TrenchSense electronic control system helps prevent engine stall when working in challenging ground conditions. It actively monitors engine rpm while trenching, and it will automatically pause the tractor's forward creep if engine rpm drops or the trencher chain stops.

The Ecolde engine control system can help reduce fuel consumption by automatically lowering the engine's speed to an idle, if the tractor has not been active for 30 seconds.

Vermeer has made it more convenient to customise and reconfigure the RTX1250i2 with intelligent i2 attachments, which can be switched out in as little as 60 minutes. The self-identifying i2 attachments communicate with the tractor and the machine's controls are then adjusted according to the operational needs of the attachment.

Furthermore, the RTX1250i2 comes with an optional remote control for convenient maintenance and trailer loading/unloading. Powered by a 95 kW Deutz diesel engine, the machine offers efficient power for high load installs in difficult ground conditions and provides a quieter ride than similar-sized tractors, said Vermeer. ■

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



ALL IMAGES: Vermeer's new RTX1250i2 ride-on tractor features the latest in technology to make it more convenient to operate, more efficient on the jobsite and reduce the amount of time it takes to swap out i2 attachments.

# Ammann offers new articulated light tandem rollers

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 utilise 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 make. 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 rollers are compatible with Ammann ServiceLink, a fleet management system that enables close monitoring to keep owners informed of machine service needs. Other key features include an electronic drive lever for smooth starts and stops, especially important on asphalt jobs; an optional Intelligent Compaction tool for optimal efficiency; excellent all-around machine visibility for safety on the jobsite; accessible service and maintenance points; and maintenance-free parts. ■

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



ABOVE AND RIGHT: Some design enhancements on the new rollers include an intuitive dashboard layout, a redesign of the front and rear of the machine, and a new LED light system.



Ammann's new light tandem rollers have working widths ranging from 1,000 mm on the ARX 23-2 up to 1,380 mm on the ARX 45-2.



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# Biggest Potain topless crane and new Grove models

Manitowoc has unveiled the largest Potain topless crane, the MDT 809, which provides up to 40 t of lift capacity and can accommodate up to 80 m of jib.

For transport, the crane is especially compact, with everything but the slewing mechanism capable of travelling in a standard container. According to Manitowoc, the whole crane transports in either 10 or 11 containers, depending on the winch option selected, which is four to five fewer containers than is typically required for a crane of this size. The MDT 809 also has a new 8 m cross base that delivers the performance characteristics of a 10 m chassis, but which requires only one container for transport.

The MDT 809 is fast to assemble once on site: typically, around twice as fast as other 40 t cranes and also requiring less space, said Manitowoc. With its full complement of jib, the crane can be assembled at a 50 m working height in less than three days. The 8 m cross base is also faster to set up than the 10 m alternative, added the company.

From the range of regular frequency-controlled hoists, options for the MDT 809 span from the 100 LVF to the 270 LVF. An optional 150 HPL is also offered, from the High Performance Lifting range, for the ultimate in speed and strength. These winch options give the crane a maximum available capacity of 25 t, 32 t or 40 t. Tip loads of up to 9 t are available at the 80 m maximum. With the new reinforced K-mast system, freestanding heights of up to 80 m are possible.

Users of the MDT 809 can choose from a two-fall configuration on the trolley for faster duty-cycle lifting, or four-falls for heavy lifting. Inside the cab a simple push-button solution enables the operator to activate the cable-tensioning system automatically. This is particularly useful for long-running jobsites, where tensioning is required more frequently. The Crane Control System (CCS) is available as well.

## New Grove all-terrain cranes

The new Grove GMK5250XL-1 is believed to have the longest main boom (78.5 m) of any five-axle all-terrain crane. This new model features Megatrak suspension and the Twin-Lock boom pinning system, just like all Grove all-terrain cranes. It is also available with the MAXbase variable outrigger function for added versatility on the jobsite.

Options for the GMK5250XL-1 include the VIAB turbo retarder clutch, which first featured on the original GMK5250L. The VIAB unit enables wear-free starting and braking, enhancing manoeuvrability and operator comfort. The crane also offers a compact footprint, making it ideal for use in crowded or urban areas.

In the three-axle category, the GMK3060L sets new standards of excellence and includes a seven-section Megaform boom with 48 m of main boom and a maximum tip height of 65 m when working with its full jib. For consistency and control, the 60 t crane features Manitowoc's CCS with boom configurator for fast and efficient set-up. With its compact carrier, the GMK3060L can also squeeze into tight locations.



ABOVE: Potain MDT 809, the largest topless crane ever built by Manitowoc.

RIGHT: The GMK3050-2, with a 40 m main boom, is an update of Grove's long-running three-axle offering, the GMK3050-1.

BELOW: The GMK5250XL-1 has a 78.5 m main boom, which is said to be the longest main boom of any five-axle all-terrain crane.



Meanwhile, the new GMK3050-2 is an update of Grove's long-running three-axle offering, the GMK3050-1. It has a 40 m main boom, fast operating speeds and a single counterweight configuration for ease of use. Its engine and design have also been updated to meet the latest requirements of Euromot 5 (which also covers both Tier 4 Final and Tier 3 regulations in the US and the rest of the world).

Manitowoc highlighted that both the GMK5250XL-1 and GMK3060L offer the most compact footprint in their class, and have excellent load charts when configured in taxi-mode, at 12-t per axle. ■

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

## BASF Master X-Seed STE expands concrete performance

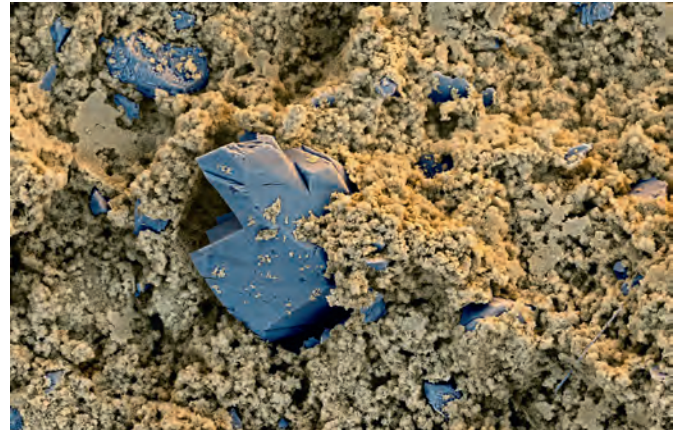
BASF has launched a strength-enhancing admixture solution for the construction industry, Master X-Seed STE, which is designed to significantly improve both early and late-age strength development in concrete. It helps make production of concrete more efficient.

The concept originated from BASF's X-Seed, a seeding technology used to promote cement hydration and speed up concrete hardening. Master X-Seed STE further enhances concrete's strength development and performance characteristics.

According to BASF, Master X-Seed STE admixture utilises calcium silicate hydrate (CSH) nanoparticles, along with other technologies (admixture solutions), to facilitate and improve strength development at all ages of the concrete. The product is specially formulated for the Asia Pacific market.

Master X-Seed STE enables the increased use of supplementary cementitious materials, thus helping to reduce carbon footprint associated with concrete production, said BASF.

The company highlighted that Master X-Seed STE admixture allows concrete producers to expand the performance space of a given concrete mixture and optimise the cementitious content, by permitting a strength safety factor up to 15%. This allows earlier stripping of forms to improve production efficiency. It is



Master X-Seed STE is a newly launched strength-enhancing admixture solution from BASF, which expands concrete performance while reducing environmental impact.

recommended for use in ready-mixed and precast concrete and self-consolidating concrete (SCC). ■

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

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# Liebherr's new drilling rigs make world debut

The new Liebherr LB 16 unplugged is believed to be the first drilling rig on the market with local zero emission. The company said the machine offers an alternative drive concept (electro-hydraulic version), and it can also be operated by battery without a cable, hence unplugged.

According to Liebherr, there are no restrictions in performance and application of the LB 16 unplugged when compared with the conventional versions that have diesel engines. This new model can also achieve a maximum drilling diameter of 1,500 mm and drilling depth of 34.5 m. The operating weight is 55 t.

The LB 16 unplugged has an electric engine delivering 265 kW of power. The battery is designed to last for a 10-hour working day and can be simply recharged using a conventional jobsite electric supply (32 A, 63 A), said Liebherr. Using a 125 A supply, the battery can be fast-charged in barely seven hours. The alternative drive of the LB 16 unplugged is also reflected in the integrated battery blocks mounted on the uppercarriage.

The absence of a combustion engine delivers two advantages, explained Liebherr. The LB 16 unplugged results in no local emissions and significantly less noise. Thus, the drilling rig is suitable for operation in noise-sensitive areas, such as city centres. For building projects, which have requirements deriving from emission regulations, the electrically driven LB 16 unplugged can be ideal.

The LB 16 unplugged provides higher safety and simpler application, thanks to the Ground Pressure Visualisation system. This system calculates the current ground pressure of the machine in real time and compares it with the specified safety limits of the relevant position. The ground pressure is displayed in the operator's cab and the operator is always aware of whether the machine is situated in, or is approaching, a critical area.

The LB 16 unplugged is also equipped with a new cabin concept, which features a modern air-conditioning system with improved airflow, an optimised field of vision and reduced noise protection, as well as an orthopaedic operator's seat with integrated heating and cooling. Liebherr said the machine will be available in Europe starting from mid-2019.

## LB 45 drill rig - the successor to the LB 36

The new LB 45 delivers a torque of 450 kNm, an increase of approximately 10% in comparison to the LB 36. Both the counterweight and the leader of the LB 45 are modularly



ABOVE AND LEFT: Liebherr LB 16 unplugged is believed to be the first drilling rig on the market with local zero emission.

RIGHT AND BELOW: The new LB 45, the successor to the LB 36, features a torque of 450 kNm, an increase of about 10%.



constructed, thus allowing for quick and easy assembly and flexible application. The LB 45 is scheduled to be available globally starting from autumn 2019 (around September onwards).

The LB 45's leader top is designed for different drilling axes, making it suitable for a wide range of applications. Through the enhancement of the drilling axes by 500 mm, the new rig can be applied for drilling diameters up to a maximum of 3.3 m. At the same time, the maximum drilling depth for Kelly drilling with five-fold Kelly bar has been increased to 100 m. The strong winches with a maximum pull force of 42 t enable excellent performance under difficult conditions. The noise emission is also considerably reduced, thanks to their elastic mounting.

Like the LB 16 unplugged, the LB 45 is equipped with the Ground Pressure Visualisation system, which calculates the current ground pressure of the machine in real time and compares it with the specified safety limits of the relevant jobsite. The LB 45 drill rig is also fitted with a new cabin concept – same as LB 16 unplugged – for greater operator comfort.

Locking of the Kelly bar's telescopic sections becomes significantly easier due to the Kelly Visualisation system. With the real-time display of the Kelly locking recesses of the Kelly bar on the cabin monitor, the operator is always informed of the actual distance to the next locking recess.

During continuous flight auger drilling the concreting process is automated, thanks to the Drilling Assistant system. The remote control simplifies the loading process for transportation as well as the assembly of the machine. ■

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

# Vögele develops new 'Super' compact pavers

Joseph Vögele AG is extending its product portfolio with the addition of two new compact pavers, the Super 1000(i) tracked and Super 1003(i) wheeled pavers. Part of the Classic Line, both models are designed for small and medium-sized construction projects. Suitable applications include municipal jobsites, landscaping projects and construction of small areas, as well as laying down pavements cost-efficiently and to a high quality.

The machines are both equipped with the ErgoBasic operating concept – it was developed on the basis of the ErgoPlus operating system, which is installed in Vögele's large pavers, but it has been tailored specifically to the needs and requirements of Classic Line users.

With ErgoBasic, the machines in the Classic Line are just as fast, precise and intuitive to operate as the Premium Line machines - but the system is confined to the essential and necessary basic functions. For example, clearly structured function and status indicators ensure that the operators always have complete control of the machine, even without a display; they can read off the filling level of the fuel tank directly and detect any error messages.

ErgoBasic also offers glare-free backlighting for night-time jobs and simple steering by rotary controller or, in the case of wheeled models, by steering wheel. However, the additional features of the Premium Line such as the automated programmes of AutoSet Plus or the PavDock Assistant communication system are not available on these machines.

Powered by diesel engines, the new compact pavers can achieve a rated output of 55.4 kW. The engines of the i-machines, the Super 1000i and Super 1003i, feature efficient gas after-treatment. They fulfil the strict European and US exhaust emissions standards. The engines of the Super 1000 and 1003 meet the requirements of the European Stage 3A and the US EPA Tier 3 without gas after-treatment.

