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# CONSTRUCTION

NOVEMBER - DECEMBER 2019



**Cover Story:**  
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**Features:**  
**Construction of roads in Bellary, India**  
**LiuGong battery electric vehicles**  
**Sandvik DT1132i tunnelling jumbo**

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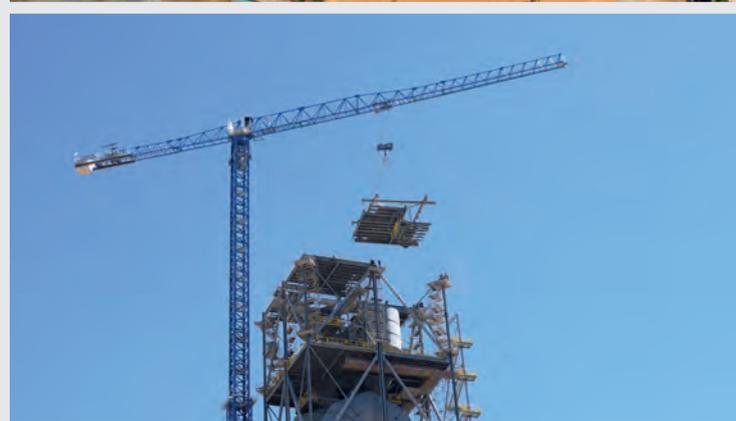
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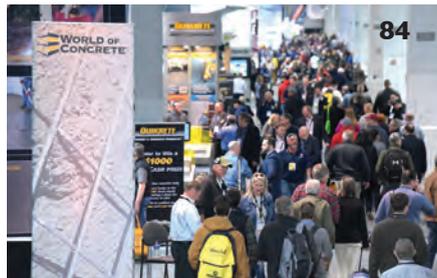
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# Singapore to redevelop Sentosa and Brani islands

Sentosa Development Corporation (SDC) has revealed its Sentosa-Brani Master Plan, a comprehensive blueprint that will be rolled out in phases over the next two to three decades. It will see SDC leveraging the islands' ridge-to-reef attributes to bring in world-class attractions as well as fresh and bold night-time offerings, while enhancing transport connectivity to and within the islands.

According to SDC, new spaces and concepts that are authentic and environmentally sustainable will also be created, including rejuvenated beaches and expanded nature and heritage trails. The redeveloped islands will feature five distinct zones, with each delivering its own 'experiences': vibrant cluster, island heart, waterfront, ridgeline, and beachfront.

"The Sentosa-Brani Master Plan is one of our tourism developments to position Singapore as a leading destination for the next few decades," said Senior Minister of State for Trade and Industry and Education, Chee Hong Tat. "Sentosa Sensoryscape is the first project under this master plan. It will complement the expansion of Resorts World Sentosa and subsequent infrastructure enhancements on Sentosa and Pulau Brani."

Mr Chee added, "Our tourism industry is doing well and still has plenty of scope for further growth and rejuvenation. It is one of our economic engines that can continue to create many good jobs for Singaporeans."

## Sentosa Sensoryscape

Construction of Sentosa Sensoryscape - the first project under the master plan - is scheduled to begin in the fourth quarter of 2019 and expected to complete by 2022.

Located at the heart of Sentosa Island, the new 30,000 sq m development will link Resorts World Sentosa in the north to



LEFT: A bird's eye view of the developments on Sentosa and Brani islands.

BELOW LEFT: A public waterfront promenade with Mount Serapong on the background.

BOTTOM LEFT: The expanded nature and heritage trails.

BELOW: Sentosa Sensoryscape will be the first project under the master plan.



All images © SDC

Sentosa's beaches in the south through a multi-sensory experience, replacing the existing pedestrian thoroughfare.

Sentosa Sensoryscape will have a series of vessel-like structures (about 25 m wide and 13 m high). Each of them will be framed by architectural features, and is set to pique and amplify one of the five senses through various elements such as polyphonic water features, mist, as well as fragrant flowers and plant species with unique scents.

SDC said that the redeveloped precinct will incorporate Universal Design principles to ensure easy access for all visitors, as well as feature breakout spaces and expanded vistas through new photo and lookout points overlooking the beaches.

SDC further mentioned that while works are ongoing for Sentosa Sensoryscape, visitors will be able to continue accessing and enjoying Sentosa's diverse array of leisure experiences. ■

## Amata signs agreement to develop Smart and Eco City in Yangon

Yangon Amata Smart and Eco City (YASEC), a subsidiary of Thai developer Amata Corporation PCL, and the Department of Urban and Housing Development (DUHD), Ministry of Construction of Myanmar, have signed a framework agreement to develop a Smart and Eco City in Yangon as well as the supporting infrastructure, logistics, services and other businesses related to the project. Under this agreement, DUHD will hold 20% of shares.

"YASEC will be the first sustainable Smart and Eco City

in Myanmar. The first phase development is proposed at 2,000 acres," said Yasuo Tsutsui, managing director of YASEC. "Amata believes that YASEC will meet all the conditions to become a sustainable city focused on providing an eco-friendly environment, quality employment opportunities, education, healthcare, commercial and recreating facilities all in one city. And the project will all be managed and controlled by the green and smart technology concept." ■

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# Crown Group plans vertical waterfront city for Jakarta

Australian developer Crown Group has unveiled its vision to build a new luxury waterfront residential precinct on the Jakarta waterfront, Indonesia. The development is said to be the first of its kind in the country, with 2,000 luxury homes and its own marina, beach club and dining precinct at Ancol.

Based in Sydney, Crown Group signed an agreement with Indonesian government organisation PT Pembangunan Jaya Ancol in mid-2018 to create the vertical city. The plans are scheduled to be presented to the Indonesian government for approval later this year, with the project set to be launched in 2020.

Real estate and tourism developer PT Pembangunan Jaya Ancol Tbk is best known for developing Ancol Bay in the 1980s, one of the largest tourist parks in Southeast Asia, which attracts 300,000 visitors a year. It boasts its own championship golf course, the 24-hour Ancol Dreamland amusement park, SeaWorld, various hotels, open-air markets and a marina.

Speaking about the new vertical city, Iwan Sunito, chairman and group CEO of Crown Group said, "The vision is to create a landmark that will be the jewel of Indonesia and a marina that the world hasn't seen before. We will be the first to bring waterfront living to Jakarta, inspired by the world's best - Sydney's famous Darling Harbour and Circular Quay - through the development of vertical mixed-use residences."

The A\$1 billion development will feature a series of towers on a 4.7-ha site, with a luxury waterfront living concept designed by Japanese-Australian architect Koichi Takada, who is based in Sydney. There will be a yacht club, waterfront promenade and beach club-style dining, among others.

According to Mr Takada, he had drawn on elements of Indonesia's natural environment and cultural heritage to create a



© Crown Group

Crown Group, in partnership with PT Pembangunan Jaya Ancol, plans to build a luxury waterfront residential precinct on the Jakarta waterfront.

contemporary development with a connection back to Indonesian culture. "The site is on the edge of the land, facing the Java Sea. As you fly into Jakarta, you see the Ancol development with its collection of eight high-rises that almost appear like an Indonesian archipelago, rising out of the sea," he said. "So, we looked to Raja Ampat Papua, the Indonesian archipelago off the coast of West Papua - known as the Four Kings - for inspiration, and the Green Canyon in Pangandaran Beach of islands.

The first phase of the project is expected to be completed in 2024 with 800 apartments, a gym, spa and infinity swimming pool, and a further 1,500 apartments in the second phase. ■

## Hyundai builds reliability assessment centre in South Korea

Hyundai Construction Equipment (HCE) has started the construction of its reliability assessment centre in Yongin, Gyeonggi-do, South Korea. This large-scale facility covers a total land area of 40,000 sq m situated at the Mabuk-ri Research Institute.

The project, with a total investment of KRW 77 billion, is intended to expand the company's operation of the evaluation laboratory previously operated in Ulsan to the reliability assessment centre, which will allow the integrated research from parts to finished products. It is expected to be completed in August 2020.

In particular, the reliability assessment centre will be equipped with a large laboratory that can check the performance of equipment in extreme environments from -40°C to 80°C, as well as simulators and advanced test and measurement equipment. Various researches and experiments will also be conducted at the facility such as eco-friendly technology, high efficiency, and noise reduction technology, to cope with tightening exhaust gas regulations.

"When the reliability assessment centre is completed, the preliminary verification from hydraulic and mechanical parts to finished products will be strengthened, and the quality competitiveness of finished equipment will be greatly improved. As trust and loyalty to our brand increases, it is expected that global market penetration will be accelerated further," said Kim Gwang-min, VP of the reliability assessment centre at HCE.



The groundbreaking ceremony for HCE reliability assessment centre in Gyeonggi-do took place in September 2019.

HCE is focusing its efforts on quality improvement by upgrading the quality division to the quality headquarters in January and allocating 35% of the total employees to the R&D department in August. ■

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# Sumitomo and BRG form JV to build smart city in Hanoi

Sumitomo Corporation and BRG Group Joint Stock Company have established a joint venture to develop a smart city in northern Hanoi, Vietnam. Located in the Dong Anh district, the 272-ha project is divided into five phases; Sumitomo will build the residential area with BRG in the first phase.

According to Sumitomo, there is a Hanoi Metro Line 2 extension plan from downtown Hanoi - going through the project area - to the Noi Bai International Airport, and a new station is also planned to be built within the project area. Sumitomo will implement the project by considering a transit-oriented development (TOD) centred on the new station.

When completed, the new smart city will offer hospitals, schools, disaster prevention facilities, security systems and commercial facilities, as well as lush greenery, water passage and a main street. Also, by introducing the 5G technology, face recognition system and blockchain technologies, the project will feature sophisticated smart city services, contributing to the sustainable development of Hanoi City.

Sumitomo said the project is expected to commence upon obtaining approval from Hanoi City for a partial revision to the master



An artist's impression of Phase 1 of the smart city development (surrounded by the red dotted line).

plan. Under its Medium-Term Management Plan 2020 initiated in April 2018, Sumitomo views social infrastructure as one of its growth areas and intends to place increased focus on urban development, smart city projects, and various infrastructure projects. ■

## Steel Carriers acquires 'first 1,200-t telescopic crane in India'

Mumbai-based Steel Carriers Infrastructure has acquired a Demag AC 1000-9 all terrain crane. It is believed to be the first and only company in India to own and operate a telescopic crane in the 1,200-t capacity class.

"The Demag AC 1000-9 is undoubtedly an outstanding crane in its class. All the more reason for us to be pleased that our long-standing and loyal customer Steel Carriers Infrastructure has acquired the first crane of this type in India. The AC 1000-9 will give Steel Carriers Infrastructure a decisive competitive advantage and enable the company to tackle even larger projects," said Norbert Dudek, director and head of Demag Business Asia.

"Steel Carriers has always been a loyal Demag customer and we look forward to



The Demag AC 1000-9 all terrain crane recently acquired by Steel Carriers Infrastructure Pvt Ltd is believed to be the first 1,200-t telescopic crane in India.

continuing our relationship with them," added Saeesh Nevrekar, head of Demag Business India.

"The AC 1000-9 will be helpful to clients ranging from refineries, petrochemicals, cement, fertilisers to civil projects, where height and space are limited," said Sunil

and Naresh Makad, owners of Steel Carriers Infrastructure. "Our new addition will reduce the mobilisation time and cost with all terrain manoeuvrability and robust build of the crane, it will be easy and quick to reach the worksite and set up the crane in comparison to big crawlers." ■

## Keppel Land to develop new mixed-use project in Nanjing

Keppel Land China Limited is forming a joint venture with Yincheng International Holding Co Ltd and a co-investor, Jiangsu Aidi Property Development Co Ltd, to jointly acquire and develop a 3.8-ha prime residential and commercial mixed-use development site in Xuanwu District, Nanjing, China.

The site has a gross floor area (GFA) of 99,248 sq m and can accommodate about 211 residential units, 342 commercial

units and 79 shop units. It is located in the Nanjing city centre, right next to the Xuanwu Lake and historic Ming City Wall. Phase 1 is planned to be launched in the second quarter of 2020 and the entire project is slated for completion in 2024. The estimated total development cost for the project is expected to be in excess of RMB 5 billion (approximately S\$990 million). ■

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# Manitowoc opens new facility in the Philippines

Manitowoc has opened a new 2,900 sq m facility in the Philippines to stock parts for Potain tower cranes - including popular models such as the MCR160, MCR225 A and MCT 205 - and also parts for Grove mobile cranes such as the RT530E-2, RT765E-2 and GMK6300L. Located in Molino, Cavite, south of Manila, it incorporates a warehouse and a workshop. Construction of the facility was completed in July this year and Manitowoc staff have already moved in.

“We want to provide the highest levels of support for our Grove mobile cranes and Potain tower cranes. The opening of this new warehouse is the latest example of our commitment to customers in the Philippines, following the expansion of our sales team earlier this year,” said Michael Macatangay, Manitowoc’s sales director for the Philippines.

An open house was held in August to celebrate the unveiling of the new facility, attended by over 40 customers. Cranes on display at the event included the Potain Hup 32-27 self-erecting tower crane, Grove RT530E-2 rough-terrain crane and GMK3060 all-terrain crane.

The Hup 32-27 self-erecting crane offers a maximum capacity of 4 t and can lift 1 t at its jib end. It has a hook height of 27 m and a jib of 32 m, and customers were able to see demonstrations of this crane during the open house.

The 60 t capacity GMK3060 combines a powerful, six-section Megaform boom that features the new boom configuration mode to save time at the jobsite and make set-up easier. The crane was also the first



LEFT AND BELOW: The Grove RT530E-2 rough-terrain and GMK3060 all-terrain cranes (left) and Potain Hup 32-27 self-erecting tower crane on display during the open house.

BELOW LEFT: The event also saw handover ceremonies to celebrate deliveries to two customers.



from Manitowoc to feature its Crane Control System (CCS). For the RT530E-2, maximum capacity is 30 t and its four-section, full power boom is formed of 100 k.s.i. steel to reduce weight while maximising structural capacities. It is also equipped with CCS.

Apart from seeing the models on display and live demonstrations of the Hup 32-27, there were handover ceremonies to celebrate deliveries to two customers – Port-Link Container Yard Corporation and

P.A. Alvarez Properties & Development Corporation.

“The demonstration of the Hup 32-27 crane was really useful. The jib was unfolded in front of us and we could witness first-hand how fast and easy it was to operate the crane. We are excited with our purchase of the Hup 32-27 and are certain this Potain crane will help improve the efficiency and reliability of our work,” said John Go, president at Port-Link Container Yard Corporation. ■

## Bangkok MRT Blue Line extension starts operation

Bangkok’s MRT Blue Line extension has officially begun its operation. By extending the existing line from Hua Lamphong to Lak Song, this new railway line will be able to accommodate up to 500,000 passengers per day, alleviating the heavy traffic congestion in the Samphantawong district (Bangkok Chinatown) and significantly improving access to this district for the public.

Arup served as lead consultant on the project. The company was working with Italian-Thai Development PCL (ITD) on Contract 1 for two underground stations, Wat Mangkon and Sam Yot (locally known as Wang Burapha) and two intervention shaft structures in the centre of Chinatown, covering various services including civil and structural, geotechnics, architecture,

building services, alignment, fire engineering, tunnel ventilation and passenger movement analysis.

Arup said that a brand-new look with multi-storey above ground buildings incorporating entrances, concourses and retail areas has been given to Wat Mangkon and Sam Yot stations to reflect the architectural shop house style of the Rama V period, bringing new elements as well as aesthetic design to the existing MRT stations.

According to Arup, the Blue Line extension also has one of the deepest underground stations in Bangkok, with its formation level of the base slabs at approximately 26 to 30 m below ground level and are ground bearing on the aquifer sand and clay. ■

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# Hyperloop project 'supports growth in Maharashtra'

As India moves to create the first hyperloop project in the world, Virgin Hyperloop One (VHO) has released new jobs figures for the entire project verified by KPMG, a strategic partner, estimating that it will provide more than 1.8 million direct and indirect jobs in the region through the development of a hyperloop route.

The proposed hyperloop directly addresses all key targets of the new Industrial Policy unveiled in April 2019, which intends to make Maharashtra a trillion dollar economy, and the project would directly or indirectly promote nine out of 14 'thrust sectors' identified by the new policy.

Based on the released figures, the total project will attract an investment of over INR 70,000 Crore over the duration of construction. Throughout its lifetime, the project will create over US\$36 billion in socio-economic benefits resulting in a 2.6% increase in State GDP, and offer new hyperloop component and manufacturing opportunities for Maharashtra to supply projects within India, and export to the rest of the world.

Employment projections for the project take into account the jobs created via construction, operation, manufacturing and research and development over the life of the project. The figures take into account direct jobs (those directly related to hyperloop project development activities) and indirect jobs (upstream industry sectors that support the hyperloop project).

"The Pune-Mumbai Hyperloop Project is well on its way to becoming the first of its kind transit option, creating new economic opportunities for hundreds of millions of Maharashtra residents. But that's just the beginning," said Harj Dhaliwal, managing director of India and the Middle East for Virgin Hyperloop One. "We envision a future in which Maharashtra becomes a global supply hub to support hyperloop projects around the world with manufacturing, design, and engineering support services – making it not just hyperloop's first home, but a global leader for the first new mode of mass transportation in over 100 years."

For the Mumbai-Pune Hyperloop Project, VHO has proposed a two-phased approach, with the construction of an 11.8 km demonstration track, followed by Phase 2 that would build the rest of the 100 km hyperloop system connecting Pune with Mumbai,



© Virgin Hyperloop One

**If approved, the Pune-Mumbai hyperloop route could become the first hyperloop project in the world.**

with the option to add a stop at the proposed Navi Mumbai International Airport.

The Government of Maharashtra has reportedly deemed hyperloop a public infrastructure project, recognising hyperloop technology alongside other more traditional forms of mass transit and setting it up to be the first hyperloop project in the world. The MahaIDEA Committee also earlier approved the Virgin Hyperloop One-DP World (VHO-DPW) Consortium as the Original Project Proponent (OPP) for the Pune-Mumbai Hyperloop Project.

There are approximately 75 million passenger journeys between Mumbai and Pune annually – expected to skyrocket to 130 million by 2026. According to VHO, the hyperloop system can meet this growing demand by supporting as many as 200 million passengers per year, linking central Pune and Mumbai in less than 30 minutes, as opposed to the current 3.5+ hours. This ultra-high speed linkage not only opens up new economic and social opportunities but also offers a sustainable form of mass transportation with zero direct emissions.