A 6x2 wheel drive is available for the wheeled version, and the machine can also be configured as a 6x4 version on request. The maximum travel speed of the wheeled version is 20 km/hr. The pavers can be combined with the AB 340 extending screed with vibrators (V version) and with tamper and vibrators (TV version). As a result, pave widths of up to 3.9 m can be achieved with ease.



ABOVE AND LEFT: Vögele has developed two new compact pavers, as part of its Classic Line. These include the Super 1000(i) tracked (above) and Super 1003(i) wheeled (left) pavers.

BELOW: The Niveltronic Basic system for automated grade and slope control has been integrated into the machine control system.

Vögele is also offering the Niveltronic Basic system for automated grade and slope control on the Classic Line pavers. It has been integrated into the machine control system and therefore precisely tailored to the paver model concerned. A highlight of Niveltronic Basic is its simple and intuitive handling. This means that even relatively inexperienced operators can quickly learn the correct way to operate the system.

Each side of the screed is operated by a separate Niveltronic Basic remote control unit. This unit can be easily removed from its magnetic brackets, giving operators a large range of action so that they can take up the optimum position for every paving job. A variety of Vögele sensors are available for Niveltronic Basic, in keeping with the machines' large and varied range of uses. It extends from a variable mechanical grade sensor to non-contacting sonic sensors and a laser receiver for surfacing areas. ■

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



The new compact pavers are equipped with the ErgoBasic operating concept.

## The new 'Star' of Haulotte

Haulotte is expanding its popular vertical mast range with the launch of Star 8S (Star 20 in the US) to work efficiently up to 8 m. This multipurpose machine is ideal for indoor use such as finishing works, maintenance and restoration, logistics and distribution, and more.

The Star 8S has a load capacity of 200 kg and travel speed of 4.5 km/hr. Fitted with deep-cycle batteries, the machine allows operators to perform their daily tasks all day long.

With a narrow turning radius, the Star 8S can manoeuvre in highly restricted spaces. Combining high torque with precise and smooth control, the AC motors deliver excellent precision and comfort for the machine to go to hard-to-reach areas.

For increased flexibility, the Star 8S can be lifted lengthwise or widthwise during transport phases. Thanks to its automatic protection system against potholes, the machine can get over numerous obstacles, and cross slopes of 25%.

Equipped with smooth proportional movements, control and manoeuvring aloft are intuitive, secure and precise. The Star 8S offers higher stability, and a non-skid step has been integrated into the machine's design to allow a safe entry in the platform.

The basket extension provides additional space and a further reach of 40 cm.

To ensure less maintenance, the Star 8S is designed with the Haulotte Activ'Screen on-board diagnostic tool. Simple to use, it provides operators with key information. All pins, nuts and metal parts have been specially treated to guarantee optimum resistance to corrosion, said Haulotte. The two batteries swing-out trays can open easily, and a quick-open inspection hatch enables easy access to the hydraulic block to optimise downtime costs. Asynchronous motors also require no regular maintenance. ■

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



ABOVE AND RIGHT: Haulotte's new Star 8S vertical mast is designed for indoor use, offering a load capacity of 200 kg and travel speed of 4.5 km/hr.



## Haulotte upgrades RTJ articulating and telescopic boom lifts

With the latest updates on the HA16 RTJ, HA20 RTJ and HT23 RTJ models, Haulotte's innovations are now available on all of the company's articulating and telescopic boom lifts (RTJ series) from 16 to 28 m.

Haulotte Activ'Shield Bar ensures the highest level of safety for operators. In a crushing situation, when the operator is propelled against the bar, the machine stops automatically. Protected by the safety gap, the operator can have easy access to controls with unobstructed visibility.

Haulotte Stop Emission System improves comfort for operators, by limiting polluting and noise emissions. The engine automatically stops after 90 seconds of inactivity, while the operator can remain focused on the job. The engine instantly restarts when the operator performs an action.

Haulotte Activ'Lighting System is essential for the safety of the operator during loading and unloading. A minimum of 10 LED spotlights allows the operator to precisely control and clearly discern obstacles and edges in the working area.

Haulotte Activ'Screen is an intuitive interface with embedded diagnostics. It enables operators and technician to have real-time access to key information of the machine. This interface, which integrates a step-by-step diagnostic and



LEFT AND BELOW: Haulotte HA16 RTJ Pro articulating boom is fitted with Haulotte's Activ'Screen, Activ'Lighting System, Stop Emission System and Activ'Shield Bar.



resolution tool, is now available on mobile app: Haulotte Diag. Technicians can enjoy wireless mobility for conducting more effective configuration and diagnostics. ■

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# Powerful 65,000MAX earth drill from Auger Torque

The new 65,000MAX from Auger Torque can produce more than 66,000 Nm of torque to tackle major earth drilling tasks. The unit is ideal for use with excavators between 21 t and 45 t. It is fitted with Auger Torque planetary gearbox to offer durability and efficiency, while being safe and reliable with NDS (Non-Dislodgement Shaft) as standard.

The 65,000MAX is compatible with Auger Torque's range of alignment and torque monitoring products for accurate earth drilling applications. The high-quality hydraulic motors, output shaft bearings that

are 50% larger than any other comparable drive, and the use of only high-grade materials mean that the earth drill will have a long, reliable service life.

The NDS is a single-piece drive shaft assembled top down and locked into the earth drill housing. This is believed to be unique to Auger Torque and comes standard across the whole range of auger drives, ensuring that the shaft will never fall out. Such a feature also provides a safer work environment, not only for the operator but also any surrounding workers.

The 65,000MAX's torque is amplified by using the Auger Torque planetary gearbox. This system allows the motor's output torque to be multiplied with extreme efficiency as well as delivering the durability and reliability needed. The fitment of a case drain, which is also standard for the 65,000MAX largely eliminates the need for expensive pressure relief valves and Auger Torque recommends direct plumbing this unit for optimal performance. ■

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



ALL IMAGES: The new 65,000MAX earth drill from Auger Torque is ideal for use with excavators between 21 t and 45 t. The unit can produce more than 66,000 Nm of torque to carry out major earth drilling tasks.



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# New Demag CC 2800-2 lattice boom crawler crane

Succeeding the CC 2800-1 model, the new Demag CC 2800-2 lattice boom crawler crane is just as versatile. It is suitable for infrastructure projects, including road and bridge construction, as well as 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 also be used with the CC 2800-1. This enables customers 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 offers 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 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. The weight of the tracks was likewise optimised compared to the CC 2800-1. Featuring 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 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 provides 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 give the operator 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 include 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



TOP AND ABOVE: The new Demag CC 2800-2 lattice boom crawler crane, the successor to the CC 2800-1 model, offers a maximum lifting capacity of 600 t and maximum load moment of 7,712 tm.

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](http://www.terex.com/cranes)



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## Cat 336 and 336 GC increase jobsite productivity

The Next Generation 36-t size class excavators from Caterpillar - the 336 and 336 GC - increase operating efficiency, lower fuel and maintenance costs, and improve operator comfort in comparison to previous models.

Delivering high-production performance, the Cat 336 features standard integrated Cat Connect Technology and the most power and lift capacity of the two models. The result is maximum productivity at the lowest cost.

The Cat 336 GC combines the right balance of productivity features with reduced fuel consumption and maintenance costs. The result is high reliability and low-cost-per-hour performance.

With a 6.5 m boom and 3.2 m stick, both the 336 and 336 GC have a maximum digging depth of 7,520 mm, maximum loading height of 7,080 mm and maximum reach at ground level of 11,050 mm.

The Cat 336's integrated Cat Connect Technology increases operating efficiency by up to 45% over traditional grading operations. The standard Cat Grade with 2D system provides guidance for depth, slope and horizontal distance to grade through the standard touchscreen monitor, making operators more accurate. The system is readily upgradable to Cat Grade with Advanced 2D or Cat Grade with 3D.

Standard Grade Assist automates boom, stick and bucket movements so that operators can stay on grade with single-lever digging. Cat Payload delivers precise load targets and increased loading efficiency with on-the-go weighing and real-time payload estimates without swinging to prevent truck over/underloading.

The E-fence function prevents the excavator from moving outside operator-defined set points. This is particularly useful when working beneath structures or near traffic. Cat Link hardware and software connect jobsites to the office and provide customers with machine-critical operating information.

By design, Cat Next Generation excavators can produce more work per unit of fuel than the models they are replacing - up to 15% more fuel efficiency for the 336, said Caterpillar.

The Smart mode operation automatically matches engine and hydraulic power to digging conditions, optimising both fuel consumption and performance. Engine speed is automatically lowered



ABOVE AND LEFT: The 336 GC is one of Caterpillar's Next Generation 36-t size class excavators. The machine combines the right balance of productivity features with reduced fuel consumption and maintenance costs.

when there is no hydraulic demand to further reduce fuel usage. The cooling system features a new fan that runs on demand to keep the excavator working at the correct operating temperature for maximum efficiency.

With a new electrohydraulic system built for responsiveness and efficiency, the Cat 336 and 336 GC feature a new main control valve that eliminates the need for pilot lines, reduces pressure losses, and lowers fuel consumption. Fewer hydraulic lines on the machines result in less oil required, lowering long-term operating costs.

Offering extended and more synchronised maintenance intervals, the new Cat excavators can carry out more work at a lower cost and reduce maintenance costs by up to 15% over the previous series.

The new Cat air filter with integrated pre-cleaner and primary and secondary filters has double the dust holding capacity of the previous design. The new Cat hydraulic return filter has a 3,000-hour

service life - a 50% increase over the previous filter. The fuel system filters are synchronised for service at 1,000 hours - a 100% increase over the previous filters.

With a choice of Comfort or Deluxe cab packages, all Next Generation Cat excavator cabs come equipped with standard features like keyless push-button start, large 203-mm touchscreen monitor with jog dial keys for control, and sound-suppressed rollover protective structures (ROPS) to offer greater comfort and safety.

The advanced viscous mounts reduce cab vibration by up to 50% over previous models. Automatic climate control maintains internal cab temperature settings, regardless of external ambient temperatures. Programmable joystick buttons for response and pattern allow the operator to 'dial in' productivity settings. Large front, rear, and side windows enhance visibility; and optional 360-degree visibility (336 only) combines images from multiple machine-mounted cameras to enhance the operator's sight lines in all directions. ■

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

# PowerCarbide: Sandvik's most powerful carbide grades

Sandvik was reportedly the first company in history to manufacture rock tools with cemented carbide, which is considered one of the most successful composite engineering materials ever produced. The company has now gathered its most powerful carbide grades under one name: PowerCarbide. The range offers a combination of strength, hardness, toughness and wear resistance, which significantly enhances both drilling performance and cost effectiveness.

The Sandvik PowerCarbide family currently consists of the grades DP55, DP65, GC80, SH70, XT49, XT70 and XT90. The company said new grades will be launched and added to the family as it continues to develop the range. All Sandvik products with PowerCarbide inserts will have a PowerCarbide symbol to differentiate them from the company's standard carbide products. ■

Website: [www.rocktechnology.sandvik](http://www.rocktechnology.sandvik)



Sandvik has gathered its most powerful carbide grades under one name: PowerCarbide. The range offers a combination of strength, hardness, toughness and wear resistance, thus enhancing both drilling performance and cost effectiveness.

## Sandvik supports digitalisation of construction projects

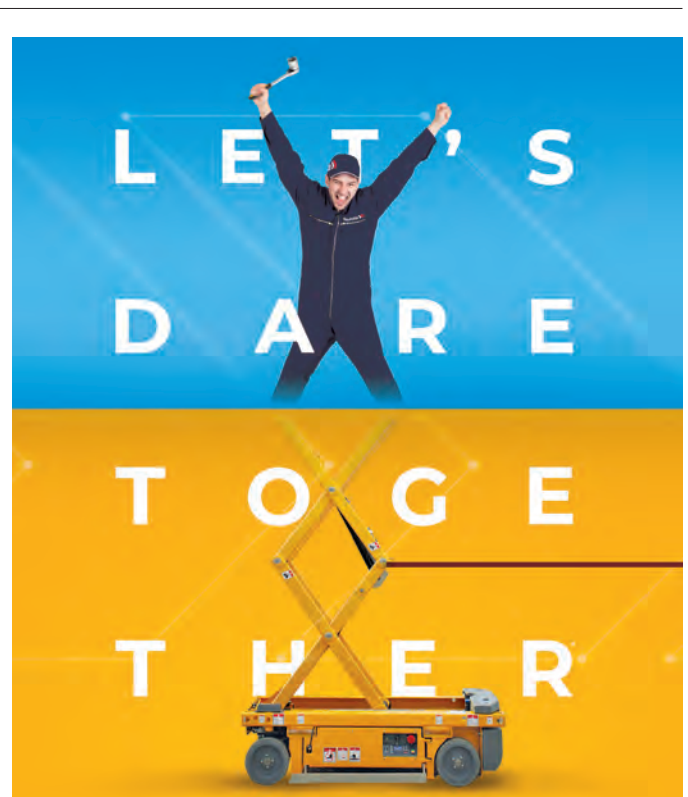
Sandvik Mining and Rock Technology has introduced connectivity between SanRemo remote monitoring system for Sandvik surface drilling equipment and Infrakit Cloud, a solution for connecting work machinery, field equipment and personnel on a single platform for more efficient construction, better quality, real-time accessibility of project data and cost savings.