The Government of Maharashtra is said to be finalising the hyperloop infrastructure project Request For Proposal (RFP) and is expected to invite bids for the RFP under the MahaIDEA Act for infrastructure projects. ■

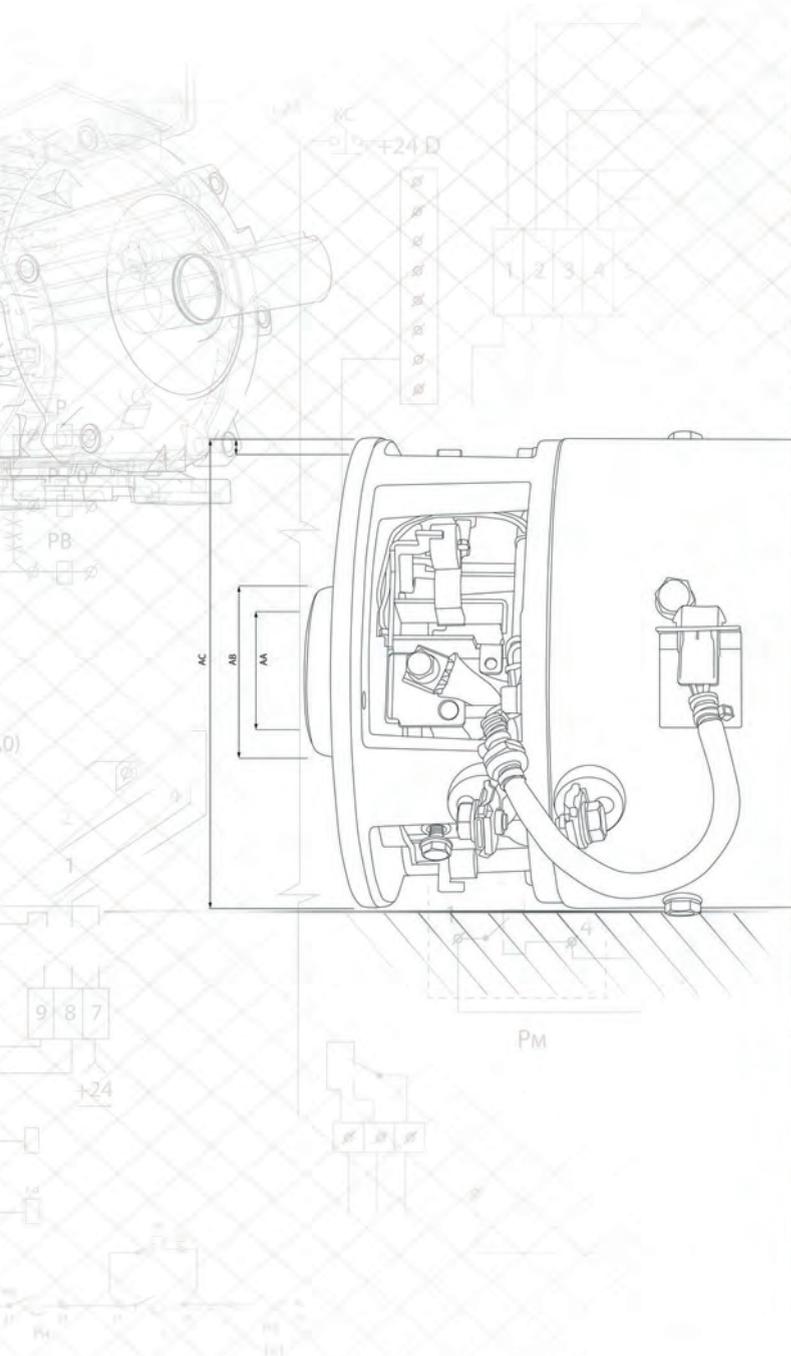
## Jacobs to work on New Manila International Airport project

Jacobs has been selected by San Miguel Corporation (SMC) as programme management consultant for the New Manila International Airport (NMIA) project in the province of Bulacan, the Philippines.

One of the largest and most ambitious infrastructure projects in the country, the entire development includes construction of a new terminal, four runways and airport support facilities spread out over almost 2,500 ha. When complete, the airport will be able to accommodate up to 100 million passengers per year and is expected to significantly ease passenger and air traffic congestion at Manila's existing Ninoy Aquino International Airport.

SMC is said to be investing approximately US\$14 billion into the project with the first phase to be operational within six years. The programme management services to be delivered by Jacobs during planning, design and construction phases include project scoping and management, contract development, strategic advisory, design management and scheduling and financial planning.

"The Philippines is changing," said Ramon S. Ang, president and COO of San Miguel Corporation. "Our economy and our aspirations for the future are growing. The new airport hub will provide more and better livelihood opportunities for our people." ■



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# New urban redevelopment project in Tokyo unveiled

Japanese developer Mori Building Co Ltd has begun work on the Toranomon-Azabudai District Category 1 Urban Redevelopment Project in central Tokyo, Japan. It is scheduled for completion in March 2023.

The massive development, totalling approximately JPY 580 billion, will cover an area of approximately 8.1 ha. It will have 213,900 sq m of office space, 1,400 residential units, retail facilities with around 150 shops, a 120-room hotel, an international school (approximately 14,000 sq m), and about 9,000 sq m of cultural facilities. Some 25-30 million people per year are expected to visit this new district.

The Toranomon-Azabudai Project will incorporate cutting-edge seismic designs and technologies, with dedicated power stations supplying electricity to the whole neighbourhood, according to Mori Building. It is designed to provide a safe city that will allow people to carry on living and working even in the event of a major disaster on the scale of the Great East Japan Earthquake.

A highlight of the project is the large 6,000 sq m Central Square. A significant proportion of this site, including areas on top of podium buildings, will be covered with greenery to take advantage of the stepped architecture. There will be more than 2 ha of green space creating a seamless urban oasis filled with trees, flowers and waterscapes.

The electricity supplied to the entire neighbourhood will be from renewable



LEFT: A view of the Toranomon-Azabudai Project at night.

BELOW LEFT: The east entrance.

BOTTOM LEFT: The office lobby.

BELOW: The hotel restaurant facing the Central Square.



sources, said Mori Building, which will meet the targets stipulated in the RE100 international environmental initiative led by the UK's Climate Group. The developer would apply for project certification under the WELL Building Standard of the International WELL Building Institute.



All images © Mori Building

The public realm and lower level architecture were designed by Heatherwick Studio from the UK, led by Thomas Heatherwick, the designer and creator of the London 2012 Olympic Cauldron. The three skyscrapers were designed by Pelli Clarke Pelli Architects from the US under the direction of the late César Pelli and Fred Clarke. The retail space was designed by Sou Fujimoto Architects of Japan, led by Sou Fujimoto.

The Toranomon-Azabudai Project is situated adjacent to Mori Building's ARK Hills complex at the midpoint between Roppongi Hills and Toranomon Hills. ■

## Pöyry plays role in Southeast Asia's power plant projects

Pöyry has recently been awarded the owner's engineer contract for a 30 MWac solar photovoltaic (PV) power plant project in Malaysia by Redsol Sdn Bhd, a subsidiary of Scatec Solar, a leading integrated independent solar power producer headquartered in Norway.

The solar PV plant, located in the state of Perak, will be the fourth project of its kind owned by Scater Solar in Malaysia. Pöyry's services will include assistance in project management, engineering review, as-built drawing review, and other assistance during project construction.

In Thailand, Pöyry has also completed work on the last of the 12 gas-fired combined cycle power plants owned by Gulf MP Company Ltd. The facility reached its commercial operation date (COD) as scheduled, on 1 July 2019.

Pöyry was awarded the engineering contract for the 12 projects in March 2015, which included nine 120-MW and three 130-MW gas fired combined cycle power plants. As the contractor's

engineer, Pöyry handled the engineering and design works, process and plant engineering, plant layout design, civil and structural design, mechanical and piping design, control and instrumentation design, electrical design, procurement and tendering services, as well as the project management and administrative services for all the aforementioned scope.

Gulf MP reportedly began selling electricity from these projects to the Electricity Generating Authority of Thailand (EGAT) in May 2017, when the first of the 12 plants reached its COD. The 12SPP power project has a combined installed power generation capacity of 1,490 MW and a combined installed steam generation capacity of 247 t/hr.

Gulf MP is jointly owned by Mitsui & Co Ltd and Gulf Energy Development Public Company Limited. Toyo Engineering Corporation and TEC Project Services Corporation were awarded the EPC and supply contracts respectively, in November 2014. ■

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# Beijing Daxing International Airport opens

The new Beijing Daxing International Airport is now open to the public, currently serving up to 45 million passengers per year. Located in the Daxing district, about 46 km south of the city centre, the airport is expected to accommodate up to 72 million passengers per year by 2025 and is planned for further expansion to serve up to 100 million passengers and 4 million tonnes of cargo annually.

The 700,000 sq m passenger terminal includes an 80,000 sq m ground transportation centre offering direct connections to Beijing, the national high-speed rail network and local train services, providing a catalyst for economic development in Tianjin and Hebei Province.

The terminal was designed by a Joint Design Team (JDT) under the leadership of Beijing New Airport Headquarters (BNAH), bringing together ADP Ingénierie (ADPI) and Zaha Hadid Architects (ZHA) to collaborate on the optimised design, subsequently working with BIAD (Beijing Institute of Architecture and Design) and CACC (China Airport Construction Company) to deliver the project.

ZHA functioned as the terminal design architect, providing a unified architectural language across the terminal, from the exterior forms of the building to the seamless architecture of the interior and the distributed pod planning arrangement for the retail design. ADPI acted as the terminal planning architect for the project, leading the development of the terminal's functional and technical specifications.

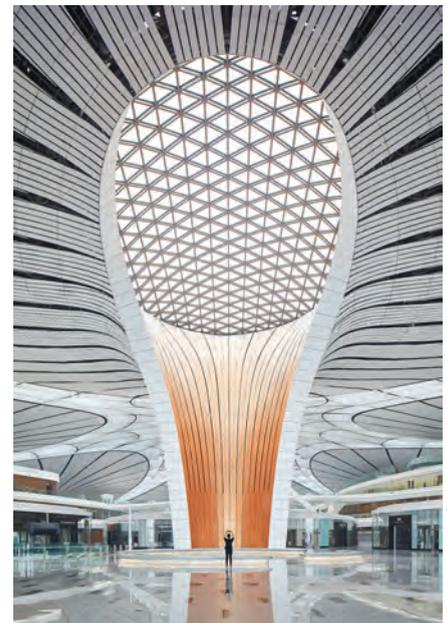
Following the completion of the JDT design scheme, the project was delivered by BIAD and CACC, which were responsible for the detailed design and delivery of the terminal building's architecture; and the technical design and implementation of the terminal's aviation functionality as well as the apron, runways and air traffic systems.

According to ZHA, photovoltaic power



LEFT: Zaha Hadid Architects was chosen as terminal design architect for Beijing's new iconic airport.

BELOW AND BELOW LEFT: Structural spans of up to 100 m create the terminal's generous public spaces and allow the highest degree of flexibility for any future reconfiguration.



All images © Hutton+Crow

generation is installed throughout the airport to provide a minimum capacity of at least 10 MW. The centralised heating with waste heat recovery is supported by a composite ground-source heat pump system incorporating a concentrated energy supply area of nearly 2.5 million sq m.

The airport also implements rainwater collection and a water management system that employs the natural storage, natural permeation and natural purification of up to 2.8 million cu m of water in new wetlands, lakes and streams to prevent flooding and

counter the summer 'heat island' effect on the local microclimate.

In addition, the terminal features a compact radial design, allowing a maximum number of aircraft to be parked directly at the terminal with minimum distances from the centre of the building, explained ZHA. This leads to high convenience for passengers and flexibility in operations. A total of 79 gates with airbridges connect directly to the terminal, which can rapidly process the passengers of six full A380 aircraft simultaneously. ■

## Tiong Seng secures contract to build hotel in Singapore

Tiong Seng Holdings Limited has won a S\$130.5 million contract from Midtown Development Pte Ltd, part of Worldwide Hotels Group, to build a hotel at Club Street in Singapore. The project will involve the construction of a 20-storey hotel building with shops and restaurants on the ground level and 19 storeys of hotel accommodation. Furthermore, it will include a basement

level carpark and an underground pedestrian link with both retail and restaurant outlet space. According to Tiong Seng, the project would employ a full concrete PPVC method, whereby volumetric concrete modules are produced off-site at the company's production facility before being transported on-site for assembly. ■



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## Aurecon completes 'largest solar farm project in SEA'

Aurecon has completed the Dau Tieng 1 and 2 solar power projects in Vietnam. The company served as the owner's engineer, in addition to providing project management, design review and site supervision services. The 420 MW facility is said to be the largest solar power plant in Southeast Asia.

The biggest challenge facing the project was the June 2019 deadline, said Aurecon. To fulfill Vietnam's renewable energy initiatives, the solar farm was scheduled to be commissioned and connected to Vietnam's power grid in under a year. Exacerbating the need for speed, the facility was also built next to a reservoir that would flood from October to February every year during monsoon season, pausing construction.

Collaboration between the project's partners and flexibility was thus critical to meeting the project's deadline. Aurecon said the owner and contractors were invited to design meetings for critical items, where contributions were encouraged. Working closely with all parties, Aurecon also conducted independent calculation checks to supplement the contractors' designs, speeding up approvals and achieving the project's outcomes.

Furthermore, to manage the site supervision of such a large-scale project, Aurecon collaborated closely with the client onsite inspections. Adopting a flexible approach, Aurecon joined the owner's engineering team to ensure safety and efficiency was closely observed across the 500-ha site.

Working with a diverse team of multinational partners on the project, clear communication between Aurecon and senior stakeholders was also important as these partners had different engineering practices. For instance, the engineering, procurement and construction (EPC) contractor was Chinese, while the substation's contractor was Vietnamese; this affected simple things like documentation and formats of basic design specifications. Through careful relationship building and utilising Aurecon's team in Vietnam to review local standards, Aurecon was able to streamline project outcomes and efficiently meet stakeholders' expectations.



ABOVE AND LEFT: Aurecon has helped to build the Dau Tieng 1 and 2 solar power projects in Vietnam.

"To accelerate the project's delivery, we also tapped on our international teams," added Worakarn Aimdee, Aurecon's technical director for infrastructure services, "Our South African unit contributed their considerable experience in engineering large-scale renewable projects, while our Bangkok team had good experience collaborating with B. Grimm Power on previous solar projects in Thailand."

According to Aurecon, the Dau Tieng 1 and 2 solar power plant was completed in less than a year. The facility will help meet the electricity demands of two nearby cities. It comprises over 1.3 million PV modules, 170,000 pile foundations and 600 km of steel mounting structures. ■

### Aurecon appoints new leader for Indonesia and Asia



Aurecon has appointed Varman Ramachandran (left) as its country director for Indonesia and client director of Energy, Resources and Manufacturing for Asia, effective from 7 August 2019.

"Varman is a proven leader with more than 20 years of experience in power projects and operational management in a consulting role across Australia and Asia. He successfully secured and oversaw several large power projects in the Asia region. He also has significant experience leading high-performing teams in Indonesia to advise a wide variety of large power consortiums and plant operators. His appointment will ensure we help clients unlock benefits in the energy sector for sustainable development in Asia," said Stephane Asselin, MD for Asia at Aurecon.

This latest appointment from Aurecon comes as the company continues to strengthen its business around

sustainability, digital transformation and infrastructure in Asia. Aurecon is highly optimistic about the Asian market, which is projected to grow 5.4% in 2019 and is at the forefront of digitalisation, according to the International Monetary Fund.

Based in Jakarta, Mr Ramachandran will focus on growing Aurecon's business within Indonesia and across the Asia region. The Indonesian 2019-2028 Electricity Supply Plan calls for the renewables target to be raised from 14.9 GW to 16.7 GW, with a commitment from the Indonesian government to reduce greenhouse gas emissions by 29% by 2030 through developing hydropower and other renewables.

With that in mind, Mr Ramachandran will be exploring ways Aurecon can help Indonesia transition to a more sustainable future. He will also help create strategies for the future of energy, resources and manufacturing in Asia through designing technology and innovative solutions integral to meeting tomorrow's challenges. ■

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# Civil contracts for Singapore's JRL project awarded

Singapore's Land Transport Authority (LTA) has awarded two civil contracts for the construction works of five Jurong Region Line (JRL) stations and their associated viaducts. These works are expected to start in 2020 and slated for completion in 2026.

One of the contracts, totalling S\$465.2 million, is for Shanghai Tunnel Engineering Co (Singapore) Pte Ltd. It comprises works to design and construct Choa Chu Kang, Choa Chu Kang West and Tengah stations with a 4.3-km viaduct between Choa Chu Kang and Tengah along Choa Chu Ave 3. This includes addition and alteration works to the existing Choa Chu Kang station on the North-South Line, to integrate it with the new JRL station.

LTA said that Shanghai Tunnel Engineering has an established track record of railway infrastructure projects for the Circle Line, Downtown Line and Tuas West Extension. The company is also involved in the ongoing construction of the Thomson-East Coast Line (TEL) Shenton Way, Katong Park and Bayshore stations and tunnels, as well as a stretch of tunnel from Woodlands Avenue 12 to the TEL Mandai Depot.

The other contract, totalling S\$274.3 million, is for Eng Lee Engineering Pte Ltd - Wai Fong Construction Pte Ltd Joint Venture (JV). It comprises works to design and construct Hong Kah and Corporation stations with a 3.4-km viaduct between them.

The JV is currently working on the ongoing construction of the TEL Mount Pleasant station and tunnels. Wai Fong Construction is also involved in the ongoing construction of the North-South Corridor between Victoria Street and Kampong Java Road, as well as the TEL Tanjong Rhu station and tunnels.

The JRL is Singapore's seventh MRT line, and is scheduled to open in three stages starting from 2026. According to LTA, it will



Artist's impressions of the new Choa Chu Kang Station (above) and Hong Kah Station.



Both images © LTA

be an elevated line serving both existing and future developments in the western part of Singapore.

The JRL will be approximately 24 km long and have 24 stations, including three interchange stations at Boon Lay, Choa Chu Kang and Jurong East MRT stations. This provides direct connectivity between the northwestern and western regions of Singapore.

In the initial years, the JRL is expected to serve 200,000 daily commuters. This is forecast to increase to more than 500,000 daily commuters in the longer term, once future developments in the area are realised. ■

## First Liebherr mobile construction crane in New Zealand arrives

New Zealand-based company Hi Lift Cranes has acquired an MK 88 Plus mobile construction crane from Liebherr, making it the first ever Liebherr mobile construction crane in the country. The handover of the unit took place in late July 2019 during a special event at the Ellerslie Event Centre in Auckland.

The compact Liebherr MK 88 Plus mobile construction crane features an 8-t maximum load capacity and can reach up to 45 m. "We have a clear vision of how the MK can change the market," said Barrie Mabbott, general manager of Hi Lift Cranes. According to him, the machine is ideal for many tight construction sites in central Auckland. "As it requires very little space, both in terms of assembly and footprint, road closures can often be avoided. Also, the MK can be placed directly at the building in question, thanks to its tower crane structure."

In addition to cost savings, Mr Mabbott is looking forward to shorter and more flexible operating times as the MK is fast and quiet when in use, owing to its electric drive, which is particularly suitable for night applications. Two of his crane operators have reportedly been trained to operate the machine. They are also said to be impressed with the one-man concept as well as the lift cab, which enables the crane operator to always have the load in view.

Hi Lift Cranes was founded in 1982 and is believed to be the oldest crane company in New Zealand. The 30-strong, family-



FROM LEFT: Bill Houlker of Liebherr, Tom Curran of Hi Lift, Thomas Schröder of Liebherr, Aleksandra Meissner of Liebherr, and Barrie Mabbott of Hi Lift.

owned business has achieved positive results with its five Liebherr mobile cranes and now wants to improve further with the help of the Liebherr MK 88 Plus mobile construction crane. ■



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## Westlake 66 mixed-use development breaks ground

Hang Lung Properties has started work on the Westlake 66 project in Hangzhou, the capital of Zhejiang Province, China. Located in the Xiacheng District, the development has a site area of approximately 44,800 sq m and a gross floor area of around 194,100 sq m. It will feature a high-end commercial complex comprising a world-class shopping mall (with a rooftop garden), five Grade A office towers and a luxury hotel.

“As one of the new first-tier cities, Hangzhou is one of China’s wealthiest cities with rapid economic growth. Being a leading technology and commercial hub as well as an important tourism centre, the city has a big demand for high-end commercial developments,” said Ronnie C. Chan, chairman of Hang Lung Properties. “With Hangzhou’s vibrant economy and consumer market, plus Hang Lung’s rich business experience in nearby Shanghai and other Mainland cities, we are confident that Westlake 66 will become a top commercial complex and landmark in eastern China.”

Hang Lung acquired the site in May 2018. Investment for the



The Westlake 66 in Hangzhou will feature a high-end commercial complex.

project is estimated to reach approximately RMB 19 billion. It is planned for completion in phases from 2024. ■

## Gomaco appoints new distributor in Thailand

Gomaco has appointed Bescon (Thailand) Co Ltd as its authorised distributor for Thailand. Based in Pathum Thani, Bescon will now provide sales and services for Gomaco’s full line of concrete construction products.

Gomaco machines are designed to slipform concrete streets and highways, airport runways, curb and gutter, sidewalks and recreational trails, safety barrier, bridge parapet and irrigation canals. Support equipment includes grade trimmers, concrete placers, concrete placer/spreaders, and texturing and curing machines. The company also offers equipment to finish flat slabs, bridges and slopes.

“Bescon (Thailand) has a company philosophy of delivering the best quality products and services at competitive pricing,” said Kent Godbersen, Gomaco’s vice president of worldwide sales and marketing. “Gomaco shares that customer-first idea and we are confident they will provide excellent sales and service to our customers in Thailand. We welcome Bescon (Thailand) to our worldwide distributor network.” ■



FROM LEFT: Julian Dann, Gomaco’s director of corporate development; Wattanachai Boonsong, Bescon’s product specialist; Karn Jirakietvadhana, Bescon’s general and sales manager; and Worakrit Rotrattanakon, Bescon’s product specialist.

## ADB supports various projects in Mongolia

The Asian Development Bank (ADB) and the Government of Mongolia have signed loan agreements totalling US\$103 million for projects that will upgrade border crossing points, complete a district demonstration hospital, and scale up road rehabilitation efforts in the country.

The US\$27 million for the ongoing Regional Improvement of Border Services Project will further upgrade border crossing points in Bichigt, bordering China in the east; and Borshoo, bordering Russia in the west. The project will build on the development initiatives of the ongoing project, which is already upgrading facilities and equipment of the crossing points in Altanbulag and Sukhbaatar, located in the northern part of Mongolia.

The US\$60 million for the Regional Road Development and Maintenance Project will rehabilitate the 118-km Darkhan–Altanbulag and 58-km Khuiten Valley–Arvaikheer road sections, while improving the condition of the 204-km Ulaanbaatar–Darkhan road section. Road safety in the project areas will also be enhanced, which includes the construction of another overtaking lane as well as the installation of road markings, barriers and guideposts. The project will also conduct assessments for the proposed new road to the planned Chinggis Khaan Tourism complex.

The US\$16 million for the ongoing Fourth Health Sector Development Project will help the government complete the establishment of Songinokhairkhan district hospital. Construction of the hospital is expected to be completed in December this year. ■

# Surbana Jurong teams up with 10 industry partners

Surbana Jurong (SJ) recently signed 10 Memorandums of Understanding (MOUs) with industry partners to collaborate on initiatives that will help improve productivity and drive sustainable practices in the built environment industry, as well as to support overseas expansion of homegrown solutions.

For productivity improvements, SJ teams up with JTC Corporation, Glodon, VR Collab, Bentley Systems, 51VR, Novade, One To One Display and Signify. Together, these companies and SJ seek to expand the use of technology to catalyse productivity for the architecture, engineering and construction industry.

With Glodon, Surbana Jurong will expand the adoption of 5D BIM to support the effective quantification of construction materials. 5D BIM is a model-based cost estimation technology system, which allows better visibility of the quantities and associated costs at the building design stage. This will enable designers and architects to better understand how their designs will affect the costs of the whole project at the early stage, and also allows the estimator to explore new ways of providing cost-effective and efficient designs and performance.

Facilitating information mobility is crucial for the built environment, so that different parties involved in a construction or development project are aligned to a common set of requirements. To strengthen this area, VR Collab and SJ will co-develop a transparent, end-to-end automated solution that enables all stakeholders involved in the project lifecycle to view and update information in real time. Bentley Systems will also work with SJ to develop onsite construction solutions, which can be embedded into current processes to boost productivity.

Other technological solutions to be initiated by the MOUs focus more on project applications, such as planning of smart cities using virtual reality (51VR), audit compliance (Novade), floor plan projection (One To One Display) and connected LED lighting for data access and insights (Signify).

For sustainable built practices, SJ and Republic Polytechnic will undertake efforts to facilitate knowledge sharing and conduct joint research pertaining to sustainability and resiliency, aquaculture and agriculture. Environment-friendly new materials, as



ABOVE: Surbana Jurong has signed MOUs with industry partners for collaborations in the built environment industry, and to support overseas expansion of homegrown solutions.

BELOW AND BOTTOM: Among the MOUs signed were agreements with Glodon (below) and JTC.



well energy and resource efficient solutions will be areas that SJ is looking into with JTC.

In support of the implementation of the Construction Industry Transformation Map, SJ will be collaborating with Shui On Joint Venture in Hong Kong to facilitate the expansion of prefabricated prefinished volumetric construction (PPVC) products and services into overseas markets. The two companies will also conduct research and development into innovative solutions in PPVC.

## Surbana Jurong and JTC

The MOU between SJ and JTC Corporation will see the companies collaborate and share research and development resources in the fields of digitalisation, productivity and automation, sustainability and resilience. The MOU aims to combine JTC's project management and engineering capabilities

with SJ's urban and infrastructure consulting expertise to develop practical and scalable solutions.

Subsequently, these solutions will be test-bedded or piloted by both companies at their respective estates, buildings, or projects. The solutions can potentially be trialled or rolled out by other collaborators in the built environment sector including international partners.

A key focus area of the MOU is the implementation of digital technologies to enhance productivity and automation across the built environment value-chain. SJ and JTC will look at building capabilities in Integrated Digital Delivery (IDD) – the use of digital technologies to integrate information and processes among the various stakeholders of the project, from designers, builders to facilities managers.

To digitalise information gathering, software applications and drones with Artificial Intelligence (AI) capabilities can be utilised. A challenge is handling and analysing a large amount of information for progress monitoring, resource management, quality and safety. Thus, one of the desired outcomes of the collaboration is to co-develop digital solutions that will automate data collection and analytics in these areas for building, infrastructure and reclamation projects. This will reduce the time spent by engineers for on-site manual monitoring while empowering project managers to make more informed decisions. They can further increase their productivity and reduce the margin of error by adopting other technologies such as computer-aided machines, robotics and new prefabrication solutions. JTC and SJ will also explore new advancements in Building Information Modelling (BIM) and Internet-of-Things (IoT) to improve project delivery in the aspects of resource, time, quality and cost.

In addition, JTC and SJ will jointly explore new alternative materials for building, infrastructure and reclamation. The aim is to reduce consumption of conventional construction materials in order to address potential shortages and build resilience into the supply chain. The companies will also look into technologies that can improve energy and resource efficiency to achieve lower carbon footprint, improve long-term durability and reduce the life-cycle costs in buildings and infrastructure. ■



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## Ken McDougall named president of Skyjack

Ken McDougall has been appointed as president of Skyjack, replacing Brad Boehler who has accepted a position with Skyjack's parent company Linamar.

According to Skyjack, Mr Boehler played an integral role in setting the company up for the success and growth that it has experienced over the past few years.

Mr McDougall previously served as Skyjack president and thus he comes with in-depth knowledge of the company's corporate values and its customers, as well as the industry. This makes him the ideal candidate to head Skyjack.

Moving forward, Skyjack plans to introduce new products within the next few years, and Mr McDougall is excited to bolster these product launches and continue to work with the Skyjack team to develop innovative, yet simple and reliable solutions for rental companies worldwide. ■



ABOVE: Ken McDougall.  
LEFT: Brad Boehler.

## Actuant to change name to Enerpac Tool Group



Actuant Corporation, a global industrial manufacturer of high force industrial tools and related services and highly engineered position and motion controls systems, has announced the adoption of a new business name, Enerpac Tool Group. This new name signifies the company's continued progression towards becoming a premier pure play industrial tools and services company, following the anticipated divestiture of the principal businesses of its Engineered Components and Systems (EC&S) segment in the fourth quarter of 2019.

"We look forward to our bright future as Enerpac Tool Group. Changing our name is an exciting and significant step in our evolution towards becoming a world-class, pure-play industrial

tools and services company with the Enerpac brand at its core," said Randy Baker, Enerpac Tool Group's president and chief executive officer. "We have a clear strategy to create shareholder value, driving growth and delivering best-in-class returns by leveraging our premium Enerpac brand, broad global reach and strong financial position. We will continue to be disciplined in our capital allocation while maintaining a conservative balance sheet, focusing on our organic growth initiatives and targeted M&A, balanced with capital returns to shareholders."

Along with the new business name, Enerpac Tool Group is also launching its new corporate website ([www.enerpactoolgroup.com](http://www.enerpactoolgroup.com)). The company anticipates changing its legal corporate name - subject to the approval of its shareholders - following its next annual shareholders meeting to be held in January 2020. ■

## Rolls-Royce Power Systems to restructure its brands

Rolls-Royce Power Systems, with its core brand MTU, is set to undergo a rebranding effort to present itself more clearly as an integral part of the British Rolls-Royce engineering group. The company said a new brand is expected to be implemented soon this year, along with the launch of a new MTU website.

The new brand structure aims to support the PS 2030 strategy of the Power Systems business unit and the global growth path. Rolls-Royce will be the corporate brand and the employer brand. Consequently, the companies within the business unit that include MTU in their names will be given a new designation.

MTU, as the brand name that customers are familiar with, will continue to be used to identify the company's products and solutions. The current MTU Onsite Energy brand for decentralised power supply systems will be integrated into MTU.

One of the first steps to be taken will be the renaming of four operating companies, which manufacture products and

solutions: MTU Friedrichshafen GmbH will become Rolls-Royce Solutions GmbH. This will be followed by MTU America Inc, which in future will operate as Rolls-Royce Solutions America Inc. MTU Onsite Energy GmbH in Augsburg will become Rolls-Royce Solutions Augsburg GmbH and MTU Onsite Energy Systems GmbH in Ruhstorf will be renamed Rolls-Royce Solutions Ruhstorf GmbH. The remaining subsidiaries will be given new designations based on the above examples. The products of Bergen Engines will also be part of the new brand architecture.

"The new brand architecture will provide clarity and improve the recognition of our company and its products," said Andreas Schell, CEO of Rolls-Royce Power Systems. "Our new profile is a clear commitment to Rolls-Royce, as its second largest business unit. By the same token, Rolls-Royce is committed to our MTU brand, which is something we are proud of." ■



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## Liebherr opens new subsidiary in Hamburg

Liebherr-MCCtec Vertriebs- und Service GmbH has invested approximately €20 million in its new subsidiary in Germany, located at the Hamburg Port. This new sales and service centre, comprising an area of 44,000 sq m, was officially opened in early September 2019. Its strategic location benefits from a good and wide-ranging infrastructure, such as easy access to motorways and railways, a public transport network and direct water access via three quays.

The new subsidiary is responsible for supporting Liebherr mobile harbour, ship and offshore cranes, plus Liebherr construction machinery from the product areas of crawler cranes, deep foundation machines and duty cycle crawler cranes. Currently, it has approximately 100 employees.

The new facility also serves as a hub for rental and buy-back machines. Another important function is the overhauling of components as well as the execution of complex repairs on machines that in some cases can be transported by sea directly to Hamburg.

“We are investing in a location which offers long-term potential for growth in several directions. Due to the logistic requirements, the harbour in Hamburg is our central hub for rental and buy-back machines, as well as for all kinds of repairs for the European area,” explained Jörg Schmidt, managing director of Liebherr-MCCtec Vertriebs- und Service GmbH.

“As the Hamburg Port Authority, we are extremely proud when we see today what an attractive location the company Liebherr has constructed in the heart of our Hamburg Port within such a short period of time,” said Jens Meier, CEO of Hamburg Port Authority.

A workshop area (2,160 sq m), a store (1,080 sq m), open storage (10,000 sq m) and a four-storey office building (3,750 sq m) have been erected on the new site. According to Liebherr, most of the construction work was completed within one year.

During the official handover and opening ceremony, a multitude of solutions from the product and service programmes were presented. In addition to the classic services such as repair, overhaul and logistics, stock and parts supply, this included



ABOVE: An aerial view of Liebherr's new subsidiary in Hamburg with its administration building (foreground) and workshop area (background).



LEFT: The official opening ceremony of the new subsidiary.

numerous digital solutions: real-time simulators for training purposes, online services, fleet management, augmented and virtual reality, and more.

“I am proud that such a traditional and yet future-oriented company as Liebherr has chosen this location for long-term engagement. The establishment here also fits in with the senate's port strategy,” commented Michael Westhagemann, Minister for Economics, Transport and Innovation. ■

## Vinci Construction completes Atlantic Bridge in Panama

The newly completed Atlantic Bridge in Colón, Panama, is now open. Located 3 km from the Gatun and Agua Clara locks, this 4.6 km structure - including 3.1 km of 'exceptional' engineering structures - creates a new link between the North American and South American continents, and can be used whether the canal locks are in operation or not.

The construction of the bridge was carried out by Vinci Construction companies, comprising Vinci Construction Grands Projets for the construction of the bridge, Soletanche Bachy subsidiary Rodio Swissboring Panamá for the deep foundations, and Freyssinet for the installation of the stays.

According to Vinci, due to the adversity of the Panamanian tropical climate on the Atlantic side, a technical solution entirely made of reinforced concrete was chosen by the Panama Canal Authority rather than a metal structure. The central span (the bridge section that spans the canal), consisting of 530 m of concrete deck located 75 m above sea level, constitutes a world record for a cable-stayed bridge, while its two towers dominate



The Atlantic Bridge links the North American and South American continents.

the waters of the Atlantic Ocean at over 210 m high. In order for work to be performed without interrupting the transit of container ships, four innovative form travellers, each weighing 240 t, were used to build the central span. Vinci further highlighted that the work was carried out without any serious accidents. ■

# 'World's tallest residential building' tops out

The US-based developer Extell Development recently announced that Central Park Tower has topped out. At approximately 472 m high, it is believed to be the tallest residential building in the world.

"Central Park Tower is the pinnacle of development in New York and around the world," said Gary Barnett, founder and chairman of Extell Development. "We would not be able to offer this level of design, quality and service without the contributions from the world's most talented architects, engineers and designers."

Located on West 57 Street, along the corridor known as 'Billionaire's Row', the project was designed by Adrian Smith + Gordon Gill Architecture (AS+GG). The building's facade features combined elements of glass, satin-finished stainless steel, and light-catching vertical and horizontal details that accentuate the



© Extell Development

LEFT AND RIGHT: The Central Park Tower has recently topped out. At approximately 472 m high, it is set to be the tallest residential building in the world.

interplay of texture and light. At a height of 91 m from the street, the tower cantilevers to the east, creating Central Park views for all north-facing residences.

Extell is co-developing Central Park Tower with SMI USA, the US subsidiary of Shanghai Municipal Investment, the infrastructural investment company

responsible for the Shanghai Tower – which is believed to be the second tallest building in the world. Lendlease, one of the world's largest property, infrastructure, development and construction management firms, served as construction manager for Central Park Tower. ■



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Singapore's weak demographic outlook, with population growth set to fall below 1% pa over the next five years, will also act as a drag on construction over the long-run. However, investment in health and education buildings is expected to provide a bright spot for the sector, with government expenditure increasing in response to an ageing society and technological disruption.

As a small, open economy, the US-China trade war has hit Singapore particularly hard. The economic uncertainty has spilled over to the real estate sector, and immediate growth prospects now are mixed. Beyond this, the sector is expected to rebound in the early 2020s, to recover from the recent downturn (activity declined 10% y/y over 2014-2018). But the recovery will be modest when compared to historical performance, with weak demographic trends and muted house price growth weighing on activity. Overall, residential building work done is projected to grow by 14% y/y over 2019-2023.

### Infrastructure programmes 'to weather the storm'

Governments across the region can use infrastructure spending to offset a slowdown in private sector activity; big construction projects tend to have large lead times and, once funds are committed, are expensive and difficult to stop. To this end, the nation-building infrastructure programmes already being rolled out in several countries in the region will be able to weather the storm and are expected to be key parts of expansionary fiscal policy designed to combat the downturn in global growth momentum.

Overall, our civil engineering construction forecasts are brightest for countries that have committed funding for much-

needed infrastructure projects and have continued to streamline regulatory processes. Indonesia, Vietnam and the Philippines top the list of countries in the region for infrastructure spending targets to 2024, while opportunities remain for countries like Malaysia.

In Indonesia and the Philippines, there has been a significant emphasis on transport projects improving linkages between regions and economic zones such as the US\$3.4 billion Simpang Indralaya-Muara and Enim-Lubuk Linggau toll road and the US\$730 million Metro Manila Skyway, while Vietnam is undertaking large energy investments in projects such as the US\$3.7 billion LNG Import Terminal, along with expansions to its transport network including the US\$3.5 billion Can Tho City Rail line.

These projects will contribute to a rapid increase in civil engineering construction over the forecast period, with average annual growth of 22% y/y for Indonesia, 20% y/y for the Philippines and 14% y/y for Vietnam projected over 2019-2023. Malaysia faces a more uncertain investment environment, but the government has indicated its commitment to re-start several large infrastructure projects such as the US\$33.53 billion Bandar Malaysia infrastructure project. ■

BIS Oxford Economics is part of the Oxford Economics Group, one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 7,000 cities and regions.