The new solution creates a flow of communication between Sandvik drilling equipment, the SanRemo information management system and Infrakit Cloud. This way, the process data generated by onboard automation and TIM3D drill navigation systems can be easily shared with contractors' and civil engineering companies' other systems. With this new solution, data only needs to be uploaded once from the rig, after which it is automatically shared into the Infrakit Cloud.

A major benefit is the ability to share project data with all the relevant systems and parties: design engineers, drill planners, drill operators, production managers, client's supervisors, to name a few. Everyone can also easily access the information they need on-site.

Data generation on the drill rig is built on the Sandvik TIM3D drill navigation system. TIM3D allows pre-designed drill plans and surface models to be uploaded onto the drill rig, and even to be created or edited on the rig. During and after drilling, the rig stores as-drilled information, driller's notes, and Measurement While Drilling (MWD) data for reporting, quality control and downstream process planning.

The connection between SanRemo and Infrakit Cloud is created by a cloud-to-cloud connection, building on API (Application Programming Interface) technologies. The drill rig connectivity is based on mobile data via GSM networks. The current pilot solution enables push of data from SanRemo to Infrakit Cloud. Uploading options already existing in SanRemo will be made possible in the future through Infrakit Cloud as well. ■



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## GCP waterproofing system for Thailand's 'largest aquarium'

Aquaria Phuket is set to be the largest aquarium in Thailand, slated to open this year. Aquawalk Thailand Co Ltd, the company that owns and will operate the aquarium, has commissioned Aquablu Technologies Sdn Bhd to design and build the aquarium, along with finding a high-performing waterproofing solution that would be safe for the marine life.

Located inside the Central Phuket megamall, the roughly 6,000-sq-m aquarium is expected to house some 25,000 marine creatures. It is also planned to become a working research and breeding centre, in addition to being a tourist attraction. The aquarium is partnering with Chulalongkorn University in Bangkok to research marine life.

When it comes to waterproofing, especially an aquarium, the biggest challenge is said to be delivering a solution that is safe for the marine life without compromising waterproofing integrity. For Aquaria, Aquablu wanted a high-performing durable solution that would address waterproofing vulnerabilities, offer flexibility in application and be easy to install.

After researching liquid waterproofing systems for the tanks at Aquaria, Aquablu selected several Silcor liquid-applied waterproofing products from GCP Applied Technologies. These include: Silcor Primer BS – fast-drying, single-pack modified polyurethane primer for elastomeric polyurethane membranes; Silcor 990 MP – two-part, fast-curing, pure polyurea, spray-applied elastomeric coating; and Silcor LM PU Sealant – one-part joint sealant based on proven polyurethane elastomer technology.

The Silcor system comprises liquid waterproof membranes, top coat, primers and detailing products. Its flexibility in application overcomes vulnerable joints and protrusions while delivering waterproofing integrity. With proper application, Silcor waterproofing can result in excellent adhesion to concrete and steel, and also offers flexibility through spray as well as trowel application.

The specially formulated Silcor liquid membrane incorporates advanced polymer resin to optimise product application and durability. It is a liquid system that cures rapidly to form a seamless, monolithic membrane fully bonded to the substrate. It is highly durable with excellent wear and chemical resistance to enable long-lasting waterproofing protection.

The Silcor liquid-applied waterproofing system in ocean blue and blue black were applied on two of the largest tanks at Aquaria to provide marine-strength protection. The durable Silcor system, fully bonded to substrates, eliminated water migration and prevented water tracking. The elastomeric system is also able to accommodate structural movements and offers excellent resistance against wear and abrasion. Applied by spray or hand, this has allowed Aquablu to boost productivity and achieve daily coverage application to speed up the construction process.

With a wide application temperature and humidity range, the Silcor liquid system provides a seamless, continuous waterproof barrier on the tanks to ensure waterproofing integrity. It is also available in low volatile organic compound grades, making it safe for animals. ■

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

ALL IMAGES: The Silcor system from GCP Applied Technologies has been chosen by Aquaria Phuket to provide a high-performing waterproofing solution, which is also safe for the marine life. Scheduled for opening this year, Aquaria Phuket is set to be the largest aquarium in Thailand.



# Bauer joins Orange metro line project in Bangkok

The MRT Orange Line in Bangkok, Thailand, is currently underway. In the future, this will complement the existing MRT network and provide a link between the eastern suburbs of Bangkok and the city centre.

Thai Bauer Co Ltd - the local subsidiary of Bauer Spezialtiefbau - was recently commissioned by the project's contractor, the Joint Venture Ch. Karnchang – Sino Thai, to carry out various specialist foundation engineering works for the construction of the new metro line. More than 370 bored piles with diameters of between 800 and 2,000 mm are being drilled to a depth of between 40 and 65 m, and approximately 58,600 sq m of diaphragm wall with a width of 800 to 1,000 mm are being constructed down to a depth of 27 m.

Thai Bauer highlighted some of the challenges on the project. One of them is that extremely stringent tolerances for the installation of the bored piles have to be kept, while work is required to be carried out above existing tunnels - so great care and accuracy are essential for the success of this project.

In addition, during rainy season, the stability of the subsoil and access to the site need to be ensured, said Bauer. Also, the logistics between the steel processing locations and the respective application areas must be regulated, and access to the



Thai Bauer carries out specialist foundation engineering works for the new MRT Orange Line in Bangkok. More than 370 bored piles with diameters of 800 to 2,000 mm are being drilled to a depth of between 40 and 65 m, and about 58,600 sq m of diaphragm wall with a width of 800 to 1,000 mm are being constructed down to a depth of 27 m.

construction site via the main road must always be available.

Work started in March 2018, and the completion of Thai Bauer's specialist

foundation work is planned for early 2019. The completion of the new Orange Line is expected to take place in 2022. ■

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



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## Hillside hauling in NZ with Terex Trucks TA300s

The small coastal town of Omapo is located on the east side of New Zealand's North Island, approximately 57 km east of Opoiki. Here, Gaddum Construction has been carrying out a hauling project on the steep slopes of Omapo Forest. The company, which specialises in the construction of infrastructure on challenging terrain, has been using two TA300 articulated haulers from Terex Trucks to shift metal, logs and end material for road-building.

Operating safely at such extreme inclines on wet surfaces would be impossible for most machines, but not for the Terex Trucks TA300. According to Gaddum Construction, having on-board scales really helps the operator utilise the truck at its capacity, without any compromise to safety or machine performance.

For the operator, Terex Trucks' light system is also excellent. It features bright LEDs mounted to the rear of the cab, letting the excavator operator know when the material being loaded is within the TA300's maximum 28-t payload range, eliminating guesswork. The hauler's ability to brake in very wet conditions is also impressive, particularly from a safety perspective, added Gaddum Construction.

With steep, muddy terrain, Omapo Forest presents a series of challenges in terms of operator comfort – but the TA300 can handle it. Gaddum Construction said that the machine's adjustable air seats and the underpinnings of the articulated haulers help keep the operator centered and level over rough ground.

Gaddum Construction was established in 2006. Today, it employs around 25 people and carries out projects across Omapo Bay, Whakatane, Rotorua, Taupo, Thames and the Coromandel. The company purchased its two TA300s from Porter Equipment, the official Terex Trucks dealer in Australia and New Zealand since 2017.

Manufactured in Motherwell, Scotland, the TA300 offers a maximum payload of 28 t and a heaped capacity of 17.5 cu m. It is equipped with a Scania DC9 engine, giving it the power to perform in challenging conditions, such as those in the vertiginous hills of Omapo Forest. As well as being robust, the TA300 has been designed to be comfortable. It is fitted with true independent front suspension as standard to enable excellent traction control and operator comfort,



ALL IMAGES:  
The TA300 is helping Gaddum Construction to move metal, logs and end material for road-building. The hauler offers a maximum payload of 28 t and a heaped capacity of 17.5 cu m.

ensuring maximum productivity in the most challenging conditions. An upgraded heating, ventilation and air conditioning (HVAC) system, adjustable armrests and

heated seats all help to make the Terex Trucks articulated hauler as comfortable as it is powerful. ■

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

# Haulotte helps build new art centre in Dubai

Haulotte is currently involved in the construction of a new art centre in Dubai. The company's distributor in the UAE, United Gulf Equipment Rentals, has supplied five units of Haulotte HA41 PX articulated booms to be used on site during the entire project phases.

Airolink Building Contracting LLC was assigned by MMS Gulf as the main contractor for this project. The centre is set to become the first specialised mall in the GCC region dedicated to uniting the furniture market and will host brands ranging from medium-end to high-end.

The Haulotte HA41 PX articulated booms have been built to meet the needs of customers who specialise in technically complex and sustainable projects. The machine's design makes it possible to reach more diversified work areas, thanks to a working height of 41.5 m, up to four simultaneous proportional movements, and a horizontal outreach of 20.1 m to access areas that are really difficult to reach. ■

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



ALL IMAGES: United Gulf Equipment Rentals has provided five units of Haulotte HA41 PX articulated booms for a new art centre project in Dubai. The machine features a working height of 41.5 m and a horizontal outreach of 20.1 m.

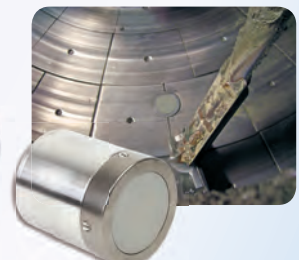


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# MAPEI 'SHIELDING' STEEL FROM CORROSION

MAPEI PROVIDES A RANGE OF SOLUTIONS FOR GALVANIC CATHODIC PROTECTION AGAINST STEEL CORROSION IN REINFORCED CONCRETE. THEY CONSIST OF MAPESHIELD I, MAPESHIELD S AND MAPESHIELD E 25, WHICH ARE QUICK AND EASY TO INSTALL, DO NOT REQUIRE EXTERNAL ENERGY SOURCE AND ARE MAINTENANCE FREE.

These galvanic cathodic protection systems utilise Mapeshield reactive anodes, which form a galvanic cell with the steel and thus become passive due to the difference in potential generated between the two metals once they are connected.

The anodes are made from zinc, which is considered less noble than steel. They will be gradually corroded over the years and guarantee that the structure is protected from corrosion for a long time - up to 40 years for new structures and up to 20 years for repaired structures.

The Mapeshield systems can be used in many areas, including prefabricated reinforced concrete structures; beams and columns; floor slabs in raised car parks; front edges of balconies; concrete floors; piles, abutments, friezes, kerbs and floor slabs on bridges and viaducts; general reinforced structures, particularly those exposed to aggressive environments such as the sea; and beams, pillars, piles and steel tanks.

## Mapeshield I

These pure zinc anodes with a coating of special conductive paste are designed for use on rebar in concrete. The system is well suited to protecting reinforcement rods against corrosion in both new structures and structures that require repair work.

Mapeshield I must be attached to the reinforcement rods before repairing the structure with mortar from the Mapegrout range or before casting the concrete on new structures.



ABOVE: The Mapeshield I pure zinc anodes with a coating of special conductive paste are designed for use on rebar in concrete.

TOP AND BELOW: Mapeshield I being applied on a structure under repair.



The system is made up of a multi-layered zinc core with a large surface area, covered with a special conductive paste that keeps the system active over the years. After connecting Mapeshield I to the reinforcement rods with metallic stays, a difference in potential is created between the steel and the zinc, which stops corrosion and impedes its formation, even if the surrounding environment is aggressive.

Mapeshield I is available in two different lengths and four different masses, making it suitable for various structures. The surface that the anode is capable of protecting depends on its size (the bigger the anode, the larger the area it protects) while the mass, which is proportional to the amount of metal it contains, effects its duration.