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

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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
11 to 13 Mar 2020	BuildTech Asia 2020 Singapore Expo Singapore	Sphere Exhibits Tel: +65 6319 4035 Email: buildtechasia@sph.com.sg Website: www.buildtechasia.com
18 to 22 Mar 2020	Worldbex 2020 World Trade Centre Metro Manila Manila The Philippines	Worldbex Services International Tel: +632 656 9239, Fax: +632 477 1899 Email: inquire@worldbexevents.com Website: www.worldbex.com
19 to 22 Mar 2020	Megabuild 2020 Jakarta Convention Centre Jakarta Indonesia	PT. Reed Panorama Exhibitions Tel: +62 2556 5000 Email: megabuild@reedpanorama.com Website: www.megabuild.co.id
23 to 25 Jun 2020	Futurebuild Southeast Asia 2020 Malaysia International Trade and Exhibition Centre Kuala Lumpur Malaysia	United Business Media (M) Sdn Bhd Tel: +603 9771 2688, Fax: +603 9771 2799 Email: ecobuild-sea@ubm.com Website: www.ecobuildsea.com
9 to 11 Sept 2020	Intermat ASEAN & Concrete Asia 2020 Impact Exhibition & Convention Centre Bangkok Thailand	Comexposium & Impact Exhibition Management Tel: +662 833 5315 Email: info@asean.intermatconstruction.com Website: asean.intermatconstruction.com
3 to 6 Nov 2020	bauma Conexpo India 2020 Huda Ground Gurgaon, New Delhi India	Messe München Tel: +49 89 949 20251, Fax: +49 89 949 20259 Email: info@bcindia.com Website: www.bcindia.com
24 to 27 Nov 2020	bauma China 2020 Shanghai New International Expo Centre Shanghai China	Messe München Tel: +49 89 949 20251, Fax: +49 89 949 20259 Email: info@bauma-china.com Website: www.bauma-china.com
Date	Events outside Asia	Organiser & Contact
4 to 7 Feb 2020	World of Concrete 2020 Las Vegas Convention Centre Las Vegas, Nevada USA	Informa Exhibitions Tel: +1 972 536 6368 Email: contactus@worldofconcrete.com Website: www.worldofconcrete.com
10 to 14 Mar 2020	Conexpo-Con/Agg 2020 Las Vegas Convention Centre Las Vegas, Nevada USA	Association of Equipment Manufacturers Tel: +1 414 274 0644 Website: www.conexpoconagg.com ( <i>email enquiries should be made online.</i> )
26 to 29 May 2020	Bauma CTT Russia 2020 Crocus Expo International Exhibition Centre Moscow Russia	Messe München Tel: +49 89 949 20251 Email: info@bauma-ctt.com Website: www.bauma-ctt.ru/en
17 to 18 Jun 2020	Smart.Con São Paulo Expo Centre São Paulo Brazil	Messe München Tel: +55 11 3868 6340 Email: info@intechtra.com.br Website: www.exposmartcon.com.br

**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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## Futuristic technologies at ASEAN Super 8 2020

The ASEAN Super 8 will return to Kuala Lumpur, Malaysia, from 23 to 25 June 2020, to be held once again at the Malaysia International Trade and Exhibition Centre (MITEC) in conjunction with the International Construction Week (ICW) – hosted by the Construction Industry Development Board (CIDB). The event will feature Futurebuild Southeast Asia (SEA) expo, focusing on construction-related futuristic technologies and innovations, where participants could get the first-hand experience and insights on advanced and upcoming technologies in the built environment.

The ASEAN Super 8 will bring together several built environment exhibitions namely ASEAN M&E, REVAC Expo, Tenaga Expo, ASEAN Lift, ASEAN Solar, ASEAN Light, Futurebuild SEA, Heavy Mach and IFSEC Southeast Asia. The Futurebuild SEA Expo will be the centrepiece of the event, showcasing how technology such as robotics, Internet of Things (IoT) and artificial intelligence (AI) can be used in the construction sector, and how costs and labour dependency can be reduced with modern technology – without compromising on quality.

According to Report Linker, with a CAGR growth of 4.2% from 2018 to 2023, the global construction industry is forecast to reach US\$10 trillion by 2023, and new built environment-related technologies will be a key catalyst for this growth. The Futurebuild SEA expo will focus on such technologies that could benefit all exhibitors and visitors.

“Following the strong support from the exhibitors and visitors in 2019, which exceeded expectations amid challenges in the

business environment, we anticipate to see the participation of 20,000 visitors and 500 exhibitors from various countries in the 2020 ASEAN Super 8 event,” said Gen. Tan Sri Dato Seri Panglima Mohd Azumi Bin Mohamed (Rtd), co-chairman of UBM Informa Markets, the organiser of ASEAN Super 8.

“The year 2019 has been a milestone year for UBM Informa Markets and ASEAN Super 8 was key in promoting continuous development for us. With events like ASEAN Super 8, Malaysia also stands to gain immense economic benefits as deals are secured, purchases are made and business partnerships are formed.

“This is the best platform where industry players will be able to generate sales lead across the entire value chain, while visitors will enjoy a hassle-free accessibility to nine different trade exhibitions that offer unique experience across the entire spectrum of construction.”

This year’s ASEAN Super 8, which was held between 19 and 21 March, drew 16,781 trade visitors from 61 countries. A total of 339 companies from Malaysia and other countries such as the US, the UK, Australia, India and Japan have participated in the event. In addition, approximately 2,000 delegates attended the conferences and seminars during the event.

The ASEAN Super 8 exhibition is supported by Ministry of Works, hosted by CIDB and endorsed by Malaysia External Trade Development Corporation (MATRADE) along with several other stakeholders from the industry. ■

Website: [www.super8asean.com](http://www.super8asean.com)



ABOVE: The launch of ASEAN Super 8 2020.

BELOW, RIGHT AND BELOW RIGHT: This year’s ASEAN Super 8 was held from 19 to 21 March, attracting 16,781 trade visitors from 61 countries.



# Conexpo-Con/Agg 2020 to showcase 'smart city'

A 10 by 22-ft (about 3 by 6.7 m) smart city replica has recently been unveiled by the planning team for Conexpo-Con/Agg 2020, which demonstrated how a smart city, through sensors and analytics will be able to transform information into digestible data, providing knowledge for the city to work smarter.

The replica will be showcased at the Conexpo-Con/Agg 2020 in Las Vegas, taking place from 10 to 14 March 2020 and will feature several scenarios at the Tech Experience such as different city grids and how a city responds to heat, wind and storms; connectivity in the city, including 5G, sensors, telematics and IoT; and impacts of construction. The jobsite of the future within the city and how equipment will communicate will also be on display.

"We were beyond excited to reveal the 'smart city' today," said Al Cevero, senior vice president for construction, mining & utility at the Association of Equipment Manufacturers (AEM). "Our goal for the Tech Experience in 2020 is to show contractors how all of these exciting new technologies will impact their current work, how the expectations and demands of customers will change and how the current state of infrastructure may change."

Conexpo-Con/Agg is expanding the 2020 footprint to include the Las Vegas Festival Grounds - in addition to the Las Vegas Convention Centre - located on the Las Vegas Strip adjacent to the

Circus Circus Hotel. Types of exhibits in the Festival Grounds will include aerial and cranes, earthmoving, hauling and underground construction.

The 2020 show connected campus will also include new and expanded transportation, attendee experiences and registration locations. Features will include multi-site drop off locations for shuttles, complimentary monorail passes, golf cart shuttles, and various experiential transportation options to accommodate for the attendees throughout the week.

"AEM is committed to bringing people together at Conexpo-Con/Agg, as the show serves as a catalyst for industry growth and development," said Dana Wuesthoff, vice president of exhibitions and event services at AEM and Conexpo-Con/Agg show director. "We wanted to make sure everyone can explore the entire show and have the best possible experience."

In addition to the record-setting 2,800 exhibitors and the 2.6 mil sq ft (about 241,547.904 sq m) of exhibit space, 150 education sessions will be held. The education sessions feature the latest topics and industry trends and are grouped into tracks for ease in finding education that meets various needs such as aggregates, asphalt, concrete; cranes, rigging and aerial lifts; and earthmoving and site development, among others. ■

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



ABOVE: Returning in March 2020, Conexpo-Con/Agg is expanding its footprint to include the Las Vegas Festival Grounds, in addition to the Las Vegas Convention Centre.

BELOW: Tech Experience at the next Conexpo-Con/Agg 2020 will showcase a smart city replica.



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EQUIPMENT

# Intermat ASEAN and Concrete Asia close successfully

Intermat ASEAN and Concrete Asia 2019 – the Southeast Asian trade show for construction and infrastructure, and the International exhibition for the Asian concrete sector – were recently held from 5 to 7 September 2019 at the Impact Exhibition and Convention Centre, Bangkok, Thailand.

The two co-located events attracted over 5,760 industry professionals globally (from 31 countries), and featured more than 300 exhibiting brands from around the world such as Australia, Belgium, China, Finland, Germany, Hong Kong, Italy, Japan, Malaysia, Russia, South Korea, Singapore, Taiwan, Thailand, the United Kingdom and the United States. The level of international participation reflects the importance of Thailand as a key industry meeting point for the construction, infrastructure and concrete sectors in the Southeast Asia region.

“Intermat ASEAN has been improving every year. We are getting more quality visitors and potential customers. We will definitely come back again next year,” said Calvin Ang, executive director of Siam Industrial Corporation, who has exhibited at Intermat ASEAN since the first edition.

Loy Joon How, general manager of Impact Exhibition Management Co Ltd commented, “Intermat ASEAN and Concrete Asia were held in response to support the region’s growing demands. In this year’s edition, we are pleased to have organised over 460 business-matching meetings between exhibitors and invited buyers, generating about THB 200 million worth of on-site sales. The market outlook looks positive with the recent infrastructure development initiatives announced by the government. Hence I am not surprised that machineries and equipment were sold on-site during the exhibitions.”

The two events provided a platform for the Thai government to highlight its current and upcoming mega infrastructure projects worth over THB 27.7 billion, especially on transportation infrastructure in the Eastern Economic Corridor that includes road constructions, high-speed rail and other transportation and logistics infrastructure developments.

The Intermat ASEAN and Concrete Asia are also supported by several government agencies. Sorapong Paitoonpong, deputy director general at Department of Rail Transport, Ministry of Transport, presided over the opening ceremony and Prasak Bandhunnark, deputy director general at Department of Rural Roads, Ministry of Transport, joined the networking events with key exhibitors.

Among the conferences and seminars that took place, there was a panel discussion on ‘Innovations and Future of Rail Transportation’ jointly organised by the State Railway of Thailand, Ministry of Transport and King Mongkut’s University of Technology North Bangkok. Dr Siripong Preutthipan, deputy governor at State Railway of Thailand, was one of the panel speakers and he gave an overview of the future of rail transportation infrastructure developments in Thailand.



ALL IMAGES: The co-located Intermat ASEAN and Concrete Asia 2019 were recently held from 5 to 7 September in Bangkok, Thailand, drawing over 5,760 industry professionals from 31 countries.

The next edition of Intermat ASEAN and Concrete Asia is scheduled to return to Bangkok from 9 to 11 September 2020. ■  
Website: [asean.intermatconstruction.com](http://asean.intermatconstruction.com) / [www.concrete-asia.com](http://www.concrete-asia.com)

# Tunnelling professionals to meet in KL next year

The next World Tunnel Congress (WTC) will be held in Kuala Lumpur, Malaysia, from 15 to 21 May 2020. Taking place at the Kuala Lumpur Convention Centre (KLCC), it will incorporate lectures, technical sessions, various committee and working group meetings, site and technical visits, and brief excursions, among others.

The Institution of Engineers, Malaysia (IEM) is expected to welcome more than 2,000 participants to the event - which will be accompanied by an exhibition featuring more than 200 participating companies from all over the world.

"The preparations for the World Tunnel Congress and 46th ITA General Assembly 2020 in Kuala Lumpur are in full swing. Registration should be made as soon as possible, due to the early bird chance (before 1 December 2019) and the high demand," said Ir. Dr. Teik Aun Ooi, organising chairman of WTC2020.

The event will start with an ITACET training course, targeted at young tunnellers and those who are interested in tunnelling and underground space developments. Global tunnelling experts will be sharing their experiences. More than 15 technical presentations under the topic of 'Innovations in Tunnelling - Geotechnical Engineering and Project Management' will provide insights into five different main fields of tunnelling and underground space on Friday and Saturday (15 and 16 May). The first part of the General Assembly and some working group meetings will take place on Sunday (17 May), and the congress welcome reception will start in the evening.

The congress and the opening ceremony with both Muir Wood and keynote lectures are scheduled for Monday morning (18 May). The exhibition will also kick-off on the same morning. Technical sessions, presentations, committee meetings and networking with fellow participants, exhibitors and business partners will fulfil the days until the second part of the General Assembly on Wednesday afternoon, with the closing ceremony as the finale of the WTC2020 event and followed with the handover of the ITA flag to the next host country Denmark for WTC2021.



WTC2020 will take place at the Kuala Lumpur Convention Centre (KLCC), expected to welcome more than 2,000 participants to the event.

Several site and technical visits will also be organised during and after the congress, including SMART Tunnel (18 May), Tunnelling Training Academy (19 May) and Underground works at both KVMRT Line 2 and Line 3 (20 May). In addition, on Thursday (21 May) limited participants will have a chance to book a technical visit to either the ongoing East Coast Rail Link or the completed Pahang-Selangor Raw Water Transfer Tunnel. ■

Website: [www.wtc2020.my](http://www.wtc2020.my)



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# Singapore's first International Built Environment Week

The inaugural International Built Environment Week (IBEW) was attended by more than 12,000 overseas and local visitors. Themed 'Transforming the Way We Build', the event brought together the whole built environment value chain, showcasing progressive firms and the latest innovations in the industry, set against the backdrop of global trends like urbanisation, digitalisation and climate action. Organised by the Building and Construction Authority (BCA), IBEW was jointly presented with 12 Trade Association and Chambers (TACs) and participation from more than 20 Singapore firms and partner agencies.

"Since the Construction Industry Transformation Map (ITM) was launched two years ago, our built environment sector has seen good progress. Leading firms are staying ahead of the curve through deep capability building, strong collaborations and co-creating effective solutions for the built environment sector," said Hugh Lim, CEO of BCA. "The inaugural IBEW is a shared platform that reflects both the aspirations and the progress of the built environment sector in Singapore. Together with like-minded international partners, we envision IBEW to be the platform in the region for rich exchange of ideas and co-creating innovative solutions to transform the built environment."

IBEW 2019 offered BE Connect, a business platform that gathers urban solution providers from Singapore, developers from the region, and the investment community to address urban challenges in the region. Over the past nine months, BCA has met with close to 100 developers in China, India and Southeast Asia to understand their needs, introducing solutions and sharing relevant experience by Singapore's urban solution providers. BE Connect marked a major milestone in a year-round effort to assist buyers in the region to access fully integrated solutions across the entire built environment value chain.

IBEW 2019 featured four co-located trade shows: BEX Asia, focusing on sustainable solutions for buildings across all sectors;



BEX Asia was one of the trade shows taking place during IBEW 2019.

Mostra Convegno Expocomfort (MCE) Asia, designed for solutions that maximise building efficiency and energy operations; Innobuild (IB) Asia, presenting construction materials, tools and technologies to drive construction productivity and resource efficiency; and Smart Cities and Buildings (SCB) Asia, highlighting the convergence of technology and construction to create more liveable cities.

Together, the trade shows drew over 550 local and international exhibiting brands from more than 30 markets. More than 70 industry leaders also shared their insights on new technologies and trends at the tech talk seminar areas, covering three thematic topics at Digital Rally, Energy Xchange and Green View. The exhibitions welcomed over 70 delegation groups from seven markets to discuss and exchange ideas on the latest innovations that will shape the future of sustainable cities. ■

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

## Enhancing IDD and DfMA

To support the adoption of Integrated Digital Delivery (IDD) - one of the key transformation areas identified under Construction ITM - BCA and the Infocomm Media Development Authority (IMDA) had already launched a joint grant call for common digital platforms in November 2018. IMDA has awarded to Delphi Pte Ltd, a joint venture between Hubble Pte Ltd, and Aurum Investments Pte Ltd (a subsidiary of Woh Hup Holdings Pte Ltd), a grant to develop an interoperable and common platform that will digitally connect project parties, namely developers, designers, fabricators, builders, and building operators so that they can share digital assets through this AI-powered platform catered specifically for the construction sector.

Third-party service providers, like quantity surveyors, M&E consultants and DfM consultants, can offer their own digital products and services on the platform. The ability to more accurately estimate demand for materials and manpower, realise just-in-time efficiencies, ensure error-free transactions, and eventual reduction of re-work through the use of new digital and data services, are some of the benefits of such a digital platform.

To accelerate the adoption of DfMA (Design for Manufacture and Assembly) that improves the quality of local buildings,

minimises noise and dust from construction sites to the neighbours and the surrounding environment, as well as boosts site productivity, BCA will be introducing several enhancements to the Buildability Framework. Large residential non-landed projects with a Gross Floor Area (GFA) of 25,000 sq m and more will be required to meet a higher buildability requirement.

In order to place more focus on design instead of just regulatory compliance, there will also be outcome-based options that consultants may adopt for these large residential non-landed developments instead of following the usual code compliance method. BCA will also be exempting small projects with a GFA below 5,000 sq m from the need to comply with the buildability framework. More details will be announced at a later stage.

The outcome-based options will also be extended to other development types from 2020. In addition, there will be greater emphasis on DfMA in structural, architectural, and Mechanical, Electrical and Plumbing (MEP) works in the new 2020 Code of Practice (COP) on Buildability. BCA said it will invite firms to participate in a pilot to walk-through the proposed changes, so that key learning points can be included in the detailed 2020 COP. ■



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## MEWP manufacturers 'renew' harness pledge

Leading manufacturers have committed to a pledge to help ensure all operators of boom-type mobile elevating work platforms (MEWPs) use the correct full-body harness and correct lanyard. The pledge signing ceremony was hosted by the International Powered Access Federation (IPAF) on 5 September 2019 during the BICES exhibition in Beijing, China.

Among the MEWP manufacturers that signed the pledge - which renews and reinforces a mass pledge signed at the IPAF Asia Conference & Showcase 2017 in Changsha, China - were Sinoboom, DingLi, JLG, Terex Genie, Haulotte, Zoomlion, Sany, LGMG, JiangHe and Shandong Chufeng.

"Already we have the support of IPAF members in making the correct type of full-body harness and adjustable fall-restraint lanyard available to all operators of boom-type MEWPs in China and the wider region," said BaiRi, IPAF's China representative. "The pledge is a renewal of that commitment and to ensure that the operators are properly trained and understand the importance of wearing a harness and lanyard at all times and in the correct way.

"It is important all operators and occupants of boom-type platforms wear a harness and lanyard as per the guidance in IPAF's global H1: Fall protection in MEWPs technical guidance, which has been recently updated and is available in multiple languages, including English and simplified Chinese.

"This is important to prevent occupants falling from boom-type MEWPs, which according to IPAF's global accident reporting and analysis is still one of the leading causes of serious injuries and fatalities when using MEWPs.

"A harness and lanyard should be worn to protect against the catapult effect, where occupants are ejected from the platform while driving, loading or unloading the MEWP, where the MEWP is snagged on an object or structure, or when the MEWP is struck by another machine or road vehicle.



MEWP manufacturers signed a harness pledge at the BICES 2019 (above). This renews and reinforces the mass pledge previously signed at the IPAF Asia Conference 2017 (left).



"We must as an industry strive to reduce and eradicate these common causes of accidents when using MEWPs, and wearing the correct harness and fall-restraint lanyard in all boom-type platforms is key to this."

At BICES, IPAF also provided its safety campaign information including a demonstration of how to select and wear a harness, the dangers of the catapult effect, and how to work safely alongside roads and in public places with MEWPs, which is IPAF's global safety campaign for 2019. ■

## New event meets demand for MEWP safety training in Oman

More than 50 delegates recently attended a special workshop hosted in Oman by IPAF, giving an overview on global standards of training for operators, managers and inspectors of MEWP equipment.

The inaugural event was hosted by Jason Woods, IPAF's Middle East and India representative, at the Radisson Blu Hotel in Muscat and offered a thorough review of training and standards and how they should be applied in Oman.

There is reportedly burgeoning demand in Oman and the wider Middle East for expert knowledge on global safety standards and best practice, and professional training for MEWP operators and those supervising and managing MEWPs to work at height.

According to IPAF, demand for its Powered Access Licence (PAL) Card is rising across the Middle East since project



Jason Woods, IPAF's ME and India representative.

managers on the Expo 2020 construction project in UAE mandated all users of powered access on its site must hold a valid PAL Card. IPAF has also been working in neighbouring countries to support the inspection regime and to help train and support MEWP inspectors. In addition, IPAF's Middle East Regional Council has

been helping to advise local regulatory authorities on how to adopt MEWP safety standards and promoting IPAF as a valuable resource for its members.