Mapeshield I is compliant with the EN 12696 European standard 'Cathodic protection of steel in concrete'.

### Mapeshield S

These self-adhesive zinc plates can be applied directly on the external surface



TOP AND ABOVE: Applying Mapeshield I on a new structure.

TOP AND ABOVE: Mapeshield I was used to repair concrete at the Sha Tin racecourse in Hong Kong.

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of metal structures that are exposed to atmospheric conditions.

When Mapeshield S is applied on a metallic structure, it forms an electrical interface between the surface to be protected and the zinc, thus transforming it into a galvanic anode that protects the structure from corrosion, even if the surrounding atmosphere is aggressive.

Mapeshield S is available in 50-m-long rolls at a width of 100, 200 or 300 mm. The zinc plate must be applied on the entire surface of the structure that requires protection. Once the plate has been applied, no other operations need to be carried out because contact with the structure is guaranteed by the adhesive.

Mapeshield S conforms to the UNI 10781 standard 'Requirements of self-adhesive zinc tape, application methods and checking the dressing coat'.

### Mapeshield E 25

These self-adhesive zinc plates can be applied directly on the external surface of concrete. To ensure the system is active, it must be connected to the reinforcement with a simple metal cable.

Once Mapeshield E 25 is connected, a difference in potential is created between



The Mapeshield S self-adhesive zinc plates can be applied directly on the external surface of metal structures that are exposed to atmospheric conditions.

the steel and the zinc, which then stops corrosion and impedes its formation even if the surrounding environment is aggressive.

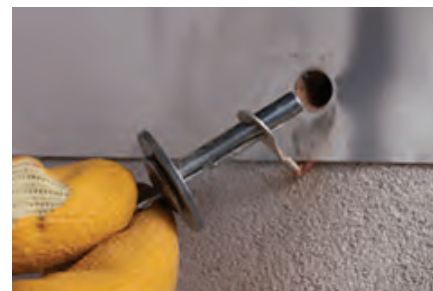
The degree of protection depends on the density of the reinforcement in the structure. On heavily reinforced structures, Mapeshield E 25 must be applied on all the surface requiring protection. If the density of the reinforcement is low, the distance between the plates may be increased up to a maximum of 50 cm.

Mapeshield E 25 is also compliant with the EN 12696 European standard 'Cathodic protection of steel in concrete. ■

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



The Mapeshield E 25 self-adhesive zinc plates can be applied directly on the external surface of concrete.



ABOVE: To ensure the Mapeshield E 25 system is active, it must be connected to the reinforcement rods with a metal cable.

BELOW: Applying Mapeshield E 25 directly on the external surface of concrete.



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# CHINPAOSAN NECROPOLIS CEMETERY

In the north of Taiwan, about 40 minutes from Taipei, the ChinPaoSan Necropolis cemetery is being extended with two new buildings: an arrival hall that will house tombs, a ceremonial place of worship, an auditorium and small museums; and a pavilion, which can accommodate up to 1,000 people on feast days.

The pavilion – named Oceanic Pavilion – features an iconic design combining pools of water with monumental, half cutaway spherical surfaces. The spherical shapes are said to symbolise the circle of life and the infinity of time, while the element of water achieves aesthetic closure.

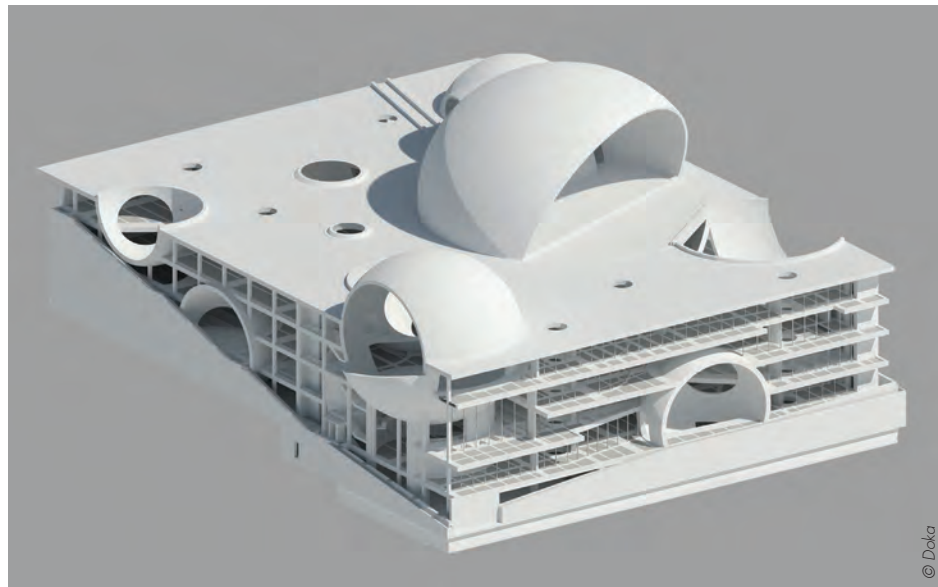
ChinPaoSan Ltd (the developer) – which is also carrying out the construction work - has appointed Steven Holl Architects as architect on the project. The structural engineer is Guy Nordenson & Associates, with the local structural engineer TH Tsai & Associates. Transsolar has been commissioned as climate engineer, while Heng Kai Inc as mechanical engineer.

## Formwork solution

For construction of the arrival hall and the pavilion, Doka is supplying its formwork systems plus services from project management through logistics to on-site formwork instructor. The Doka systems chosen include the Top 50 large-area formwork, Framax Xlife framed formwork and Dokaflex timber-beam floor formwork.

Made-to-measure custom formwork built by the Doka Pre-assembly Service is also provided for the special spherical shapes. “Specifically, the angles of the conjunctions points between the spheres are unique and present artistic impulses from an architectural perspective,” said Tung-Ho Tsai, head of ChinPaoSan PCM consultancy. “Paradoxically, the simplicity of the design makes the construction complicated and challenging. However, Doka’s experienced engineering team met all the requirements from the architect. Additionally, the high safety standards are fulfilled.”

According to Doka, a 3D model was



used during formwork planning in order to simplify the job. The points covered include the orientation of the profiled timber formers, the make-up of the formwork sheeting, and the ways and means of assembling the formwork.

Doka came up with a plug-in system, which was specially designed for the formwork of any 3D shapes. Timber formers, manufactured as a system of push-fit elements, are the basis for the free-form curving 3D formwork surface, explained Doka. The geometry data for these timber formers are transferred directly to the

CNC (Computerised Numerical Control) spindle moulders and routers in the Doka Pre-assembly Service workshop. The push-fit system enables the timber formers to be locked together quickly and securely. Production is more efficient and assembly faster, said Doka, because less training is needed for the personnel.

Doka’s Dokaflex tables, TLS table lifting system and H20 formwork beams are also used in the project. Construction work started in 2014, and it is reportedly still ongoing. ■

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



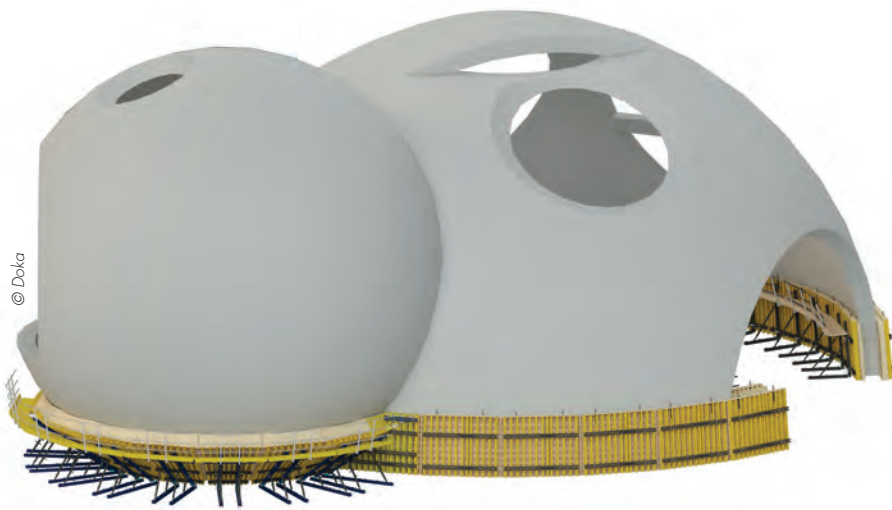
© Steven Holl Architects

**ABOVE:** The ChinPaoSan cemetery in Taiwan, about 40 minutes from Taipei, is being extended with two new buildings - an arrival hall and a pavilion.

**OPPOSITE PAGE:** The new Oceanic Pavilion features a distinctive design, which combines pools of water with monumental, half cutaway spherical surfaces.

**BELOW LEFT:** The new arrival hall is destined to house tombs, a ceremonial place of worship, auditorium and small museums.

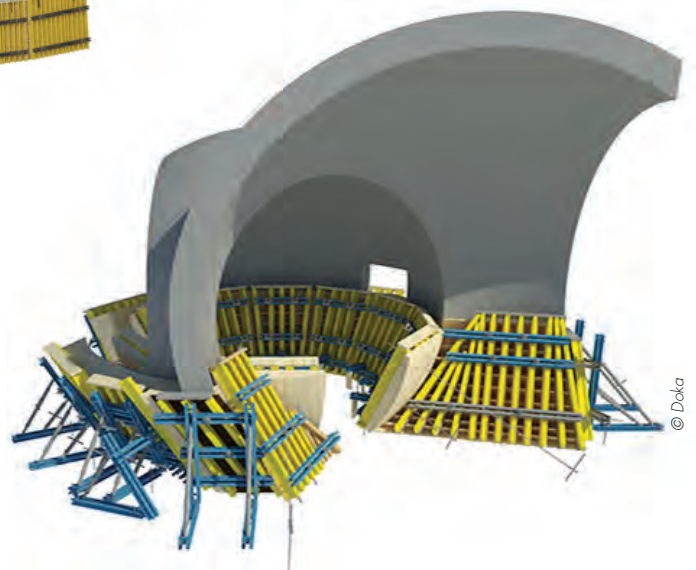
**LEFT AND BELOW:** Made-to-measure custom formwork built by Doka is used for the spherical shapes of the pavilion. This formwork system is planned using a 3D software.



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# AUCKLAND CONNECTION

**WITH THE VISION OF MAKING AUCKLAND ONE OF THE WORLD'S MOST LIVEABLE CITIES AND ALSO TO EASE GROWING TRAFFIC CONGESTION, THE NEW ZEALAND GOVERNMENT AND AUCKLAND COUNCIL ARE CURRENTLY BUILDING THE AUCKLAND CITY RAIL LINK (CRL). THE PROJECT IS SCHEDULED FOR COMPLETION IN 2024.**

The 3.5 km long double-track rail tunnel underneath Auckland's city centre, between the Britomart Transport Centre and Mount Eden Station, is a key project in Auckland's integrated transport programme. The CRL will provide more reliable and faster public transport options, especially as the city's 1.7 million population is projected to increase by another 1 million over the next 30 years.

Once completed, the CRL will become New Zealand's first underground passenger railway and expected to ease traffic congestion. The project was initiated by Auckland Transport, which appointed Aurecon as its technical advisor in 2013 to develop the reference design, obtain the necessary land designation and resource consents for the project, complete detail design of early works and assist with procurement of construction contracts.

In 2016, the Auckland Council and the government agreed to jointly fund the CRL and established the company City Rail Link Limited (CRL Ltd) to deliver the project. CRL Ltd continues to employ Aurecon as its technical advisor for construction procurement and support services.



TOP AND ABOVE: A view of the Auckland City Rail Link (CRL) project. When completed, it will become New Zealand's first underground passenger railway and expected to ease traffic congestion.



ABOVE, ABOVE RIGHT AND BELOW: One of the challenges on the project is that the design of the tunnels and stations has to navigate a web of utilities in the busiest parts of the city, including a 100-year-old immovable sewer line.



### City constraints

The CRL is said to be a heroic feat of civil engineering being executed by a combination of New Zealand and international consultants and contractors. The design of the tunnels and stations has to navigate a web of utilities in the busiest parts of the city, including a 100-year-old immovable sewer line, explained Aurecon. The historic Central Post Office building, which is located on soft soils in an old marine reclamation, has been underpinned to enable construction of cut-and-cover tunnels below it that connect to the existing Britomart Station.

Another challenge facing the design of the CRL is its relatively steep vertical alignment, revealed Aurecon. The tunnels rise continuously at a grade of approximately 3.5% from Britomart Station to the portals at Mt Eden. In most cities, with relatively flat underground rail alignments, the tunnel ventilation systems are bidirectional so that smoke arising from a fire within the tunnels can be pushed/pulled in either direction depending on the location of the fire.