One of the speakers, Osama Melhem from Abu Dhabi Quality Conformity Council (QCC), talked about regional governments' desire to drive standards up and improve safety and training levels among machinery operators across all industries. He also announced that IPAF would be assisting the QCC in delivering MEWP proficiency testing of inspectors in Oman on 22-23 September 2019.

Other representatives including Dr Ramesh Sivathanu, deputy regional coordinator of the Drops Oman chapter spoke about the risks associated with items dropped from height and the introduction of a new standard charter, the first of its kind in Oman. ■

# Norty Turner named IPAF president



FAR LEFT:  
**Norty Turner,**  
IPAF's new  
president.  
LEFT:  
**Andy Studdert,**  
IPAF's interim  
CEO.

Norty Turner has been appointed as president of IPAF, after Brad Boehler decided to step down having recently left his role with IPAF member firm Skyjack.

Mr Turner of United Rentals steps up from deputy president, while Karin Nars of Dinolift assumes the role of deputy president and Karel Huijser of JLG is named IPAF vice president.

"We'd like to thank Brad for all the work he's done and wish him well in his future career," said Andy Studdert, IPAF's interim CEO. "We're pleased to welcome Norty, Karin and Karel into their new roles; IPAF will continue to promote the safe and effective use of powered access worldwide under the leadership of its updated presidential team."

While Mr Boehler does hold a directorship with another IPAF member firm, Serious Labs, it is not a member with full voting rights, so under IPAF's operating rules he could no longer continue to serve on the board and as president of the federation.

"When Brad discovered he wouldn't be able to carry on as IPAF president, he put aside his personal disappointment in compliance with the technical requirements of the operating rules," said Mr Studdert, paying tribute to Mr Boehler and his achievements.

"Brad's ability to support the industry from a safety standpoint and to achieve record growth year on year with Skyjack stands him in great stead.

"He'll no doubt be a huge asset and driving force in whatever endeavour he turns to next. We hope he decides to continue deploying his talent and determination in powered access and continues to lead in making our industry even safer." ■

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Some models are not available depending on the area.

# Manitowoc introduces Potain MCT 325 flat-top crane

Manitowoc has launched the Potain MCT 325 to further expand its popular MCT range of topless cranes. The new model was recently unveiled during a special event at Manitowoc's factory in Zhangjiagang, China. At the event, the 16 t version of the MCT 325 was displayed with its full 75 m jib.

As with other cranes in the range, the new Potain MCT 325 is designed to deliver easier transport and assembly, plus high efficiency and reliability on construction projects. It offers an efficient solution for customers requiring strong and versatile cranes in the 12 t and 16 t class.

Available in two versions, the Potain MCT 325 provides jib length configurations from 40 to 75 m, in increments of 5 m. At its 75 m jib end, the MCT 325 can handle 2.5 t for the 12 t version and 2.3 t for the 16 t version, making it ideal for long-distance lifting. Manitowoc said that on a well-prepared site, the MCT 325 can be set up within 1.5 days, with the complete jib and counter-jib erected in four lifts.

The MCT 325 is designed to work with the 2 m x 2 m L68 and L69 mast systems and can be utilised with fixing angles in a regular high-rise construction; in an internal climbing configuration; or mounted on a chassis, giving users maximum versatility. There is also a new square design of the crane's counter-jib, the first in the Potain MCT range.

To ensure easier assembly on site, the complete jib and counter-jib can be erected in two lifts each, meaning a greater choice of assist cranes can be used for the task. And there are dedicated sling points on the counter-jib and transport brackets on the jib to facilitate easier loading into the crane's compact transport configuration.

Customers have many options for the hoisting, slewing and trolley mechanisms. There are a variety of hoist options, all with frequency-controlled technology. The 12 t version comes with the standard 75 LVFC 30 or the option to upgrade to the 75 HPL 30. The 16 t version comes with the standard 75 LVFC 40 or there is the option to upgrade to the 75 HPL 40 or 100 LVF 40.

The 75 LVFC 30, a 55 kW-rated hoist, offers a rope capacity of 766 m and can lift 1.5 t at up to 114 m/min. The 75 LVFC 40, a 55 kW-rated hoist, offers a rope capacity of 637 m and can lift 2 t at up to 90 m/min. The winches are available with a safety brake option.

In 2014, Manitowoc launched its first Potain topless cranes from the Zhangjiagang factory, the MCT 385. Over the years, the company has continued to innovate and added the MCT 205, MCT 85, MCT 565 and now the MCT 325 to complement the range.

Like all Potain cranes from the company's Asian range, Manitowoc is expecting strong interest in the new model. Deliveries of the Potain MCT 325 were scheduled to begin in September 2019 and the crane will be sold across Asia Pacific, the Middle East, Africa, Latin America and Russia and the CIS countries.



TOP: The new Potain MCT 325 tower crane offers 12 t and 16 t versions, with a maximum jib length of 75 m.

MIDDLE AND ABOVE: At its 75 m jib end, the crane can handle 2.5 t for the 12 t version and 2.3 t for the 16 t version, making it excellent for long-distance lifting.

According to Manitowoc, the new MCT 325 will ultimately replace the MC 310 model, the company's long-serving and popular hammerhead top-slewing crane. ■

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

# Wirtgen expands inset slipform paver line

The new Wirtgen inset slipform pavers - SP 124i/SP 124 and SP 124 Li/SP 124 L - deliver sufficient power for paving concrete pavements from 4.50 m to 12 m wide and up to 450 mm thick. Available for global markets, the machines are powered by either a 430-hp engine (Euro 5/US Tier 4f) or a 365-hp engine (Euro 3A/US Tier 3).

These inset slipform pavers allow for cost-effective paving of large-scale concrete pavements, such as highly durable highways or aircraft runways. Due to their modular design, the machines can be customised to meet nearly any customer's specific requirements.

The SP 124i/SP 124 is the first slipform paver from Wirtgen with a maximum working width of 12 m to be equipped with four steerable and slewing crawler units, which are optionally available with a new slew drive steering system and a steering angle of up to 260°. Thanks to its manoeuvrability, the machine can be quickly and flexibly adapted to the conditions on the jobsite. With this model, it is also possible to pave a surface that is directly adjacent to an existing building.

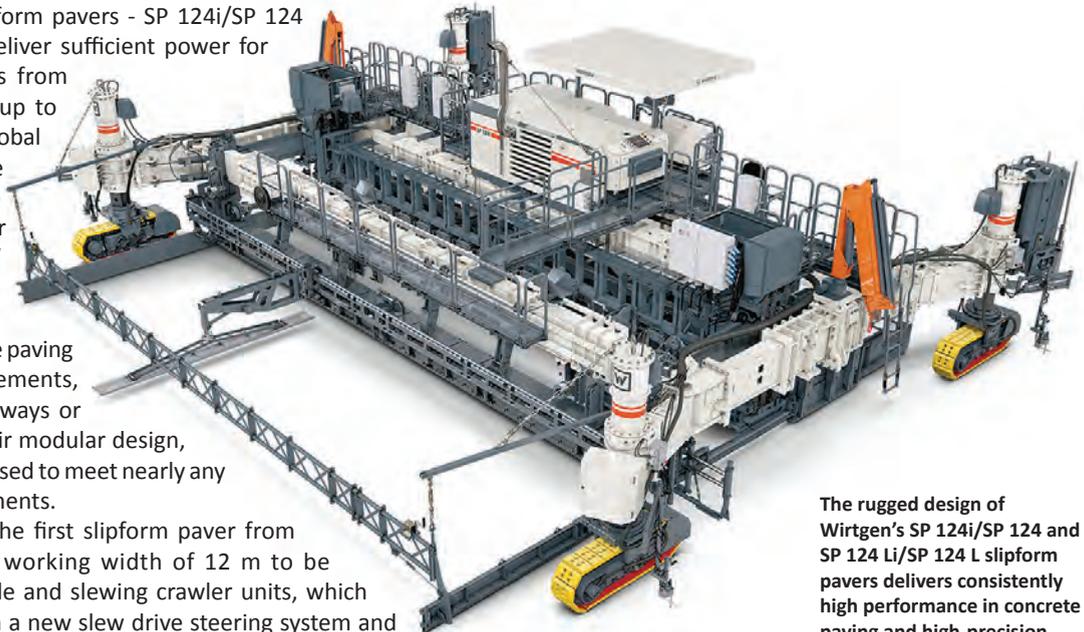
The four crawler units of the SP 124i/SP 124 can be switched to rotation mode at the push of a button. As a result, the paver can turn almost on the spot and directly produce the next lane in the opposite direction without wasting any time on repositioning. During transport, the swing legs are swung in.

The other model - the SP 124 Li/SP 124 L - also has a rigid crawler unit connection, like the previous model SP 1200. What is new, however, is the higher steering angle achieved by equipping all four crawler units with slew drive as standard, which gives them greater flexibility than their predecessors. During transport, the crawler units are turned in by 90 degrees. Due to the SP 124 Li/SP 124 L's compact dimensions, the transport dimensions are also relatively small in relation to the performance class.

Both the SP 124i/SP 124 and SP 124 Li/SP 124 L can be configured to suit any application. They feature a wide range of options, such as a self-loading dowel bar inserter (DBI) with fully automated dowel magazine, tie-bar and side tie-bar inserter, or trough systems, each of which is tailored to the different global requirements for inset applications.

Wirtgen's development of the new SP 120 series of inset pavers also focused on user-friendly machine operation and synergies with the SP 60 and SP 90 series. As a result, the demand-optimised Eco Mode engine management system, for example, helps reduce fuel consumption and noise emissions by adapting performance to application requirements. A tried and tested 3D interface offers reliable compatibility with 3D control systems from leading suppliers, making it future-proof. Furthermore, the efficient WITOS FleetView telematics system provides fleet management, position and condition monitoring, as well as maintenance and diagnostic processes. ■

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



The rugged design of Wirtgen's SP 124i/SP 124 and SP 124 Li/SP 124 L slipform pavers delivers consistently high performance in concrete paving and high-precision paving results, even in difficult site conditions.

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## Various Mapei systems for building and construction

One of new waterproofing solutions from Mapei is Purtop Easy, a ready-to-use polyurethane membrane designed for roof waterproofing. The system can be applied with just a single coat. It has high elasticity, excellent bond strength to substrates and is fully permeable. Besides being resistant to ponding water, it is also resistant to root penetration and UV rays.

For basement waterproofing, Mapei has developed Mapeproof FBT, a synthetic waterproofing membrane with non-woven fabric backing. It can be used in conjunction with Mapeproof FBT Tape and Mapeproof SA Tape for waterproofing below-ground structures before casting concrete. Mapeproof FBT can be fully bonded to concrete and overlaps 100% watertight. It is impermeable to radon and methane, making it safe for residents in the building. It is also resistant to root penetration.

To prevent corrosion on reinforcement structures, Mapei offers its galvanic cathodic protection system. It utilises Mapeshield reactive zinc anodes that create a galvanic cell with the steel, which, as a result, is passivated and remains protected against attack from corrosion. The system protects the reinforcement rods even if the concrete cover is insufficient and/or is cracked due to shrinkage or external stresses.

The Mapei galvanic cathodic protection system is quick and easy to install, with no maintenance required for the entire service life of anodes. This system is useful for protecting against corrosion on older structures and also increases the durability of new structures.

For decorative flooring, Mapei has introduced its Mapeflakes flooring system and Terrazzo system, suitable for indoor areas that require a high aesthetic appeal. This can be complemented with Mapecoat ACT, enamel wall paints developed specifically for F&B and health sector facilities, while adhering to international standards. It can also be applied in homes and places that need a high level of hygiene such as childcare centres.

Moreover, Mapei Ultralite S2 is a one-component, high-performance, cementitious adhesive for large-sized thin tiles installation. It can also be used with any ceramic tiles. The system is classified as C2E S2 according to EN 12004 standards.

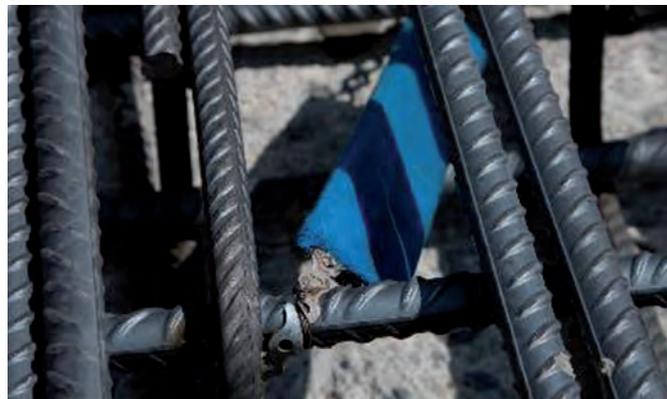
Featuring a high buttering capacity, Ultralite S2 reduces the risk of gaps in the adhesive on the backs of tiles, thus avoiding the risk of failure in tiles during application. The system is capable of absorbing deformations in the substrate and in the tiles. Thanks to its low viscosity, Ultralite S2 is easy and quick to apply as well. Plus, the long open time and adjustment time makes laying operations simpler.

Ultralite S2 comes in a 15-kg bag, weighs lesser but can cover as much as a conventional 25-kg cementitious adhesive of the same standards. This allows for easier handling and savings in transport costs. In addition, the system has low emission of volatile organic compounds, making it safe for both the environment and the users. ■

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



Mapeproof FBT is a synthetic waterproofing membrane featuring non-woven fabric backing, which is ideal for basement waterproofing. The system can be fully bonded to concrete and overlaps 100% watertight.



TOP AND ABOVE: Mapei's galvanic cathodic protection system is designed to prevent corrosion on reinforcement structures. The system uses Mapeshield reactive zinc anodes that create a galvanic cell with the steel, which, as a result, is passivated and remains protected against attack from corrosion.

## Goldhofer updates PST/SL vehicle



Vanguard Company transports a giant Komatsu excavator (weighing about 800 t) using the Goldhofer PST/SL 6 + THP/SL 8 vehicle combination.

## Terex RT 90 crane

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

Operators can access lift information through the Terex IC-1 control system, which delivers an efficient and intuitive touch-screen operation as well as all load charts. The electro-proportional joysticks and an integrated system design provide the operator with precision controls.

The Terex RT 90 also features four steering modes, including two-wheel, four-wheel, crab and independent rear axle steering for easy positioning and extensive versatility on the jobsite. With a narrow width of just 3 m and removable counterweight, the crane can be trailered without weight and width restrictions in most situations.

The Terex RT 90 is in compliance with both European and US regulations (RT 100US for North and South America), and is available with either a Tier 4F or Tier 3 engine to serve the global markets. ■

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



The Terex RT 90 rough terrain crane has a five-section, fully hydraulic boom that extends to 47 m.

Goldhofer has updated its PST/SL series, which is designed for transporting ultra-heavy loads. A highlight of the vehicle is the wide range of combinations available with the SL modules. With a full choice of additional equipment, they can be combined to create configurations that are precisely tailored to specific applications.

According to Goldhofer, the previous PST/SL generation was a popular choice for extreme load capacities and bending moment in combination with low deadweights, and these well known characteristics have been enhanced further in the new version of the vehicle.

The updated PST/SL series features a reinforced frame for an even higher load capacity. The main advantage of the vehicle, however, is the Speedrive option, which allows the drive axles to be operated in a free-wheel mode. Goldhofer said that depending on national regulations, the self-propelled modules can also be towed under full load in order to speed up the overall transport operation. Thus, the Speedrive technology can lead to significant savings in time and operating costs.

Furthermore, the new PST/SL generation offers a full 26% increase in tractive power, added Goldhofer. All of these features make Speedrive the key to faster and safer heavy-haulage operations. ■

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

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## Liebherr 125 K crane and PR 736 G8 crawler tractor

Liebherr's new 125 K fast-erecting crane has been specially developed for civil engineering requirements such as road traffic bridges and commercial as well as industrial building construction projects. The crane has a considerable initial hook height of 29.5 m as standard. Five tower sections can be additionally inserted to reach a total hook height of 41.5 m, and the 30-degree luffed jib position enables an impressive 65.5 m hook height.

The 125 K provides a maximum load capacity of 8,000 kg and with a 55-m radius at the jib head, it can lift up to 1,300 kg thanks to the Load-Plus function. There are five radius options, ranging from 35 to 55 m. The 3.2 m slewing radius allows the crane to fit into small spaces. This variable slewing radius can be extended to 4 m, so the amount of transportable ballast can also be reduced - which in turn reduces costs.

Besides features such as the Micromove fine positioning mode and Liebherr's two-line operation Speed2Lift, other improvements include site lighting, which is now available with LED floodlights to ensure better site illumination. The external K-crane cabin is also available for excellent visibility.

Furthermore, the 125 K can be towed as a trailer by a conventional truck. For this, Liebherr offers a new solution: the LiTRAX axle system. The company has developed a new 80 km/hr high-speed axle that is suitable for the current fast-erecting crane range. It can be used in a modular manner and consists of three units: a front axle as well as one rigid and one steerable rear axle. As a result, a 53 K or a 65 K.1 can be transported using the front axle and only part of the rear axle. For an 81 k.1, a tandem axle can be assembled using two individual rear axle modules. With these three units, it is possible to select the optimum combination for all Liebherr fast-erecting cranes, enabling them to be compact and flexible on site.

The axle system is equipped with advanced operation safety technology, such as an electronic braking system that allows for fast response when braking. The highlight, however, is the electronic stability control system. Sensors measure the lateral acceleration and detect tilting tendencies early on. Breaking intervention is specifically applied to individual tyres and the axle is stabilised. This prevents loss of control, especially in the case of unexpected braking manoeuvres or difficult weather conditions, and therefore ensures a significant increase in crane transport safety.

In addition, Liebherr's new generation 8 crawler tractor - the PR 736 G8 - has an operating weight of up to 25,500 kg. Various blade versions (straight, semi-U and six-point blade) with capacities ranging from 4.1 to 5.56 cu m as well as many rear equipment options are available to cover a large application range.

The PR 736 G8 is powered by a new Liebherr diesel engine belonging to the Evo series (160 kW), which meets Stage V emission standards. Customers in low regulated markets also have other engine versions and equipment levels to choose from.

The operator's cabin has been improved to make it more ergonomic and productive. A grab handle with integrated joystick for the rear ripper is used to guarantee stability when driving on uneven terrain. Standard climate control keeps a constant cabin temperature even in adverse weather conditions. The large 9-in display is the new information and control station for all relevant operating data.

The Liebherr Operator Assistance Systems (OAS) on the generation 8 crawler tractors provide three assistance levels: Free



Liebherr 125 K fast-erecting crane offers a 55-m radius and a maximum hook height of 65.5 m.



Liebherr PR 736 G8 crawler tractor has a maximum operating weight of 25,500 kg and various blade versions with capacities from 4.1 to 5.56 cu m.

Grade, for active blade stabilisation during fine grading; Definition Grade, for automatic blade positioning when creating 2D grades; and 3D Grade, as an optional GPS machine control system to model complex terrain shapes. The Liebherr Active Sensor Control to stabilise all blade axes is fitted as standard. Two independent, permanently mounted integrated sensor circuits (gyroscopic and inertia sensors) enable high grading speeds and perfect fine grading at all times.