For the CRL, Aurecon pointed out that directing smoke downhill would be problematic – the tunnel ventilation fans would have to fight the hot smoke's natural tendency to rise up the tunnel incline. Therefore, a unidirectional tunnel ventilation system was designed and modelled to demonstrate a train fire event can still be safely managed. Aurecon worked closely with the client and regulatory authorities to obtain their agreement to this unconventional solution.



Construction of the CRL is still ongoing, and the project is scheduled for completion in 2024.

### No ordinary rock

As part of the CRL project, Aurecon conducted geotechnical investigations to understand the underlying ground conditions beneath downtown Auckland. The company also prepared 3D geological models for parts of the CRL alignment as part of a broader task for data integration and visualisation. Engineers later used the findings and information to develop reference designs.

The massive drilling programme removed 3,000 m of core samples from 127-cored boreholes, said Aurecon. If laid end to end, it is believed that the samples would cross the 1,020-m-long Auckland Harbour Bridges three times. The geotechnical investigations revealed a mixture of volcanic rock, sandy sediment, soft reclamation material and groundwater. Most interestingly, the drilling programme discovered a 10-m layer of hard sandstone under Karangahape Road, thought to have been formed as a channel-fill deposit on a submarine fan 20 million years ago, according to Aurecon geologist Philip Kirk.

### Double S: Safety and Systems

Aurecon also provided system engineering and safety assurance services for the CRL, including safe design, to support the project's objective of an acceptably safe railway.

A rigorous process of hazard identification and management was undertaken in collaboration with key project stakeholders including Auckland Transport, KiwiRail and Fire Emergency New Zealand. System assurance was undertaken within the process framework provided by EN 50126-1: 2017.

Aurecon introduced the use of DOORS (Dynamic Object-Oriented Requirements System) to manage the project requirements. The company said it is the first time this tool has been used on a major rail project in New Zealand.

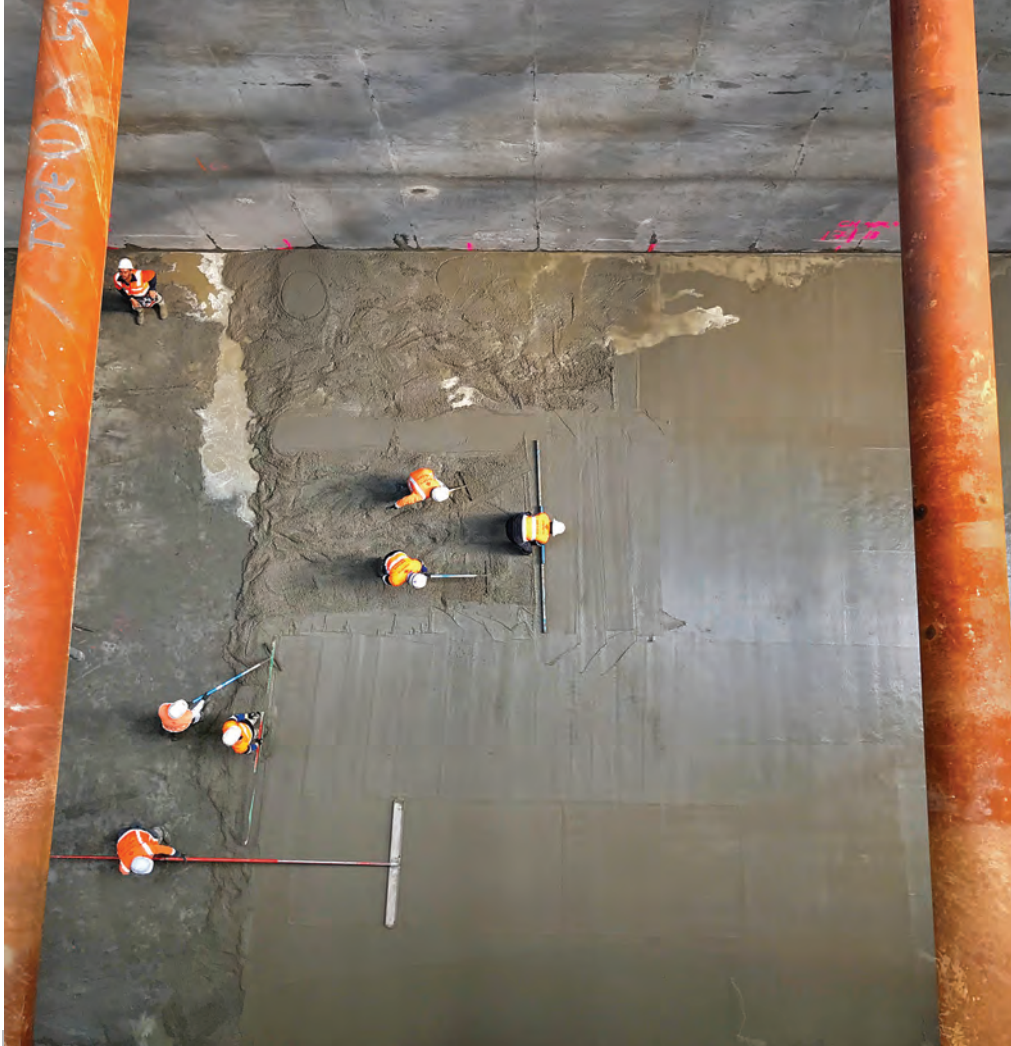
**Transforming transportation**

Upon completion, the CRL reportedly will allow trains to pass through most Auckland stations every five to 10 minutes at peak times. Commuters on the Western Line could save as much as 15 minutes of their travel time into the centre of Auckland.

Quicker journeys will also provide a whole new level of connectivity for areas beyond the project. According to Aurecon, the city is already seeing some of these areas being revitalised with new housing and development projects underway in anticipation of the improved transport connections.

Aurecon added that together with its architectural partner, Jasmax, the company worked collaboratively with the Mana Whenua Forum – representatives of the local Maori tribes – to create designs for the three new stations that express local cultural narratives. Features such as dramatic structural cross braces within Aotea Station allude to the woven ‘tukutuku’ panels found within marae meeting houses. The station designs provide a sense of place and will enhance the customers’ experience.

“As a Kiwi who spent 17 years overseas working on major passenger rail projects. I had the good fortune to return to New Zealand and work on the Auckland CRL – a major metro project in my hometown,” said Grant Daniel, Aurecon’s technical director. “I am passionate about sustainable transport and hopefully my contribution to this city-shaping project will help many Aucklanders to reduce their dependency on cars to get around the city.” ■



ABOVE AND BELOW: **Once operational, the CRL is expected to allow commuters on the Western Line to save as much as 15 minutes of their travel time into the centre of Auckland.**



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# BAUER SETS NEW RECORDS IN MALAYSIA PROJECT

**B**aUER (Malaysia) Sdn Bhd - the local subsidiary of Bauer Spezialtiefbau GmbH - has won a contract for a new project in Kuala Lumpur. It was awarded by Arena Merdu Sdn Bhd, a subsidiary of KLCC Holding Sdn Bhd, which is owned by Petronas, the Malaysian National Oil Company.

Bauer will be carrying out diaphragm wall and piling works for the new skyscrapers in lot 164, lot 165 and lot 166 at the KLCC (Kuala Lumpur City Centre) until July 2019. This development consists of a four-storey basement car park, five-storey shopping centre and an office tower.

What is so special about this project is the pile depth, revealed Bauer. Out of a total of 225 contracted piles, 137 piles for the tower feature a diameter of 2,500 mm and have been designed to be constructed to a depth ranging from 90 to 150 m.



ABOVE AND LEFT: Bauer Malaysia will be carrying out diaphragm wall and piling works for the new skyscrapers in lot 164, lot 165 and lot 166 at the Kuala Lumpur City Centre until July 2019. This development consists of a four-storey basement car park, five-storey shopping centre and an office tower.

“These are currently to my knowledge the deepest piles ever made in Malaysia,” said Egon Stahl, general manager of Bauer Malaysia.

Prior to start of piling at each pile position, a soil investigation is performed to determine both the competency of the bedrock level and the pile toe level. “Only then can the actual drilling begin,” said Mr Stahl. Two further ‘records’ are needed to reach the depths required for the bored pile: a BG 72 – Bauer’s largest rotary drilling rig to date – and a five-fold Kelly bar that is 150-m-long will be used.

“The project is thus a record in three aspects: Bauer is doing drilling work for the deepest piles to date in Malaysia, with what is currently Bauer’s largest drilling rig and the world’s longest Kelly bar,” concluded Mr Stahl.

In addition to the deep tower piles, 88 units of 2,000 mm bored piles up to a depth of 75 m for the shopping complex area, and a basement retaining diaphragm wall with a thickness of 1,000 mm and a depth of 38 m will be constructed. Apart from Bauer BG 72, a BG 48 with a 125-m-long Kelly bar is also being used for the piling works. ■

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



RIGHT: A Bauer BG 72 drill rig, equipped with a five-fold Kelly bar, is used to install piles up to a depth of 150 m.

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Steel Centre Philippines has chosen a Grove GMK4100L all-terrain crane to help install a 28-m footbridge in eastern Manila, where it serves as a walkway for pedestrians to cross the busy streets.

# MANILA CALLING

Steel Centre Philippines, a specialist in the design, fabrication and erection of steel structures, has used a Grove GMK4100L all-terrain crane to install a 28-m footbridge in the Philippines. Working for Metropolitan Manila Development Authority, a government agency, the company positioned the 20-t bridge in just 30 minutes. The new footbridge sits in Ortigas Avenue, a major thoroughfare in Pasig City, located in eastern Manila, where it serves as a walkway for pedestrians to cross the busy streets.

“The GMK4100L is a very flexible crane that’s easy to mobilise and demobilise; it handled the bridge project with ease,” said Irvin Ong, vice president of operations at Steel Centre Philippines.

Steel Centre Philippines has two GMK4100L all-terrain cranes, one GMK3055 all-terrain crane, plus an RT760 rough-terrain

crane. The GMK4100L cranes are currently working on other projects for the company. One is constructing a new subway station, while the other is working on the Athletic Stadium in New Clark City. The new stadium is expected to feature in the upcoming South East Asian Games, which will take place in the Philippines in November 2019.

The 100-t-capacity GMK4100L has a 60-m main boom that can extend to a maximum height of 89 m when working with its jib. It has been replaced in the Grove line by the new generation GMK4100L-1. This unit has the same 100-t- capacity and 60-m main boom, but is more compact than its predecessor with greater flexibility in configuration. ■

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



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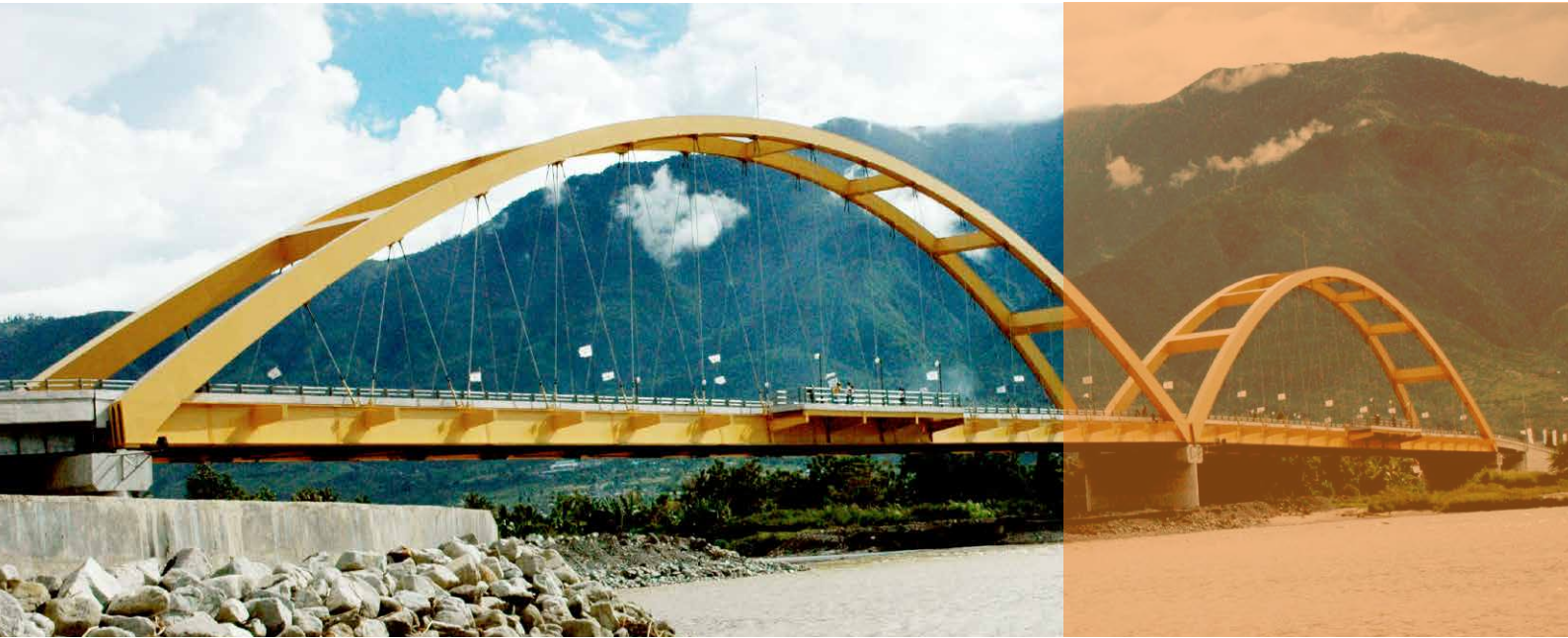
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# ROAD SMART

In September 2018, the city of Palu on the Indonesian island of Sulawesi was hit by a 7.5-magnitude quake, which affected millions and killed thousands of people, along with damaging homes and infrastructure. As part of the effort to improve road conditions in the city and the rural surrounding areas, local company PT Sapta Unggul is working to lay asphalt for new road surfaces.