The electronically pilot controlled work hydraulics allow for swift work cycles at high precision. It can be optimally adjusted to the operating conditions and the operator's requirements. Apart from the hydrostatic drive system, the proactive performance adjustment system and the Eco mode have also been adopted from the generation 6 crawler tractors. The new six-point blade with increased capacity (up to 4.84 cu m) improves production output and facilitates grading with its optimised linkage geometry.

The PR 736 G8 is also fitted with the standard LiDAT fleet management system that delivers information on localisation as well as the machine's operation, such as its position, operating and usage duration, fuel consumption and service interval information. ■

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

# Ammann lightweight equipment for restricted jobsites

The new generations of Ammann ATR rammers and APH hydrostatic vibratory plate compactors provide both access to confined areas and ease of transport that contractors require.

The ATR rammers feature a low centre of gravity, delivering outstanding forward-moving abilities that make operation effortless. Balance is also improved, preventing tipping and making it easy for the operator to guide the machine.

A patented process enables the rammer height to be easily adjusted, a significant benefit as the operator can continually also make modifications to maximise manoeuvrability and comfort throughout the shift.

The handle, the height, proper shoes and enhanced control make the Ammann ATR rammers easy to navigate and operate regardless of experience level. The reduced-vibration handle can be gripped from all sides, allowing easy access to tight spaces. The operator can turn the machine 180 degree to reach confined areas while maintaining optimal control of the rammer at all times.

With a central lifting hook device, the rammers can be lifted easily, whether they are being transported to another spot at the project site or loaded on a vehicle. Rollers on the handle prevent damage to the truck bed. Optional transport wheels make it even easier to transport the rammer around the jobsite.

In addition, the APH hydrostatic vibratory plate compactors utilise Ammann's innovative orbitrol steering. This fully hydraulic, intuitive tool provides precise control and leads to simple operation. The machine can be operated from behind or, if space gets particularly tight, from the side. The handle can be tilted during operation to further improve access.

The triple-shaft exciter system makes the APH compactors easier to operate while increasing their power and compaction forces. The system keeps plate movement consistent, which in turn enables smooth travel – even through heavy, cohesive soils, and helps overcome steep grades.

The APH compactors can also climb while backfilling saturated areas. Their central lifting hook makes lifting and relocating easy, while large tie-downs secure the machine during transport. ■

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



**TOP:** The machine balance and well-designed handle make work with the Ammann ATR rammers simple and safe for the operator.

**ABOVE:** The Ammann APH plate compactors are fitted with a triple-shaft exciter unit for excellent compaction results and running behaviour, while the orbitrol steering allow for ideal machine control and precision.

**LEFT:** The APH plates also feature a central lifting hook for easy lifting, as well as generous tie down points for secure transportation.

## Brokk hydraulic breakers

The Brokk Hydraulic Breaker (BHB) series has been perfectly matched with the company's full range of remote-controlled demolition robots. Basically, each robot is designed from the attachment backward, providing the exact amount of flow, pressure, backpressure, and downward force that the hammer requires, which offers the best possible demolition performance to Brokk customers.

The BHB series includes eight breaker models, starting with the 50-kg BHB 55 breaker for the compact Brokk 60 remote-controlled demolition machine. The range goes all the way up to the 700-kg BHB 705 for the Brokk 500 and Brokk 520D.

Like Brokk remote-controlled demolition machines, the BHB series has a high power-to-weight ratio. The attachments are lightweight and compact, yet feature power similar to larger, heavier breakers from other manufacturers. The hammer bodies are machined from a solid casting, eliminating side and through bolts, along with the side plates found on many other hammer designs. An integrated, side-mounted accumulator holds a nitrogen gas charge for as long as a year.

Brokk demolition robots and breakers are designed to work at maximum performance together, leading to more total demolition power. Brokk engineers its demolition machines starting at the



Brokk BHB 455 breaker.

tip of the breaker for maximum compatibility. This includes reducing back pressure and optimising machine oil flow, oil pressure and down pressure to allow for more hydraulic power while using less energy. According to Brokk, the result is that its demolition robots are able to provide the highest power-to-weight ratios in the industry, allowing contractors to substitute robots for much larger excavators, and achieve the same concrete removal rates. ■

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

## Cross-Hole Analyzer from Pile Dynamics

The Cross-Hole Analyzer (CHAMP-Q) from Pile Dynamics determines the quality and consistency of the concrete of drilled shafts, slurry walls, bored piles, cast-in-situ piles and other types of concrete foundations. The CHAMP-Q tests a maximum of four tubes (six profiles) in a single pull for ease and efficiency of data collection, with up to six times improvement in speed of testing. The CHAMP-Q's colour-coded transceivers optimise real-time data entry for speed of testing and minimisation of erroneous input. In addition, the CHAMP-Q offers enhanced 3D tomographic analysis with PDI-TOMO software. ■

Website: [www.pile.com/products/champ-q](http://www.pile.com/products/champ-q)



LEFT: The CHAMP-Q determines the quality and consistency of the concrete of drilled shafts, slurry walls, bored piles, cast-in-situ piles and other types of concrete foundations.



ABOVE AND RIGHT: The colour-coded transceivers optimise real-time data entry for speed of testing and minimisation of erroneous input.



# Haulotte Star vertical masts to meet various needs

Haulotte Star vertical masts are designed mainly for maintenance and indoor finishing works, but they are also suitable for events, logistics and distribution. Featuring a compact dimension and straight elevation, these lifts can climb to a working height of 6 to 10 m.

The Star range delivers a forward speed of 4.5 km/hr, enabling it to move quickly and ensure optimal productivity. Its smooth elevating and driving functions - thanks to the AC motors - allow operators to work comfortably even in hard-to-reach areas. With the machine's narrow turning radius, operators can also manoeuvre in highly restricted spaces.

The Star masts have a gradeability of up to 25%. Their non-skid step allows a safe entry in the platform, which remains stable while raising and lowering the mast. Their non-marking white tyres are suitable for all types of soil.

The masts have no cables or chains, guaranteeing minimum maintenance. Their control points are directly accessible, and their asynchronous motors also require no regular maintenance since there are no carbon brushes to be replaced. The Haulotte Activ'Screen on-board diagnostic tool provides operators and

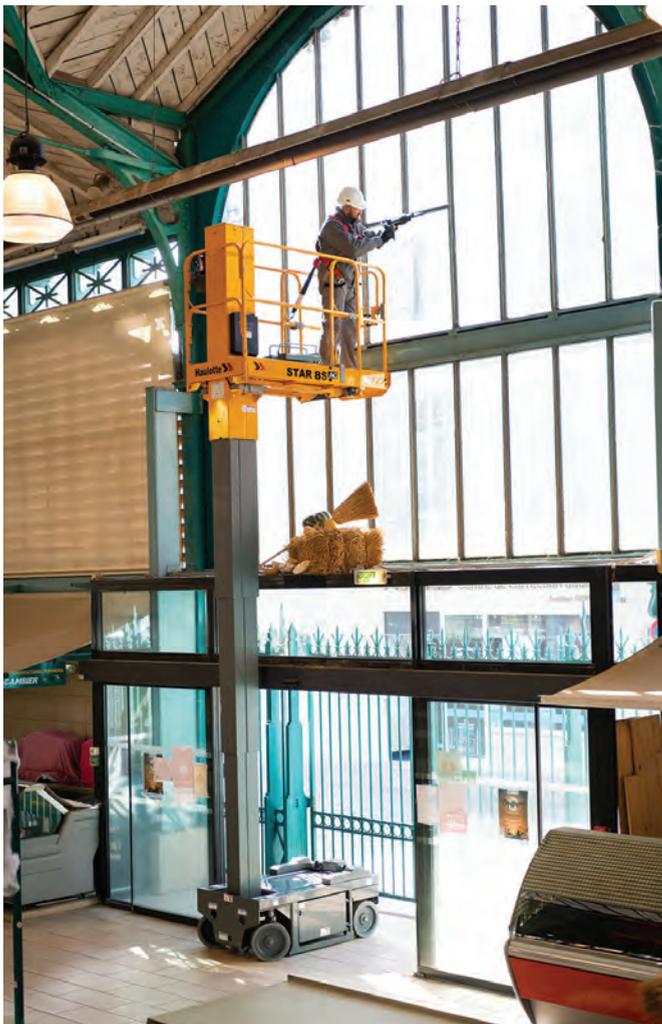
technicians with key information. As such, they can have a full control over the machine.

The Star 6 and Star 8S vertical masts can manoeuvre efficiently and quickly. Combining high torque with precise and smooth control, their AC motors provide excellent precision and comfort during operation. Both machines are available with a basket extension, providing additional space and a further reach of 40 cm.

Ideal for indoor applications, the Star 6 Picking mast can safely lift up to 80 kg of loads at once. Its motorised picking tray can be elevated to enable operators to lift packages with no strain. The machine also features removable side panels and a front-end guardrail to protect the loads. Thanks to its dual side doors, the Star 6 Picking can be parked on either side of the shelf. The Lambo doors do not take up space on the platform, offering operators complete freedom of motion.

The Star 8 and Star 10 masts have a 3-m outreach vertical jib, enabling access to the most difficult-to-reach places. Control and manoeuvring while elevated is intuitive and precise. The machines can work in any area where the chassis fits, as there is no tail swing. Versatile, they are designed for indoor or outdoor use on hard surfaces. ■

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



The new Star 8S is available with a basket extension, providing additional space and a further reach of 40 cm.



The Star 10 mast has a 3-m outreach vertical jib.



Haulotte vertical masts feature a compact dimension and straight elevation, with a working height of 6 to 10 m.

# Aquajet power packs for hydrodemolition operation

Aquajet Systems offers three power packs for powering its Aqua Cutter hydrodemolition robots: the standard Aqua Power Pack, the Ecosilence and the Aqua Skid. The power pack is a combination of diesel engine and high-pressure pump, necessary for hydrodemolition operation.

The Aquajet power packs are cost effective and easy to transport and set up. The standard Aqua Power Pack contains more than just motors and pumps to power the Aqua Cutter; the container also serves as storage for machine accessories and tools. A built-in workbench with a vise provides contractors a space for jobsite maintenance and a place to store spare parts. Operating at as high as 43,500 psi, the standard Aqua Power Packs are available in multiple versions: Aqua Power Pack 270, 400 and 700.

Similar to the Aqua Power Pack, the Ecosilence provides everything contractors need in a quieter package. Both the standard and Ecosilence measure 7 m by 2.4 m by 2.6 m. The container's sound-absorbing design features insulated walls and double doors, as well as seals on all doors and hatches. According to Aquajet, the Ecosilence offers noise levels less than half that of competitive high-pressure units on the market. With an average of 57.5 dB, the unit is ideal for use in urban areas that have high noise restrictions. Aquajet said that users will also see an improved fuel consumption of as much as 10% compared to alternative high-pressure units.

The Ecosilence can be equipped with a roll-off frame for simplified on/off truck loading and transport. Maintaining the same dimensions of the standard power pack, the Ecosilence is available in two sizes: the Power Pack 400 and 700 and operates at as high as 18,700 psi.

Aquajet's compact Aqua Skid power pack measures 2.6 m by 1.8 m by 1.7 m and provides the same performance and basic functions as the containerised packs, just in a smaller footprint. The compact high-pressure unit is designed for installation on a truck, trailer or local container, which is ideal for contractors or operations with space restrictions, such as plants or factories. Operating at 43,500 psi, this power pack offers contractors a fast and easy way to upgrade an outdated high-pressure unit, plus, the Aqua Skid can be used in areas where metal enclosing - such as the exterior of the standard power pack or Ecosilence - is not necessary or possible.

Aquajet's power pack series requires fuel and water to operate. Each is equipped with the Revo Control System, which displays the necessary information to control and monitor the power pack. An optional extension of that system is the Revo Remote Control System, which allows for operation away from the power pack. Each Aqua Pack comes standard with a Volvo engine. Customers can opt for an engine from a different manufacturer, if necessary.

In addition, the hydrodemolition machine's remote control can be seamlessly paired to the pump unit. This feature allows the operator to turn the flow on and off and control the flow of



ALL IMAGES: Aquajet Systems offers three power packs for powering Aqua Cutter hydrodemolition robots, including (from top) the standard Aqua Power Pack, the Ecosilence and the Aqua Skid.

the high-pressure water as well as operate the robot from one remote. In the case of an emergency, the operator can completely shut down and depressurise both units from the emergency stop button on the remote, the robot or the power pack.

To enhance safety, an engine shutoff option on the remote allows for quick shutdown in the field, depressurising the pump and pressure hose and reducing engine rpm to a low idle. ■

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



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# Ammann plays role in major road projects in Asia

An Ammann ABC 140 SolidBatch asphalt plant has been used by Tamaka Asphaltic Company to help build a new road in Thailand, connecting local communities to a major new highway in Southeast Asia.

The newly built road links Kanchanaburi Province in western Thailand to the Southern Economic Corridor, which runs from Myanmar through Thailand and Cambodia – and eventually to two ports in Vietnam.

According to Tamaka, the Ammann plant has an advanced technology that was needed to produce the mix on this project, especially the as1 Control System. This as1 software recorded production data and showed the precise total weight of hot mix to be paved; it can provide good reports about fuel consumption and operations.

Tamaka added that the plant's 50 t hot-mix silo also saved the company in terms of truck management and optimising the total number of trucks used.

Tamaka handles many roadbuilding projects for various divisions of the Thai government. The company's completed road project connecting local Thai communities to the new corridor aims to provide improved access to businesses along this trade route, and offers an important long-term boost to the Thai economy.

In India, Ammann ARS 121 soil compactors are currently handling soil work for a key section of the 354-km Purvanchal Expressway. It is said to be the longest road construction project in the country. The soil work is being carried out by Ms. Regal Enterprises, a subcontractor of Ms. G.R. Infra.

The ARS 121 features machine comfort, allowing the operators to be productive throughout their long shifts. The vibratory system and compaction output of the ARS 121 have reportedly enabled the project crew to achieve goals in fewer passes. So successful were the machines that Ammann has delivered additional units for more work on the expressway.

According to Ammann, the operators said they have worked with competitive machines and found the ARS to be more fuel-efficient, possess better compaction effectiveness and be easier to control. Plus, it required virtually no maintenance.

Once completed, the Purvanchal Expressway will provide easy access to the national capital of New Delhi via the 302-km Lucknow-Agra Expressway and the 165-km Agra-Greater Noida Yamuna Expressway. In addition, the Purvanchal Expressway will have uninterrupted connectivity to nine districts: Lucknow, Ghazipur, Amethi, Azamgarh, Faizabad, Barabanki, Mau, Ambedkar Nagar and Sultanpur. ■



LEFT: The Ammann ABC 140 SolidBatch asphalt plant has helped to build a road in Thailand, connecting local communities to a major new highway in Southeast Asia.

BELOW, MIDDLE AND BOTTOM: The Ammann ARS 121 soil compactors are currently handling soil work for a key section of the 354-km Purvanchal Expressway in India.



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

# GCP waterproofs new highway between HK and Shenzhen

The Liantang/Heung Yuen Wai Boundary Control Point, also known as the Liantang Highway, is designed to provide a direct transport link and expedite travel between the northeast New Territories in Hong Kong and Shenzhen East on Mainland China. The new highway is also expected to alleviate traffic and congestion at the two existing boundary control points at Man Kam To and Sha Tau Kok, on the eastern side of the New Territories.

Covering 57 acres, the Liantang Highway project includes construction of an 11 km two-lane concrete road bridge linking the new highway with Fanling Highway; border patrol buildings and associated facilities; improving about 4.5 km of Shenzhen River between Ping Yuen River and Pak Fu Shan and re-provisioning Chuk Yuen Village.

Key challenges of the project involved finding a way to effectively prevent water ingress on the concrete road bridge deck, reduce the risk of waterborne contaminants and prevent the onset of early corrosion. The contractor needed a waterproofing system that was compatible with the structure's design-life requirement; engineered to provide sufficient bond and movement with the substrate and asphalt paving; tough and suitable for fast-tracking application, particularly during Hong Kong's wet and humid seasons. The bridge deck waterproofing solution also needed to have a track record of meeting strict construction and technical compliance, plus stringent lab testing.

The main contractor, Chun Wo Construction Holdings Company Ltd, finally selected the Eliminator bridge deck waterproofing system from GCP Applied Technologies to protect the concrete road bridge section of Liantang Highway. The Eliminator waterproofing membrane's formulation, which is based on Esselac technology, allows for application in high humidity while providing rapid full cure and early trafficability.

The cold-spray-applied Eliminator system ensured ample tensile and shear bond between the asphalt paving and membrane. It also provided Chun Wo Construction with significant speed and efficiency advantage over traditional hot melt-type bond coats, without compromising quality and performance. Plus, the use of airless pumps made it fast and easy to apply and maintain.



The new highway is designed to provide a direct transport link and expedite travel between the northeast New Territories in Hong Kong and Shenzhen East on Mainland China.



The Eliminator waterproofing system from GCP Applied Technologies being applied on the concrete road bridge section of the new Liantang Highway using an airless-spray machine.



GCP's Eliminator system forms a tough, flexible and seamless membrane with no vulnerable joints, allowing it to perform throughout the design life of a structure while simultaneously reducing maintenance costs.

Advance Specialist Treatment Engineering Ltd was tasked to apply the Eliminator system on the project. The company said it could apply the system on the concrete substrate seven days after the pouring, on an area of about 1,000 sq m a day in good weather condition and with relative humidity up to 98%.

On the Liantang Highway project, two coats of Eliminator waterproofing membrane were applied. The first coat was a distinctive yellow, followed by a second coat that is light grey, enabling superior quality control over one-coat membranes.

The Eliminator system forms a tough, flexible and seamless membrane with no vulnerable joints, allowing it to perform throughout the design life of a structure while simultaneously reducing maintenance costs. Its installation causes minimal disruption, and it is capable of supporting traffic just an hour after application. The system allows for wet film thickness gauge checks to ensure the specified film thickness is achieved across the area before curing. ■

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

## Goldhofer transports turbine sets for Thailand wind farm

For the construction of a wind farm in eastern Thailand - which reportedly has the highest turbine towers in Southeast Asia - the British heavy-haulage company ALE Heavylift has been awarded a contract by Sattahip Port to transport 13 turbine sets to their destination at Rom Klao, located in the province of Mukdahan. These turbine sets feature a diameter of up to 5.4 m and a weight of up to 100 t.

To meet the tight three-month schedule, ALE collaborated closely with Goldhofer. The 860-1,000 km long route was deemed challenging, especially for some of the cargoes. The journey also required extensive planning: overhead power lines had to be lifted, roads had to be cleared of various obstacles, and additional parking spaces had to be created for convoys with three trailers.

The 143 components from which the wind turbines were to be assembled were placed on a wide variety of Goldhofer vehicles. Six extendible semi-trailers of the SPZ-P series were deployed to carry the rotor blades. With the help of coupled THP/SL heavy-duty modules, the nacelles and upper tower sections for the turbines were transported quickly and safely to their destinations. For the rotor hubs, eight-axle semi-trailers were used.

The tower segments, with a diameter of 5.4 m, were loaded onto THP/SL heavy-duty modules fitted with Goldhofer RA 4 and RA 2 tower adapters. The RA 4 tower adapters were specially modified to meet ALE's requirements, i.e. compliance with local weight and height restrictions plus efficient transportation of the extremely heavy and large components.

Thanks to the free turning feature and the general flexibility of the system, ALE was able to complete the journey with its off-



ALE Heavylift deploys Goldhofer vehicles to help transport 13 turbine sets to a wind farm project in Rom Klao, located in the Thai province of Mukdahan.

road sections and tight bends and obstacles without any problems. Some of the vehicles were shipped to Thailand by airfreight, said Goldhofer, so that the operation could begin on time despite the short lead time. All in all, more than 200 Goldhofer vehicle axles were involved in ensuring reliable delivery of all the equipment to the construction site. ALE was awarded another contract in the middle of 2019 to transport five more wind turbines, which were even larger and heavier. ■

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

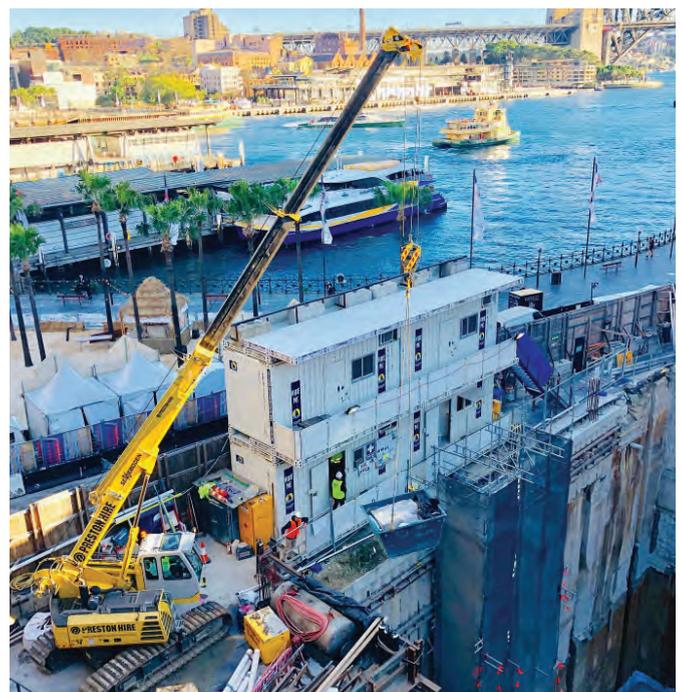
## Sennebogen 613 goes to Opera Residences in Sydney

The Opera Residences project is currently underway in Sydney, Australia. Slated for completion in 2021, it consists of a 19-storey tower with 104 luxury apartments right in the heart of Circular Quay. It will also have restaurants, a swimming pool, a fitness studio, six underground parking levels and a retail section on the ground floor. Situated by the water on the east corner of Circular Quay, the development has views of Harbour Bridge, the city skyline and the Museum of Contemporary Art.

This strategic location, however, presents a particular challenge during construction, as downtown building sites often go hand in hand with space restrictions. For this reason, Australia-based rental company Preston Hire decided to deploy a Sennebogen 613 telescopic crawler crane for contractor Richard Crookes Constructions. The machine features a compact dimension and it can be transported easily and efficiently. The telescopic undercarriage and small turning circle are also important when it comes to projects with limited space.

The Sennebogen 613 is able to lift up to 16 t and all sections of the series-standard full-power boom can telescope variably and continuously. It can even telescope whilst fully loaded. The boom's maximum length of 18.8 m and the folding fly boom's 5 m reach means the crane can cover a wide area, whilst remaining compact and agile. In addition, the crane's comfort Multicab allows the operator to have an excellent view of the jobsite. ■

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



A Sennebogen 613 telescopic crawler crane carries out lifting works on the Opera Residences project in Sydney, Australia.

# Wirtgen lays pavements for Beijing Daxing Int'l Airport

Wirtgen slipform pavers have helped to build the apron area at the new Beijing Daxing International airport, which was recently opened. The new airport is reportedly the world's second largest in terms of passenger volume, initially serving up to 45 million passengers per year, and is expected to have a total capacity of up to 100 million in the future. It is intended to relieve pressure on the existing airport in northeast of Beijing.

The cold winters in Beijing with low temperature of around 0°C was among the challenges faced by Beijing Sino-Aero Construction Engineering Co Ltd during the construction of the apron area. A total of four Wirtgen SP 500 slipform pavers were used to pave single-layer concrete slabs 5 m wide and 42 cm thick over fixed forms.

Levelling and steering parameters were communicated to the Wirtgen machine control system via stringline sensors. To withstand the high aircraft loads, the concrete slabs were reinforced by means of steel dowels. Thanks to the excellent performance and high machine availability, daily production targets could be easily achieved so the tough timeline was adhered to.

Minimising manpower was said to be one of the main criteria considered by Sino-Aero Construction Engineering. The company believed that Wirtgen slipform pavers were the right solution for automated, efficient concrete paving. The process ran smoothly and exactly as scheduled, and the robust paving mould slipformed the concrete, exceeding the required specifications. Electrical vibrators emitting high-frequency vibrations ensured optimum compaction of the concrete during the slipforming process. In addition, the oscillating beam and super-smoother put the finishing touches to the brand new pavement. ■

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

**RIGHT:** Despite some challenges during the construction of the apron area, such as cold winters with low temperature of around 0°C, Sino-Aero Construction Engineering was able to carry out the paving process smoothly and exactly as scheduled, with the help of Wirtgen machines.



**TOP:** A fleet of Wirtgen SP 500 slipform pavers works on Beijing Daxing International Airport to help construct the enormous apron area, with a parking capacity of 268 aircrafts.

**ABOVE:** Designed for over one flight movement per minute, the traffic areas need to withstand extremely high loads.



# Going underground... the Sandvik way

**S**andvik Mining and Rock Technology has introduced its latest development for tunnelling excavation, the DT1132i jumbo. The machine is equipped with the company's new high frequency RD535 rock drill, robust booms and advanced drill string guides, making it a complete high-speed drilling solution.

The DT1132i three-boom, electro-hydraulic jumbo has been designed for fast and accurate drilling in tunnelling and cavern excavation. This computer-controlled underground rig possesses both operator-controlled boom positioning and full-face automatic drilling functions.

All Sandvik DTi tunnelling jumbos feature a special modular design for high flexibility and versatility. They use advanced automated drilling solutions, such as iSURE tunnel management software and SICA intelligent control system.

With the RD535 rock drill automated drilling features and new rock tools, Sandvik said the DT1132i can deliver the results required but with 40% less exhaust



**TOP AND ABOVE:** The new DT1132i tunnelling jumbo is equipped with Sandvik's new high frequency RD535 rock drill, robust booms and advanced drill string guides, making it a complete high-speed drilling solution.

particles, up to 20% higher penetration rate and with 25% more side coverage (3 x SB160i 190 sq m - 19,400 m x 12,200 m).

The rig design is also intended to maximise operator safety and ergonomics,

with improved fleet standardisation (high parts commonality) enabling extended rig usage across different jobsites.

The new 3-m TB160i telescopic boom is optimised with a front wrist structure

that provides 1 m additional side coverage as standard, and 4-m side coverage with telescopic adjustment. The boom also employs a new fully proportional boom control for accurate and fast manual boom handling (automated boom controls come with the optional Platinum package), with intelligent compensation models to give accuracy in all operating conditions.

An ergonomic vibration-dampened cabin provides the operator with excellent all-round visibility, low noise level inside the cab thanks to its acoustic windows, a filtration system to minimise dust inside the cab (according to standard EU6/7), and an open and spacious operator environment. Doorways have been located in the rear of the cab to minimise any disturbance for the operator, whilst safety has been maximised with a FOPS-compliant cabin.

To further boost the efficiency of the rig and the operator, comprehensive diagnostics information is integrated into one display. These include drilling diagnostics for boom instrumentation, drilling control system and shank lubrication, together with carrier diagnostics for electric motors, pumps (hydraulics and water), transmission system, diesel engines, brake system, jacks and cable reels.

The RD535 is a high performance and high frequency rock drill. It has maximised



The 3-m TB160i telescopic boom is optimised with a front wrist structure that provides 1 m additional side coverage as standard, and 4-m side coverage with telescopic adjustment.

power transfer capabilities, leading to a high drilling speed without compromising hole quality. It also offers an efficient and powerful percussion mechanism, as well as a tool-saving, efficient and stabiliser structure for increased reliability. These features, together with improved flushing and efficient cooling, deliver an uninterrupted high-speed drilling.

The DT1132i is powered by a Cummins B6.7 (168 kW) diesel engine (Stage 5),

which can be operated up to 5,000 m above sea level without any modifications. Sandvik said the drill rig is also available with a Stage 3 engine.

The rig utilises a new carrier, which has more efficient hydraulic and water systems. These include separate circuits for both drilling and tramming hydraulics, proportional flushing valves to adjust the flushing flow and inlet/outlet pressure monitoring.

## Updated iSURE 8.0 underground rock excavation software

iSURE (Intelligent Sandvik Underground Rock Excavation) software is a computer programme for tunnelling, construction and mining drill and blast process control, producing all the data needed for optimising the drilling and blasting cycle. It has a template-based drill plan generation tool that takes into account rock blastability, tunnel profile, quality target and explosives used. The key lies in the fact that successful operations consist of four essential points - quality, cost, schedule and safety - and the software is designed to help ensure the best results are achieved, by making drilling and blasting even more accurate.

### Data driven productivity

iSURE 8.0 enables drill rig usage and drilling process efficiency to be maximised, assessed and measured on a round-by-round basis. Counters for percussion, power pack, drilled meters and net penetration, as well as average and gross drilling capacity [m/h/boom], are collected for each boom. A round's duration is divided into main categories for navigation, drilling, boom control, idle time, or booms not finishing the job at the same time, further allocating them into sub-categories for drilling and boom. This



offers valuable feedback that helps to finetune the rig's behaviour, while also acting as a learning tool for operators.

The programme also assists in the analysing of data collected along tunnel line, which reveals the trends of various KPIs. In addition, analysing the 'measurement while drilling' (MWD) items gives a histogram report of the achieved penetration rate for the used drilling power, flushing sufficiency or disturbances in drilling, both in general terms and each boom.

All of these features are achieved through the full-featured iSURE 8.0 software utilising the drill rig's data collection, thereby improving the work cycle and the drill and blast excavation process. It also has an optional toolset for geological analysis (iSURE Geo), a tunnel profile 3D scanning system (iSURE 3D Scan) and an

interface to a third-party blasting vibration feedback system.

Optional onboard scanner records the tunnel profile at the face. iSURE 8.0 creates surfaces based on scanned point clouds with a 3D view with under/overbreak visualisation and a 2D view for feedback to drill and blast design optimisation, along with production in numbers (realised, theoretical, under/overbreak cu m).

Geo option includes rig and iSURE calculation and produces geological mapping information based on the drilling data. Parameters like Sandvik drilling resistance factors (MPa), rock mass fracture indicator, rock classification are calculated and extrapolated. 2D tunnel map views and 3D with cut planes are presented.

The new version of iSURE 8.0 comes with several features: wizard-tool to select ready-made drilling templates for drill plan creation; cloud system to share data; new user interface; new license system; excavated profile target quality; and drilling rate index based estimate calculation for cycle (round) time. New inbuilt cloud based data sharing helps to spread the project data between the group members. Cloud data is owned and controlled by rig owner, defining roles and access rights for members. ■



Sandvik has expanded its 800i series of connected cone crushers, which provide reliable and intelligent crushing to any mining or aggregate application. These crushers are available in three models: CH830i, CH840i and CS840i.

The rig steers by hydraulic rear wheel steering and its electric current reducer unit provides electric reactive power element (kVar) from an onboard capacitor, reducing electric current draw by up to 20%. The 3 x 90 kW IE3 electric motors require 2.5% less energy, with all working lights based on LED technology, automatically controlled based on tramming direction and with directional lights available where needed.

A new feed - TF535i - also offers increased feed force for high power drilling, whilst a saving hose reel structure gives longer service life for the hoses which are of an increased size. A hose support structure enables the independent tightening of every single hose, thus reducing any pressure drop. An integrated accurate linear sensor ensures accurate rock drill positioning and a new slide piece design enables 50% less wear and friction.

The DT1132i is available with some of the most recent developments in automation, including the SICA control system for intelligent torque control/feed percussion, with monitoring and fleet management for My Sandvik. To further improve the excavation process, remote access via WLAN can be chosen, which allows web-based data transfer as well as online MWD (measurement while drilling).

As 'Gold' standard, the DT1132i is fitted with torque based semi-automated drilling, manual boom control and rod handling, all enabling drilling to a predefined depth with feed angle measurement and drill bit location measurement. Drill plan visualisation and rig navigation are also included. Apart from these standard features, the rig is also available as part of the 'Platinum' package with automatic long hole drilling and fully automatic face drilling.

For face drilling, the DT1132i comes with the new Sandvik Alpha 360 drilling system for the RD535 rock drill. This provides features such as an optimised rod diameter with increased flushing hole size, increased flushing and higher penetration rates, as well as a new Sandvik Alpha 360 connection. The latter possesses a new larger bit thread for increased drilling power and straighter holes, which gives higher advance rate per blast. For grouting, the GT38 system offers 50% less deviation and increased service life.

### Sandvik 800i series of premium cone crushers

Sandvik has also expanded its 800i series of connected cone crushers to include three new high-performing crushers: CH830i, CH840i and CS840i. They have been improved to offer reliable, intelligent crushing to any mining or aggregate application.

These crushers come with the new generation Automation and Connectivity System (ACS) as standard and are connected to the My Sandvik portal. This allows managers and operators to access and manage all the vital information needed to make informed decisions.

The My Sandvik portal can be accessed using a smartphone, tablet or computer. The ACS system continuously monitors and optimises crusher performance and controls the complete lubrication system, increasing uptime and reliability.

"New, digital technologies will transform the way mines and quarries work. My Sandvik is the first major step in gaining insights into productivity and predictive maintenance that will drive our industry forward. It's great to offer our customers a service that will truly make a difference to their profitability," said Mats Dahlberg, Sandvik's vice president for lifecycle service, stationary crushing and screening.

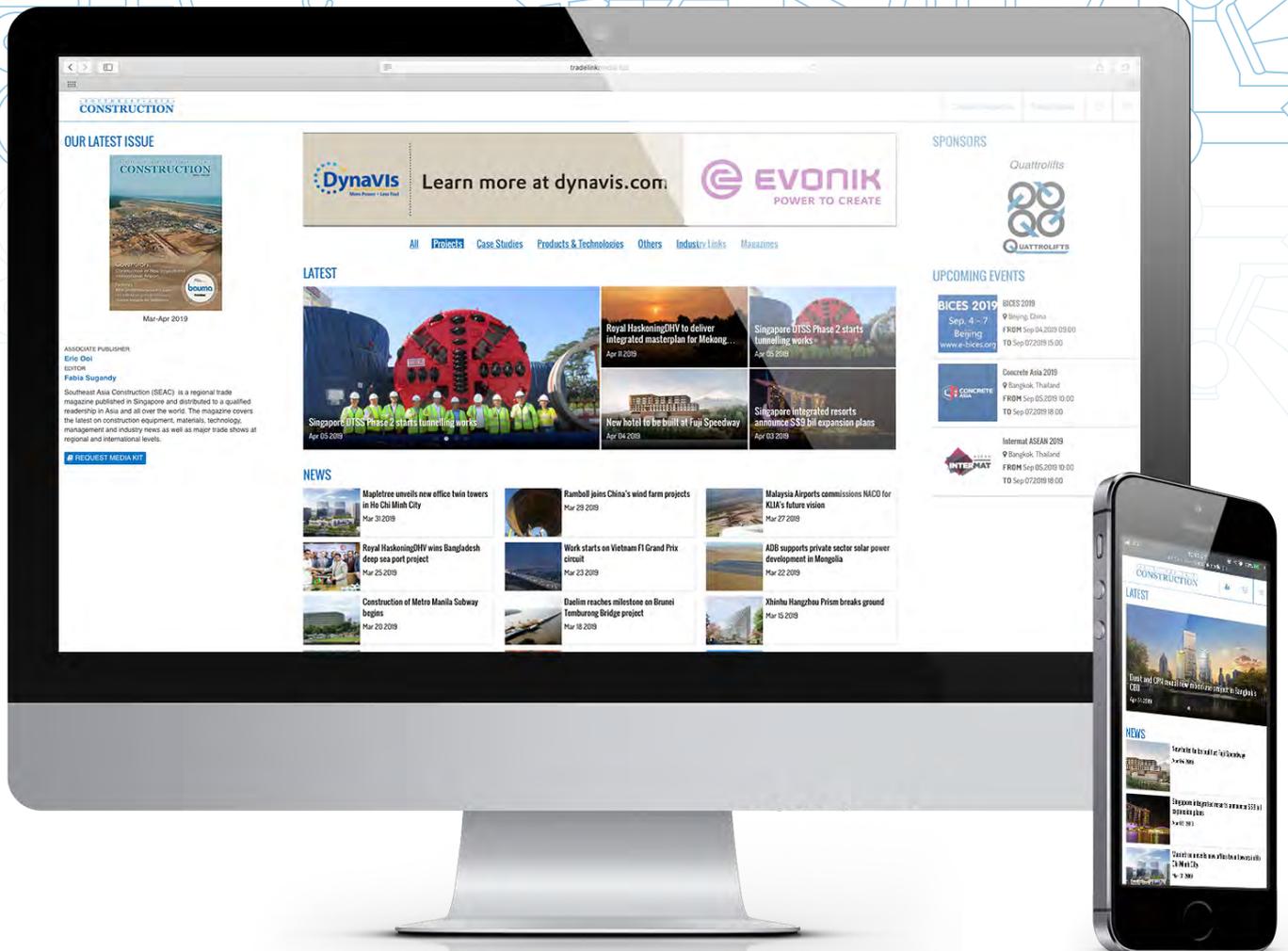
Bolted rather than welded top and bottom shell liners make changing 90% faster, said Sandvik. The over-pressure system keeps dust out, and the standard offline filter keeps oil cleaner, extending oil life by up to five times. More power output from less energy and more uptime through intelligent crushing allow the 800i series to become a safer and more sustainable choice.

According to Sandvik, the 800i crusher series can be purchased as a completely new crusher, or users can choose a Sandvik Reborn solution, replacing an existing crusher and reutilising existing auxiliaries and infrastructure. This plug and play installation minimise disruption and maximise productivity, while offering up to 40% cost savings compared to a complete crusher system.

Sandvik added that its service agreements provide customers with safer operations, low operating costs and long service life, unlocking the full potential of their crushing plant 365 days a year. It increases productivity by up to 10%. ■

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

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# Cementing Asia Pacific's infrastructure boom



TOP, ABOVE AND LEFT: The construction of 64-storey Tanjong Pagar Centre in Singapore relied on Concera admixtures to produce control flow concrete.

With the changing construction trends in Asia Pacific, GCP Applied Technologies is highlighting some of its innovations to help the concrete industry meet the increasing market demand. According to the company, there has been a push towards efficiency and sustainability across the region, which is driving three trends. “These include: growing demand for high-performance concrete admixtures for high strength, flowability and workability retention; increased use of high-performance clay mitigation and rheology-improving additives to maximise the use of manufactured sand, quarry dust and other alternate raw materials; and stronger focus on durable waterproofing solutions to protect infrastructure and transport system construction,” explained Dr. Zhong Hua, Asia Pacific product director for specialty construction chemicals at GCP Applied Technologies.