The company has opted for an ABG5820 tracked paver from Volvo Construction Equipment (Volvo CE) to do the job. Originally on site to support the Indonesian government's effort to improve the transport network in Palu, the machine is now deployed to help rebuild roads.

"There is great demand for smoother and safer roads in Palu and its surrounding areas," said Ruddy Chandra, director of PT Sapta Unggul, a road contractor based in Palu. "Volvo's ABG5820 paver offers high paving efficiency. Plus, the job is easier thanks to the paver's electronically-controlled travel drive, which ensures uniform propulsion, straight-ahead travel and exact cornering."

On site since November 2016, the ABG5820 paver works between eight to 10 hours daily and has already paved 124 km of road in the region. "We really appreciate the machine's high paving speed and easy-to-control system because we have to close the roads for some projects, so it was important for us to complete the project on time," said Mr Chandra.

PT Sapta Unggul purchased the ABG5820 paver from PT Intraco Penta Prima Servis (IPPS), Volvo CE's distribution partner for the Sulawesi region. The machine has an 8-m paving width and an electronically-controlled independent travel drive fitted to each crawler unit. This system monitors track movement and controls the motor response accordingly, ensuring both straight line and fixed radius paving.

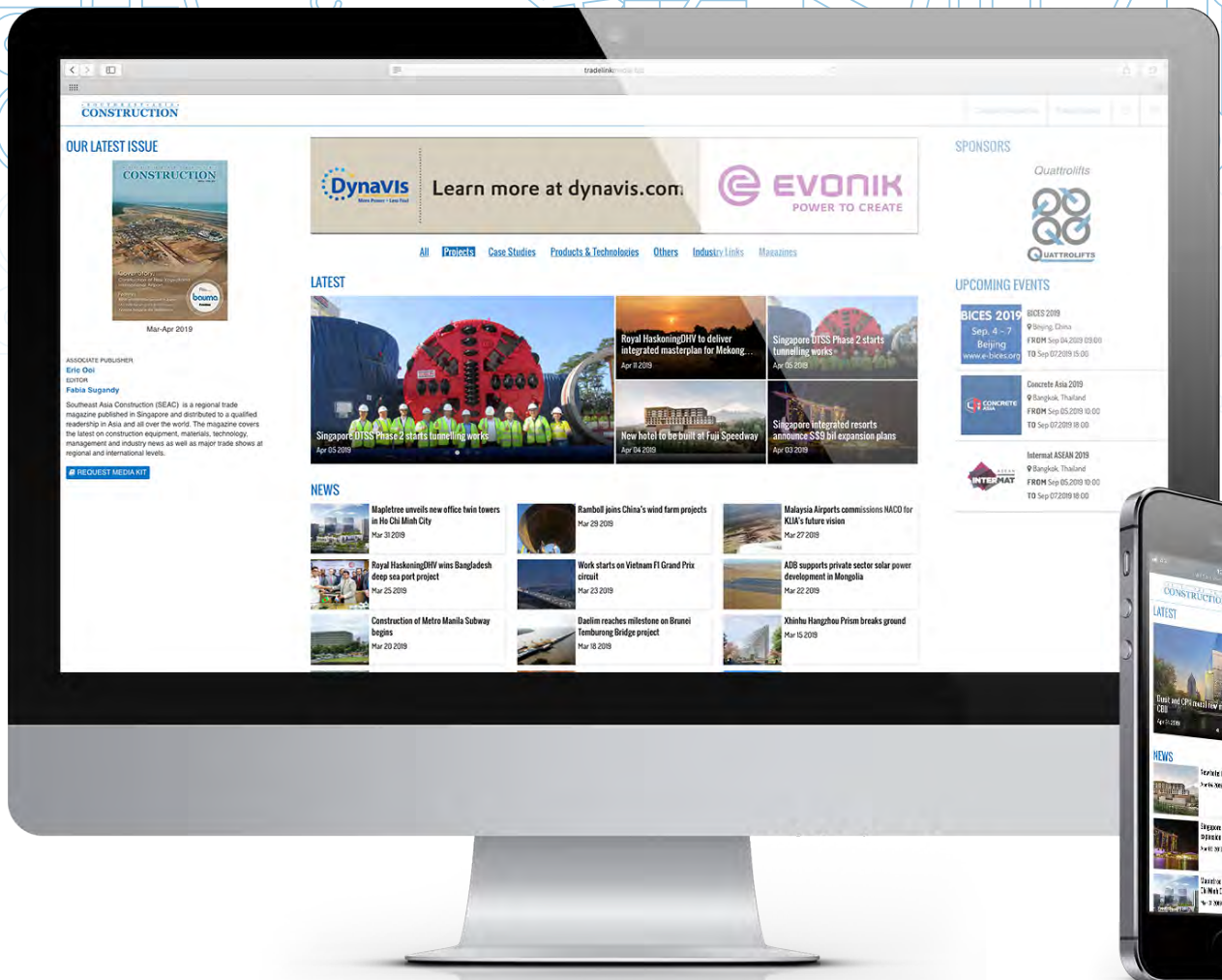
PT Sapta Unggul owns a fleet of over 50 heavy construction equipment, including five Volvo machines: an ABG5820 paver, an SD110B soil compactor and three EC55B pro compact excavators. ■

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



ALL IMAGES:  
PT Sapta Unggul has deployed its Volvo ABG5820 tracked paver to help lay asphalt for new road surfaces in Palu, Indonesia, as part of the effort to improve road conditions in the city and the rural surrounding areas.

# OUR WEBSITE HAS A FRESH NEW LOOK.





# WOC CELEBRATES 10-YEAR HIGH

The 44th World of Concrete (WOC) has exceeded expectations across the board and concluded as the largest edition in over a decade. This signature annual event for the international concrete and masonry industries drew 60,511 registered professionals and featured more than 1,500 companies (including 259 brand new companies), covering more than 776,800 net sq ft (72,167 sq m) of exhibit space. The show took place from 22 to 25 January 2019 at the Las Vegas Convention Centre, Nevada, USA.

"This year has been a very successful event - World of Concrete 2019 attendees, both domestic and international, experienced the newest products, technologies and educational offerings," said Jackie James, group director of World of Concrete. "Having our largest event in 10 years proves that the construction sector is strong globally. The education programme was well received with





a 5% increase in attendance. We want to thank all the exhibitors and attendees who made WOC a must-attend event for 2019, and we look forward to a successful WOC 2020!"

Kevin Archibald, show manager of World of Concrete added, "We are very excited with the results. The positive energy indicates a strong year ahead. This year brought in record breaking attendees, exceptional exhibits, and a very solid rebook rate of just over 538,000 net sq ft (49,982 sq m) of exhibit space, rebooking 70% of the total 2019 square footage onsite for next year's show."

Highlights of the 2019 edition included the Bob Weatheron Award established by World of Concrete to honour his contributions to the concrete industry. The award includes a US\$2,500 scholarship and was presented at the CIM National Board Meeting at WOC 2019. This year's recipient of the Weatheron Award was Paige Silva, who attends California State University - Chico.

The 17th Annual Spec Mix Bricklayer 500 World Championship brought in crowds full of spectators from across the globe. A total of 27 bricklaying teams travel from all over North America and Australia to Las Vegas to compete for the title World's Best



Bricklayer. This year's winner Mason - Mario Alves – A&M Masonry, Hamilton, Ontario with the help of Tender – Kevin Avila took home the coveted title and went home with over US\$120,000 in cash and prizes, including a 2019 Ford F-250 4x4 truck and a John Deere Gator Crossover Utility Vehicle.

Concrete Industry Management (CIM) is a business programme that has been developed specifically for the concrete industry to provide students with a four-year Bachelor of Science degree in Concrete Industry Management. The programme gives students entering the concrete workforce industry experience early in their careers.

CIM held its 14th annual unreserved silent and live auctions at WOC 2019. The silent and live auctions raised gross revenues of US\$1.2 million, setting a record for funds raised at the show, and bringing a total of over US\$10 million to the CIM programme in the past 14 years.

The next edition of WOC is scheduled to return from 4 to 7 February 2020 (seminars from 3 to 7 February), at the Las Vegas Convention Centre. ■

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



ALL IMAGES: Scenes from World of Concrete 2019, the largest edition of the show in over a decade.

The following pages cover some of the exhibitors and their products that were introduced at the World of Concrete 2019.

## SMARTROCK

Among product offerings from Giatec Scientific is SmartRock, a mobile-based wireless sensor that is fully embedded in fresh concrete to monitor its in-place temperature and strength during construction. It helps construction companies to build structures quickly, safely and efficiently.

The sensor can be easily installed in the concrete formwork (on the rebar) before pouring to monitor in-situ temperature and concrete maturity according to ASTM C1074. The wire-free logger continuously records the measured temperature of any concrete pour in real-time. These results are analysed automatically on-site (to determine the in-place concrete strength) using the free SmartRock app (available for Android and iOS).

SmartRock is suitable for various applications, such as formwork removal timing; post-tensioning; optimising curing conditions; saw cutting; controlling quality in the field; monitoring temperature gradients in mass concrete; and opening roads to traffic. According to Giatec, SmartRock has been used in a wide range



ABOVE AND LEFT: SmartRock is a rugged, mobile-based wireless sensor that is fully embedded in fresh concrete to monitor its in-place temperature and strength during construction.

of projects all over the world, across 80 countries.

Software programmes available with SmartRock include: real-time data display (e.g. temperature, strength, max-min values, and graphs); maturity calibration database; free Android and iOS apps for smartphones and tablets; project management tools including live data sharing; full PDF reporting and CSV data exporting; Giatec 360 cloud dashboard (user/data management, predictive

analytics, and more); and integration with project management applications (e.g. Procore).

The user-friendly sensor also features wire-free and wireless technology, rugged and waterproof design, easy installation and activation by tying the wires together, extended temperature sensor cable for mass concrete, long battery life, and cloud dashboard. The product is currently patents pending. ■

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

## EVOQUIP

EvoQuip's Cobra 230 impact crusher uses a fuel-efficient and high-performing direct drive system to power the machine. This, along with the two independent hydraulic controlled aprons, allows the operator to optimise the material throughput and reduction whilst ensuring the best fuel efficiency.

The rapid set-up time and intuitive control system on the Cobra 230 enables the operator to be crushing quickly after unloading the machine from the lorry. The operator can also adjust the crusher setting easily without the need for any tools via the user-friendly hydraulic assist that is standard on the machine.

There is a number of key design features in the Cobra 230, which ensure an optimal material flow through the crushing process. As material moves from the feeder through the impactor onto the product belt, each section becomes wider resulting in an unrestricted flow. The excellent under crusher clearance, the short distance from the crusher discharge to the magnet, and the ability to lower the product conveyor while running make the Cobra 230 an ideal machine for various applications.

Serviceability has been integral throughout the design and development of the Cobra 230. With ground level access to the engine, hydraulics, service and refuelling points, it ensures maintenance is easy for the operator. This is further enhanced with features such as the hinged radiator pack and hinged diesel tank. Having a compact footprint, the Cobra 230 is simple to transport and also suitable for working in urban areas.



EvoQuip's Cobra 230 impact crusher.

According to EvoQuip, its machines can come directly to the site to crush and screen the waste from the demolition projects. When customers are not farming they can use EvoQuip equipment to demolish old farm buildings, process material for lanes, driveways or drainage projects. EvoQuip added that certain models in the range can even be transported on an agricultural trailer, and are able to overcome access issues on narrow lanes, country roads and remote access sites. ■

Website: [www.terex.com/evouquip](http://www.terex.com/evouquip)

## BROKK

The new Brokk 170 is one of the company's next generation remote-controlled demolition robots. With SmartPower — Brokk's signature intelligent power management system — this new machine offers 15% more power than its predecessor, the Brokk 160, but retains the same compact dimensions.

The SmartConcept system ensures improved performance and uptime, consisting of three features: SmartPower, SmartDesign and SmartRemote. SmartPower senses when the power supply is poor or faulty then compensates before damage to components occurs. This allows contractors to use the machine with generators or unreliable power sources.

SmartDesign extends machine life and provides unprecedented ease of maintenance due to 70% fewer cables, hardened components, LED headlights and easily accessible grease points and hydraulic hoses. SmartRemote - an ergonomic remote control - incorporates adjustable straps, intuitive controls and professional-grade radio technology with a 300-m working range.

The Brokk 170 is equipped with a 205-kg BHB 205 hydraulic breaker to deliver 406 joules with each blow. The machine can be paired with a wide variety of attachments for added versatility, including buckets, clamshell buckets, concrete crushers, grapples and metal shears.

As with all Brokk machines, the Brokk 170 offers superior reach and movement. The three-part arm extends to 4.8 m vertically and 4.4 m horizontally. The machine also features 360 degrees of continuous rotation for optimal versatility on the jobsite.

In addition, Brokk 300 is another model in the company's new range of remote-controlled demolition robots. This machine features 40% more demolition power than its predecessor, the Brokk 280. It also boasts Brokk SmartConcept technological features that improve power management, reliability, maintainability and ergonomics.

Like its predecessor, the mid-sized Brokk 300 is just 1.2 m wide, but can handle larger attachments weighing as much as 500 kg. With Brokk's new SmartConcept system, operators also experience improved performance and uptime. The Brokk 300 offers exceptional reach and movement. The three-part arm extends to 6.5 m vertically and 6 m horizontally. The arm also rotates 360 degrees for optimal flexibility.

Each Brokk 300 is outfitted with a BHB 455 hydraulic breaker that delivers 855 joules of hitting power. The machine also pairs seamlessly with beam grapples, clamshell buckets, concrete crushers, demolition and scoop buckets, drills, drum cutters, metal shears, planers, rock splitters, shotcrete nozzles, sorting grapples and rock splitters. ■

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



Brokk 170 (above) and Brokk 300 (below).



## SOKKIA

Sokkia's iM-50 manual total station features a prism range of up to 4,000 m and up to 500 m in reflectorless mode with a 1.5 mm/2 ppm accuracy. The company said the unit also offers a rapid distance measurement of 0.9 seconds regardless of the target.

The iM-50 has an integrated Bluetooth technology for connectivity with the controller. Additional features include 50,000 points of internal memory, or up to 32 GB USB flash drive external support, SDRbasic on-board software, and IP66 certification for operation in tough jobsite conditions.

In addition, Sokkia's next generation of software solution for total stations, robotics

and GNSS rover systems - GeoPro Field 2.0 - is designed to improve design and user experience.

Among the new features of GeoPro Field 2.0 include new options for field-to-finish automation. Furthermore, new visual background map capabilities are supported by Bing Maps as well as WMS (web map service). Other features include enhanced support for a broad array of file types including import from Autodesk Point Layout. ■

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



RIGHT: Sokkia's iM-50 manual total station.

# TEREX

Terex Advance Charger front discharge mixer truck is equipped with a newly designed cab, which will be fitted on all models in 2019. The new cab is designed as a mobile workspace to enhance the total driver experience. The interior has been refreshed with strategic placement of controls in logical groupings and within easy reach of the operator.

Extra space in the cab has been provided for storage, and more charging ports have been added for electronic accessories. The new cab also has a wider windshield, providing increased visibility for the driver along with improved ergonomics, rear ventilation windows, superior windshield wiper sweep, and improved HVAC coverage.

In addition, Terex Bid-Well 4800RC roller paver offers a remote-control feature, allowing the operator to control the machine from the ground/work area. This provides increased safety as well as the ability to communicate with other team members and more importantly with the concrete placer. The 4800RC is capable of paving bridge decks, flatwork and roads with minimal set up time and increased flexibility. ■



Terex Bid-Well 4800RC roller paver.

Website: [www.terex.com/concrete](http://www.terex.com/concrete)

# MINNICH

The Stinger electric flex shaft concrete vibrator from Minnich Manufacturing is a 6.6 kg double-insulated universal motor that can drive the full line of Minnich vibrator shafts and heads from 1.9 to 6.35 cm. Available in a 115-V version, it offers a more compatible speed range of 11,000 to 13,000 vibrations per minute (VPM) to meet today's concrete placement challenges.

The unit comes standard with a quick disconnect that adapts to the vibrator shafts and heads of many other manufacturers. A durable protective frame extends vibrator life with urethane end caps that absorb shock while supporting easy-to-grip handles.

The Stinger delivers quiet operation, meeting Occupational Safety and Health Administration (OSHA) A 29 CFR 1910.95 standards. Its double-insulated motor runs safely when grounded systems are compromised.

In addition, the Minnich Auto Vibe vibrator monitoring systems for paving machines can monitor, control and programme hydraulic vibrator speeds during the paving process for excellent concrete surface results.

The Auto Vibe II monitors up to 62 hydraulic vibrators during the paving process, recording and displaying real-time data that can be used to ensure proper vibrator operation. Readings are recorded by time, distance travelled, or at the push of a button. Reports can be generated after the data is imported from a USB drive. The system can be installed on any new or existing hydraulic vibrator system.

The Auto Vibe III monitors and records VPM data just like Auto Vibe II with the added feature of controlling and maintaining the vibrator VPM at the monitor instead of at the manifold. Once the VPM speed is set, the monitor communicates with the manifold and automatically makes adjustments to maintain desired speeds. ■

Website: [www.minnich-mfg.com](http://www.minnich-mfg.com)



ABOVE: Minnich Auto Vibe vibrator monitoring systems.



LEFT: Minnich Stinger electric flex shaft concrete vibrator.

# LIEBHERR

The Liebherr 50 M5 XXT concrete pump incorporates the latest technologies and capabilities, lowering the overall weight and optimising product dimensions. It is the largest unit in the truck-mounted concrete pump range from Liebherr. The multi-folding, five-section boom is easy to operate with excellent kinematics. The alternating pipework close to the boom ensures uniform movements over the construction site.

The 50 M5 XXT has a vertical reach of 49.1 m and a horizontal reach of 44.4 m. The slewing ring and drive are proprietary components that play a crucial role in its performance. The machine features a powerful pump unit that delivers an output of up to 163 cu m/hr. Two of these variants are long-stroke versions with a conveyance stroke of 2,000 mm, which is particularly smooth and efficient.

Another model, the Liebherr 37 Z4 XXT truck-mounted concrete pump is equipped with a high-performance pump unit, which delivers a maximum flow rate of 138 cu m/hr. Smooth changeover of the S-pipe is facilitated by the hydraulic cylinder with end-of-stroke damping.

The 37 Z4 XXT pipeline is located close to the boom on the left and right-hand sides, guaranteeing a balanced weight distribution. The curved pipe of the concrete pipeline exiting the bucket has a large radius of 275 mm, ensuring minimal losses in pressure over the length of the distributor boom.

All of the Liebherr concrete pumps feature the XXT narrow support outriggers, which are designed to be extremely stable and warp-resistant. The front and rear support arms are affixed directly to the distributor boom pedestal, which directs the forces from the boom into the supports directly without deviations. The four support arms are pivotable and enable high flexibility and a wide working range for the distributor boom on narrow supports. This is considered an added benefit on construction sites with limited space.

Chassis from various truck manufacturers can be used as the underbody for Liebherr truck-mounted concrete pumps. A high-pressure cleaner makes cleaning easier and a pneumatic hose end air cuff prevents concrete from running out when the pump unit is stopped.

A wide range of optional accessories and equipment are available for both the 37 Z4 XXT and 50 M5 XXT. Customers can choose from more storage compartments, a modular water tank or additional steps on the left hand side.

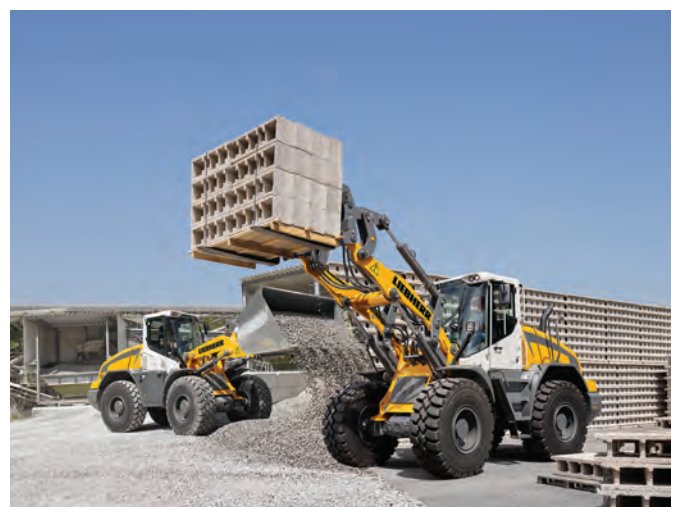
In addition, the Liebherr L 538 wheel loader is a highly versatile machine suitable for various applications. It can be used for many tasks, from concrete applications to earthmoving or material handling through the use of different attachments.

This wheel loader features a standard Z-bar linkage, achieves a tipping load straight of 10,300 kg at an operating weight of 13,900 kg, is powered by a 114 kW Tier 4f diesel engine and equipped with a 2.60 cu m quick hitch re-handling bucket with bolt on cutting edge.

According to Liebherr, the L 538's efficient hydrostatic driveline provides fuel savings of up to 25% in comparison with wheel loaders of the same size class. The Liebherr Power Efficiency system (LPE) optimises the interaction between drive components by adjusting the engine for every working situation, delivering maximum power at low engine speeds, enhancing the efficiency of the wheel loader.



Liebherr 50 M5 XXT (above) and 37 Z4 XXT (below) truck-mounted concrete pumps.



Liebherr L 538 wheel loader.

The Liebherr mid-size wheel loaders are built to be powerful, reliable and efficient all-rounders. They comprise three models: the L 526, L 538 and L 546. ■

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

# GOMACO

The Gomaco GT-3600 curb and gutter machine is now available with the company's Xtreme system. It was the first three-track machine to slipform a 610 mm radius, and now with the Xtreme system on board, tight radius paving can be performed more easily and efficiently. The Xtreme system adds G+radius software with slew drives, smart-sensored hydraulics and intelligence to the Gomaco GT-3600.

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

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

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

The Xtreme GT-3600 is equipped with the latest in Tier 4 technology. There is also a new enhanced cooling package with a hydraulic fan controlled by G+. This G+ adapts the cooling needs to individual jobsite conditions for a quiet and efficient operation. Fuel efficiency has also been optimised and combined with an increased fuel capacity for an uninterrupted day of paving. Plus, the Xtreme GT-3600 is available with Gomaco Remote Diagnostics (GRD) for machine troubleshooting, diagnostic reviews, software updates, and more.

The Gomaco Xtreme Commander IIIx was also displayed slipforming a tight radius curb and gutter application, while the Gomaco 3300 was set up as a right-side pour curb and gutter machine.

The Gomaco GT-3200 is now equipped with G+ controls and a rotary sensed slew drive on its front track for maximum turning capabilities and accuracy while slipforming with a compact curb and gutter machine. It was revealed for the first time at the WOC 2019.

Gomaco's smallest curb machine, the Curb Cadet, also made an appearance at the show. Concrete slipform placing and paving was highlighted with the Gomaco RTP-500 rubber-tracked placer and the GP3 intelligent slipform paver. Rounding out Gomaco's exhibit was a C-450 cylinder finisher for bridge deck and flat slab applications. ■

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



FROM TOP: Gomaco GT-3600, 3300 and Xtreme Commander IIIx machines.

# WIRTGEN

One of the highlights at the Wirtgen booth was the company's newly developed AutoPilot 2.0. This 3D control system is designed to produce any kind of offset and inset profiles; it also creates a new, digital data model on site. Wirtgen supplies the AutoPilot 2.0 for two slipform pavers - the SP 15/SP 15i and SP 25/SP 25i. The system can also be retrofitted to existing machines.

The AutoPilot 2.0 can be used for making concrete safety barriers, curbs, traffic islands, or for road surfaces with a width of up to 3.5 m. The advantage is that surveying as well as setup and dismantling of string lines is no longer necessary, and the lines no longer get in the way of the teams working around the paver, said Wirtgen. As a result, the overall process is more productive and profitable.

Wirtgen's versatile multipurpose offset pavers – the SP 15/SP 15i and SP 25/SP 25i - are ideal for paving high quality monolithic profiles. The offset moulds can be positioned on either side of the machines, within or outside the chassis. In addition to paving a diverse range of offset profiles, the SP 25/SP 25i can also be used as an inset paver, placing narrow pavements, such as golf and bicycle paths. Transport poses no problem due to the machines' compact design.

With the Wirtgen SP 60 series - consisting of the SP 61/SP 61i offset slipform paver and both the SP 62/SP 62i and SP 64/SP 64i inset slipform pavers - Wirtgen complements the offset SP 15/SP 15i and SP 25/SP 25i series. For inset slipform pavers, the SP 60 series for medium pave widths between 2,000 mm and 7,500 mm closes the gap between the small- and medium-sized models and the larger SP 90 series.

The SP 64i slipform paver was displayed at the WOC 2019. Concrete slabs in widths between 2 m and 7.5 m with a paving thickness of up to 450 mm can be paved with high precision using this machine.

Wirtgen also offers the self-propelled, track-mounted TCM 180/TCM 180i texture curing unit. The modular design of this machine permits working widths between 4 m and 18 m. The TCM 180/TCM 180i can create different surface textures using one single system to meet all requirements, apart from the well-established functions of transverse brushing and spraying, and longitudinal brushing and spraying; even a diagonal finish is possible. Meander spraying is an option, which enables transverse spraying during uninterrupted travel.

Wirtgen has integrated a hot-water system with a 90-l tank in the TCM 180/TCM 180i. With this system, curing agent adhering to the inside of the pipes can be completely removed with water up to 60°C in temperature. Another feature of the machine is the lateral brush-cleaning unit. It removes slurry build-ups, which adhere to the brush during changes of direction when applying a transverse brush finish.

In addition, Kleemann introduced its Mobirex MR 130 Z EVO2 mobile impact crushing plant, which is aimed for demolition concrete recycling and aggregate production. The plant is designed for simple transport and can be quickly ready for operation. The diesel-direct drive concept also ensures high performance with economical consumption at the same time.

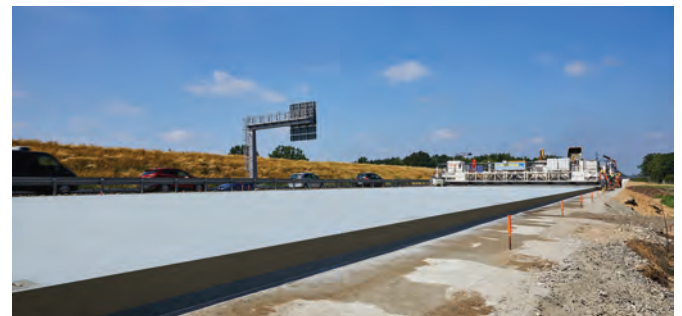
The plant is controlled via a 12-in touch panel based on Kleemann's Spective control concept. This simplifies the operation of the plant, as all functions are recognisable at a glance and clear symbols point the way. Thus, operating errors can be avoided and



With the Wirtgen AutoPilot 2.0, the Field Rover measures the virtual string line support points.



Wirtgen SP 64i slipform paver.



Wirtgen TCM 180i texture curing machine.



Mobirex MR 130 Z EVO2 impact crusher from Kleemann.

occupational safety improved. Fast relocation of the plant can be achieved by the extended radio remote control Quick Track. With the plant running, a direct switch from crushing operation to driving operation and vice versa is possible. This increases the plant performance and reduces waiting time. ■

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

# ELEMATIC

Elematic's new automatic Plotter E9 makes hollow core slab production process fast and accurate, resulting in substantial cost savings. It comes with a simple touch screen panel that meets the needs of the machine operator. The plotter is used to mark cutting lines, rectangles and circles for openings and reservations as well as identification texts and codes on the cast slab surface. It also marks places for dividers and fittings on an empty bed surface. Both longitudinal and crosswise text printing can be achieved.

A new level of plotting accuracy is reached through a direct transfer of slab design details file from the design software (such as Tekla Structures BIM) to the Plotter's FloorMES machine control system. The transfer takes place via a wireless remote link connection without any manual interventions, which removes the risk of human errors from this stage in the process. Further improving the plotting accuracy is the continuous laser positioning along the casting bed. The accuracy of the laser is +/- 1 mm.

Plotter E9 is operated via a 15.6-in touch screen panel designed to meet everyday plotting tasks in precast concrete plants. The screen shows the slabs on beds, and on-bed quick re-planning allows the operator to check and edit the data on machine if needed, remove faulty slab sections, define a new starting point, and remove geometry.

The screen also shows work status such as start time, slab no., tasks and elapsed time, alerts and remaining battery power and ink levels. It is easy to use; users can zoom and drag and drop items similar to any other smart device. The user interface is available in English, Russian and Finnish as standard. Any other language is available as an option.

For safe operation, the plotter has light sensors on both buffers and also ultrasonic sensors. The machine stops automatically at any hinders on its way, and is equipped with light and sound alarms. No cables are needed as the plotter is battery-operated. A fully charged battery lasts 16 hours, or one to three days, depending on the beds and machine usage, said Elematic. Automated waterhole driller is available as an option.

There are several other features for easy maintenance of the machine. These include on-screen quick adjustment and calibration and clog-resistant print head. The machine is ready for remote troubleshooting and support via a WiFi link (network connection required). ■

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



TOP: Plotter E9 in operation.

ABOVE: The plotter is used to mark cutting lines, rectangles and circles for openings and reservations as well as identification texts and codes on the cast slab surface.

LEFT AND FAR LEFT: The plotter is operated via a simple touch screen panel.



# AQUAJET

Aquajet Systems has launched the Ergo System. This hydrodemolition robot is said to offer four times the power of a hand lance in a compact footprint that contractors can easily move around the jobsite. It is ideal for work on floors, walls and ceilings.

The Ergo System incorporates several features: the controller unit, which powers and controls the hydraulics; the Ergo Power Head, which manipulates the high pressure lance; and either the spine or the climber, innovative systems used to support and manoeuvre the power head, based on project needs. The climber attaches to any standard scaffolding pipes and robotically moves along it to deliver powerful hydrodemolition forces for vertical concrete removal and repair, such as high-rise construction.

The Ergo System exerts an impressive 1,000 N of reaction force, which is about half of the force employed by Aquajet's largest hydrodemolition robot, the Aqua Cutter 710V. According to the company, the Ergo System can handle higher volumes of water, as much as four times greater reaction force than a human operator with a hand lance, allowing the machine to remove concrete faster and easier.

Hydrodemolition robots, such as the Ergo System, are used to remove concrete to a preset depth consistently. Alternatively, a hand lance will likely leave inconsistent depths due to being held by an operator, said Aquajet, meaning that contractors may have to do another pass with handheld breakers to even out the surface.

Contractors can easily move the 123-kg Ergo Controller unit around the jobsite and over soft or rough surfaces, thanks to the wide wheels and low ground pressure. The system is also service-friendly with hydraulic hose multiconnectors that are 100% sealed from moisture to virtually eliminate the risk of leaks during transportation.

The Ergo System requires a high-pressure pump to operate. Aquajet offers a compact Power Pack ideal for the purpose, featuring a high-pressure Hammelmann pump, diesel engine and an integrated control system.

Aquajet has also launched the Ergo Spine attachment, which wields four times the water reaction force of hand lances, giving contractors a more powerful and safer alternative.

The Spine includes an Aquajet Power Head attached with a single bolt to a roller beam, which is connected to a spine roller mounted on a spine rail. Depending on the configuration, the setup may be supported by standard support legs, or the spine rail may be attached directly to a surface.

Aquajet manufactures the roller beam with a lightweight aluminium core coupled with a steel gear rack and guide rails. Beam sections are mounted together with a single bolt. The Ergo Spine roller features a low weight, high strength skeleton base with a wheel setup that divides forces for the ability to handle high reaction forces.

The spine rail is fabricated with high-strength aluminium, reducing its weight by half compared to steel. A 2-m rail weighs just 20 kg. Despite its lightweight properties, the rail handles the same reaction force as an entirely steel rail. The rail allows for quick connections with a single bolt for different brackets and tools.

The Ergo Controller's intelligent sensing controls automatically adjust and move the Power Head along the roller beam. Aquajet's high-pressure Power Pack, sold separately, provides water pressure and flow to the Power Head's lance and nozzle, creating a reaction force up to 1,000 N. The Ergo Power Head can tilt at up to a



**ABOVE: Aquajet Ergo System is a compact hydrodemolition robot.**



**LEFT: The Ergo System has hydraulic hose multiconnectors that are 100% sealed from moisture to virtually eliminate the risk of leaks during transportation.**



**BELOW: Aquajet Ergo Spine attachment.**

45-degree angle to attack the material efficiently and oscillates to get the best results for each job.

As the Power Head moves along the Ergo Spine, it removes concrete in sections as small as 0.25 m up to 2 m, leaving the rebar clean and undamaged. An Ergo Spine with a Power Pack producing 2,800 bar of pressure and 40 l of water per minute can remove an estimated 0.25 cu m of concrete per hour.

The Spine simplifies use as well as maintenance, and is highly portable. One person can carry and set up the unit and secure it with a single bolt, said Aquajet. All connection points are marked in red, and all bolt sizes on the unit are the same, ensuring easy replacements. Further, the wheeled controller measures just 1 m tall and 0.42 m wide, making it easy to get to the jobsite on a pallet and then move effortlessly around the site.

The Spine's standard setup easily tackles concrete walls, floors and ceilings while the side setup delivers hydrodemolition power to narrow spaces. ■

Website: [www.aquajet.se](http://www.aquajet.se)



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# DOOSAN

The Doosan DL200TC-5 wheel loader is designed for loading and carrying, and it has a parallel-lift linkage system. With increased visibility down the centre of the parallel-lift arms, operators can clearly see the ground, truck or work area in front of the machine when placing loads. The parallel-lift linkage system also keeps the work tool flat as it is lifted rather than rolling back, an advantage when lifting pallets and other loads that need to stay level.

The DL200TC-5 features a hydrostatic transmission, giving operators more power, improved fuel efficiency and better precision while working. Operators can choose between three power modes – power, standard and economy – that adjust the maximum engine rpm. Unique to the hydrostatic drive system, the engine rpm is not directly correlated to the machine's travel speed, so the maximum travel speed remains unaffected.

In addition, the operators can choose from three traction modes – max, traction control and S-mode – to easily adjust traction force to match jobsite conditions for more efficient operation in digging, stockpiling and loading applications.

The DL200TC-5 has an operating weight of 11.89 t, a bucket capacity of 2 cu m, a dump height of 2,685 mm and a breakout force of 95 kN. The wheel loader is available in a high-lift option for additional lift height and reach to more

easily load materials such as cement into high-sided trucks.

The Doosan DX140LCR-5 crawler excavator offers a shorter tail swing, allowing operators greater flexibility where space is a premium without sacrificing performance. The machine is designed for long life with an extra-sturdy frame and reinforced superstructure. It comes standard with permanently sealed and lubricated track links, and the workgroup bushings and hard-wear disks are designed for reliability as well as extended service intervals to increase uptime.

A standard 7-in LCD screen allows operators to continue monitoring the excavator parameters while viewing the rearview or sideview camera image. Critical machine data appears next to the camera view. With an available side camera, a split screen allows both camera displays to be viewed at once.

The DX140LCR-5 has an operating weight of 15.87 t; maximum digging reach (ground) of 8,530 mm; maximum digging depth of 5,985 mm and maximum loading height of 7,080 mm. Four power modes include power+, power, standard and economy; and four work modes comprise dig, lift, breaker and shear. ■



Doosan DL200TC-5 wheel loader (top) and DX140LCR-5 crawler excavator (above).

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

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