## High performance concrete admixture

The Concera admixtures from GCP enable the production of control flow concrete, providing high rheology and workability. This solution is ideal for companies looking for consistent, high-performing concrete that offers energy savings and greater durability.

“When contractors were building Singapore’s tallest building - the 290-m, 64-storey Tanjong Pagar Centre - they relied on Concera admixtures to produce control flow concrete,” said Dr. Zhong. “To expedite construction time and limit disruption in the congested financial district, the project used the top-down construction method, which is growing in popularity across Asia Pacific. This allowed the basement and above-ground levels to be built simultaneously.

“Control flow concrete also helped address another project challenge - pouring more than 13,500 cu m of concrete to

create the building's gigantic raft foundation. The 3,814-sq-m foundation required one of the largest concrete foundation pours in Southeast Asia."

Dr Zhong added that during the record-breaking 44-hour continuous pour, the concrete mix flowed easily in a controlled manner. Plus, the segregation-resistant concrete mix resulted in substantial noise pollution reduction. "Since the concrete filled irregular voids quickly, it eliminated the use of loud mechanical compactors, which are typically used to smoothly spread and compact the concrete for a stable foundation."

**Durable waterproofing systems**

Among its waterproofing solutions, GCP offers the Eliminator bridge deck waterproofing system; Ice & Water Shield self-adhered roofing underlayment; Preprufe pre-applied waterproofing systems; Bituthene post-applied waterproofing systems; and Adva concrete admixtures.

All of these systems played roles in the construction of the 55-km Hong Kong-Zhuhai-Macao Bridge, the longest sea crossing in the world that was opened last year. "Engineers on this project not only had to specify a waterproofing solution that passed all government requirements, but also one that was high performing and durable," said Dr. Zhong.

GCP's Eliminator waterproofing membrane is designed for high efficiency. The system is cold-spray-applied, which can be done quickly and it is able to seal complex, critical details and penetrations with ease.



Dr. Zhong Hua, Asia Pacific product director for specialty construction chemicals at GCP Applied Technologies. He oversees R&D and Technical Services for both cement and concrete technologies.

"Waterproofing in high humidity areas can be challenging and time consuming since some solutions require extended time before each coat can bond. However, with the Eliminator waterproofing membrane, it takes less than half an hour for each layer to cure. Instead of requiring expensive heater or spray machines, the Eliminator solution is applied using equipment that is simple to operate and affordable to purchase," explained Dr. Zhong.

On the Hong Kong-Zhuhai-Macao Bridge project, two coats of Eliminator waterproofing membrane were applied to three steel sections of the bridge. The first coat was a distinctive yellow, and the second one was grey. GCP said these different colours would make it easier for applicators to quickly confirm that the entire surface is properly waterproofed.



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GCP's Preprufe pre-applied and Bituthene post-applied waterproofing membranes were chosen for the bridge itself and its associated tunnel, which runs deep under the Lingding Ocean. The Adva concrete admixture was employed on the concrete portion of the bridge.

Dr. Zhong explained that for the tunnel, both Preprufe and Bituthene waterproofing membranes were selected for their fast application, which helped keep the project's tight completion schedule on track, while the ease of application helped minimise any human errors during placement.

"The two products are ideal for solving critical waterproofing issues, and were used to safeguard several tunnel passageways, including at the Hong Kong boundary crossing facilities and staff subway section. When combined, Preprufe and Bituthene membranes deliver a continuous waterproof barrier throughout underground structures and tunnels."

### Enhancing raw materials

Another highlight from GCP is the Clarena portfolio of admixtures, designed to address issues such as rheology and flow for concrete mixes, in addition to delivering excellent levels of quality and strength.

Dr. Zhong pointed out that, although sand and gravel are the most mined materials in the world, the global concrete industry is still susceptible to shortages in supply. "This issue is particularly relevant in Asia Pacific, where many countries are enjoying economic growth of approximately 5.6%, fuelled by ongoing infrastructure and commercial construction work.

"One popular way to cope with natural sand shortages is to partially or completely replace it with manufactured sand or quarry dust. However, the shape, grading and presence of clay in these aggregates have a negative effect on the quality of concrete produced. This can lead to poor workability, variances in performance and a loss of strength.

"To help mitigate the negative effects of poor-quality aggregates on concrete performance, ready-mix and aggregate producers are increasingly relying on concrete admixtures and clay mitigation additives such as the Clarena admixtures."

But that's not the only benefit of Clarena admixtures. The product is sustainable too, as it allows concrete producers to recycle returned concrete, revealed Dr. Zhong. "The Clarena admixture is simply mixed into the plastic concrete, turning it into a dry granular material, which can be used as



ABOVE AND BELOW: The Hong Kong-Zhuhai-Macao Bridge used several waterproofing systems from GCP Applied Technologies. One of them was the Eliminator waterproofing membrane (pictured below).



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partial replacement of virgin aggregates in concrete production. This application helps conserve natural resources and reduce CO<sub>2</sub> emission by reducing the transport of materials.

"For concrete producers, Clarena admixtures offer better flexibility in the choice of aggregate and sand materials used in a concrete mix, leading to both better consistency in quality and lower costs. By extension, this also reduces waste, enhancing the sustainability of individual production plants.

"Similarly, for quarry operators, using Clarena additives leads to less waste, increasing yield and productivity while simultaneously improving profitability."

Dr. Zhong continued, "GCP is constantly developing new technology to enable concrete producers to use fewer machines, less manual labour and more recycled or alternate materials.

"Looking ahead, GCP is working on a number of additives and technologies



To help mitigate the negative effects of poor-quality aggregates on concrete performance, ready-mix and aggregate producers are increasingly relying on concrete admixtures and clay mitigation additives such as the Clarena admixtures.

specifically aimed at improving sustainability, from solutions to maximise the full use of returned concrete to additives that help reduce carbon dioxide emission associated with concrete production and placement." ■

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



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# LiuGong goes electric



The unveiling of LiuGong BEVs in early September 2019, at the BICES exhibition.

LiuGong recently launched its battery electric vehicles (BEVs), remote-controlled intelligent wheel loader with the 5G technology, and sixth-generation excavators. The machines were presented at the BICES exhibition in Beijing, China.

The three new LiuGong BEVs include the 906E-EV and 922F-EV excavators and the 856HEV wheel loader. They utilise Lithium-ion battery systems for energy storage. This power is directed into permanent magnet electric motors that create the motion necessary to drive the machines. The mechanical and hydraulic systems of the machines have been optimised for high efficiency; a typical BEV will have a peak power output that is 2x a conventional diesel power machine, said LiuGong, enabling the BEV to accelerate faster and perform more coordinated movements.

The movements will also be more precise given the full electronic vehicle control, added LiuGong. Therefore, the BEV's productivity can be raised by more than 10% compared to that of a diesel machine.

"The total operating cost of a battery-powered earthmover is, or soon, will be depending on the exact vehicle design and customer application, lower than that of a diesel-powered machine," said Edward Wagner, executive director of LiuGong New Technology.

Being a high efficient, low cost, clean and renewable energy, electric energy is likely to replace fossil oils in the future, promoting the rapid development of global electrification. As a result, battery technologies have developed fast in terms of more energy and less cost, laying a solid foundation for the electrification of construction machinery.

The first generation of LiuGong BEVs' batteries are equipped with fast charging technology and energy-saving technologies, which only need one hour to charge the battery 80% to full and can maintain longer working hours.

The 906E-EV excavator is an example of how quickly and easily a diesel machine can be converted to battery electric, explained LiuGong. The machine utilises most of the diesel excavator's hydraulic system allowing for a rapid R&D time for conversion. It is fitted with a battery that is large enough for a full working day run time.

The 922F-EV excavator is purely driven by electric power. The large battery pack is located centrally at the rear of the machine for optimum mass balance. The electric motor and hydraulic system have been designed to maximise operator visibility.

A feature of the 856H-EV wheel loader is its pure electric driveline with regeneration, thus improving operating performance and reducing energy consumption. The hydraulic system is electrically driven while using off-the-shelf components. The 300+ kW peak power capability leads to a greater performance. The large battery pack is located at the rear of the machine to replace the conventional counterweight. The overall vehicle layout and packaging has been designed in such a way that enhances operator visibility.

According to LiuGong, its three BEVs feature a high degree of commonality of parts and systems across all of its new energy machines, making things simpler and lowering the total cost of ownership.

### 5G-based wheel loader

The new 5G-based, remote-controlled intelligent wheel loader from LiuGong has been co-developed and supported by China Telecom and Huawei technology. Cai Dengsheng, deputy chief engineer of LiuGong's Intelligent Technology Institution said the model can be remotely controlled from over 2,000 km away. The job can be done automatically by the intelligent system, while the operator only needs to press a button.

Under the remote-control driving mode, all operations can be observed from the videos that are sent back by the machines' cameras. It also uses an intelligent protection technology to create automatic identification and auto emergency stop. Thanks to this, the machine not only can be used in normal applications but also in dangerous and unsafe environments such as rescue and disaster relief, odorous or radiation environments.

LiuGong highlighted that 5G network is currently the most advanced network communication technology in the world, with only 30 millisecond data transition from Beijing to Liuzhou. Meanwhile, the transmission quality and stability are not influenced by either a complex environment or long transition time. At present, it is the best technical solution for timely, efficient and high-quality transmissions of large amounts of data. It provides a high-quality network environment and network technology support for LiuGong's remote control driving research, and offers a strong support for the combination of edge calculation and cloud computing in intelligent control under remote control conditions.



ABOVE AND BELOW: LiuGong's new intelligent wheel loader with the 5G technology can be remotely controlled from over 2,000 km away.



TOP, MIDDLE AND ABOVE: The three new LiuGong battery electric vehicles include (from top) the 856E-HV wheel loader, 906E-EV excavator and 922F-EV excavator. According to LiuGong, the productivity of these machines can be raised by more than 10% compared to that of a diesel machine.

### F-series excavators

The LiuGong F-series excavators integrate technology, intelligence and environmental protection to meet the future market needs. The company said these sixth-generation excavators are primarily designed for North America, Western Europe and China, while taking into account the emerging markets. Various product portfolios are provided to meet the needs of different markets.

Compared with the previous generations, the F-series offers more models and size classes, including standard ones for the Chinese market and those with short-tail and zero-tail swing for the Western European and North American markets. The machines comply with the latest emission regulations in China and Europe.

The F-series has 15 product sub-platforms with over 40 size classes ranging from 1.5 to 90 t, covering more than 90% of the global market demand, revealed LiuGong. Mini excavators of less than 6 t are divided into more size classes. A wide range of accessories are used to serve different applications, like excavation, demolition, forestry, material handling and recycling.

The new excavators are equipped with the latest electronically controlled hydraulic system, consisting of a main pump with large displacement, a low-speed and high-torque engine and a main electro-hydraulic proportional control valve for better management of flow distribution.

An intelligent cooling system is available as well, which controls the fan speed in real time based on the temperature of water, oil and intercooler. With these systems, the F-series can provide high operating efficiency and low oil consumption (about 15 to 20% lower than that of the previous generations, said LiuGong).

Furthermore, the F-series has been significantly improved in terms of product intelligence. It combines the integrated operation of a single excavator, intelligent control, network-based integration of excavators, intelligent monitoring, detection, prediction and remote control. The technology enables the monitoring of activities such as bucket trajectory, construction guidance, assisted excavation, automatic weighing, thus improving the working efficiency and quality and avoiding repeated operation. The excavators also adopt new electronic fence technology that ensures safer construction, and expandable control platform that provides the basis for access to the intelligent control and management system of excavators. ■

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



TOP, ABOVE AND LEFT: The sixth generation of LiuGong excavators, the F-series, offers a wide range of models and size classes. It has 15 product sub-platforms with over 40 size classes ranging from 1.5 to 90 t, covering more than 90% of the global market demand.



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# Protecting French motorway from corrosion

**W**ork on extending the A16 motorway in France started in 2017, which links L'Isle-Adam in the north of Paris and the Francilienne ring-road that runs around Paris. This upgrading project was aimed to provide simpler journeys, improve the flow of traffic, increase the level of safety on the roads and stimulate growth in the local economy.

The contractor on the project was commissioned to undertake a number of tasks, including the expansion of a structure and the integration of a slip road. Here, the Mapeshield I system was chosen to provide galvanic cathodic protection against corrosion in steel reinforcement of both new structures and structures being repaired.

After removing the old concrete from the parts of the structures damaged by corrosion, a total of 36 Mapeshield I anodes were installed along a 19.5 m stretch of the steel reinforcement that required protection. Each anode was fastened to the structure with metallic fasteners and placed at a pitch of 50 cm. The concrete was poured after checking the electrical continuity between the reinforcement and the anodes and making sure that enough space had been left under the anodes.

According to the contractor, the Mapeshield I system proved to be so effective and intuitive in terms of application, and it would be taken into consideration for work on the next jobsites with the same kind of problem.

## Galvanic cathodic protection against corrosion

The Mapeshield I system from Mapei features pure zinc anodes coated with a special conductive paste to provide galvanic cathodic protection. These anodes 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.

Upon connecting the Mapeshield I anodes 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.

The Mapeshield I anodes are available in two different lengths and four different masses, making the system suitable for various structures. The surface that the anode is capable of protecting



ABOVE: France's A16 motorway has been extended to link L'Isle-Adam in the north of Paris and the Francilienne ring-road that runs around Paris. In this project, Mapei anti-corrosion system with galvanic anodes was applied to protect new and existing steel reinforcement from corrosion.

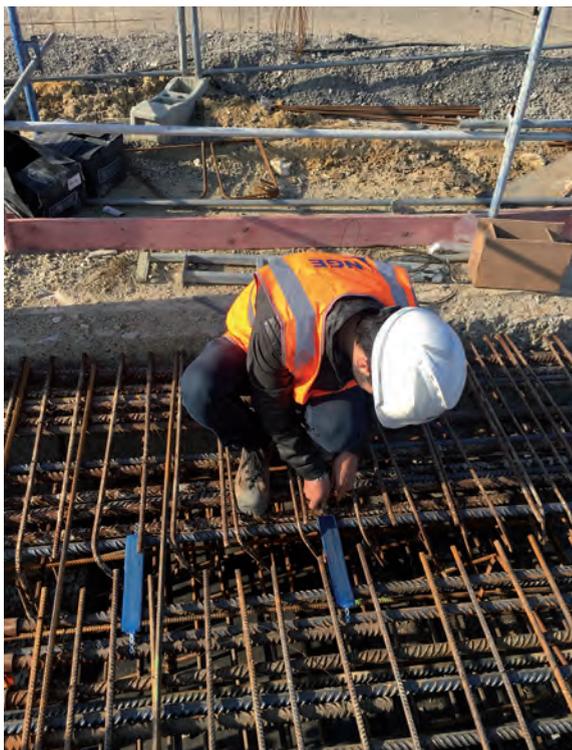
depends on its size (the bigger the anode, the larger the area it protects) while the mass, which is proportional to the amount of metal it contains, effects its duration.

The Mapeshield I system offers several advantages. It may be used as a preventative measure on new structures as well as on existing structures in need of repair. It can also be positioned strategically in specific areas where there is a higher risk of corrosion. What's more, the system does not require maintenance during its normal service life and it can be monitored while in operation by installing a simple control function.

Mapeshield I is compliant with the EN 12696 European standard 'Cathodic protection of steel in concrete'. The system is available globally, and it was recently introduced to the Asian market. ■

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

The article courtesy of Realta Mapei International no. 75



LEFT: The Mapeshield I anodes were installed along a 19.5 m stretch of the steel reinforcement that required protection. Each anode was fastened to the structure with metallic fasteners.

BELOW: The Mapeshield I anodes are coated with a special conductive paste to provide galvanic cathodic protection against corrosion.



LEFT: The anodes were placed at a pitch of 50 cm. The concrete was poured after checking the electrical continuity between the reinforcement and the anodes and making sure that enough space had been left under the anodes.



ABOVE: The Mapeshield I anodes are available in two different lengths and four different masses, making the system suitable for various structures.



# BUILDING BELLARY

A fleet of Volvo Construction Equipment (Volvo CE) machines - asphalt compactors, double drum compactors and a tracked sensor paver - is helping to improve the quality of roads and life in the city of Bellary, Karnataka, India.

“Tough, smooth roads generate more growth and vibrancy in the economy and definitely more smiles,” said P. Prabhakar Reddy, a public works contractor in the city of Bellary. “Better road qualities mean better quality of life and living - that’s the bottom line!”

Assisting the 30-year roadbuilding veteran on various projects are two Volvo DD100 asphalt compactors, four Volvo DD90 double drum compactors and a Volvo P5320B ABG tracked sensor paver.

“Our beginnings were humble, but our abiding passion for road building has ensured steady growth over the years,” said Mr Reddy.

The Volvo CE fleet has helped Mr Reddy on a string of prestigious projects including the 344-km NH-167 highway, which stretches from Hagaribommanahalli in Karnataka to Jadcherla in Telangana.



TOP AND ABOVE: The city of Bellary in Karnataka, India, is currently building many quality roads to improve the life of its residents. A number of Volvo CE machines, including several compactors and a tracked sensor paver, assist the contractor in completing these projects.

“It’s been a long and difficult journey but, at the end of the day, well worth it,” he said with a smile. “Real satisfaction in road building comes when you get that near-perfect mat finish across the entire project stretch. And that’s not easy to achieve!”

The Volvo P5320B ABG tracked sensor paver has been working on a road that connects to the new terminal at the Kempegowda International Airport in Bengaluru. “Building the road at the Kempegowda International Airport was another dream project - a big feather in our cap,” delighted Mr Reddy. “I am happy to report that the P5320B ABG Volvo tracked sensor paver is doing its job on time.”

Mr Reddy further highlighted that the P5320B ABG tracked sensor paver allows for an excellent paving quality and hassle-free operations, and is easy to operate - the latter of which is a definite advantage in his business where there is constant pressure on both margins and availability of skilled manpower.

Mr Reddy purchased his fleet of Volvo CE machines from Bengaluru-



The Volvo P5320B ABG tracked sensor paver has been working on a road that connects to the new terminal at the Kempegowda International Airport in Bengaluru.

based Encore Heavy Machinery Pvt Ltd, Volvo CE’s distribution partner in the state of Karnataka. “Maintenance and service are no issues, thanks to them,” he said. “Encore Heavy Machinery helps us

ensure maximum machine uptime.” As for the future, Mr Reddy has an ambitious roadmap that envisions new roads in new areas. ■

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

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# THE ROAD TO QATAR

**W**ith both the National Vision 2030 and the FIFA World Cup 2022, Qatar has to ensure its national infrastructure is delivered. Furthermore, to showcase itself as a sustainable and technologically advanced nation as well as to prepare for the World Cup, all projects are virtually on a strict timetable.

When dealing with simultaneous infrastructure development on such a massive scale, the issue of traffic congestion can often lead to significant delays across multiple projects, potentially hindering essential deadlines and making the daily lives of commuters a living nightmare. To solve this problem, Ashghal (Public Works Authority) came up with the solution of building a new orbital highway and truck route that would circumvent the capital Doha, allowing construction equipment, personnel and material to reach their various sites directly, reducing disruption for Qatar's citizens and residents.



Construction of the new orbital highway and truck route in Qatar involved connecting the Salwa Road to the North Relief Road with 47 km of highway, including five dual lanes for light vehicles, two dual lanes for heavy goods and industrial vehicles, six viaducts, 17 bridges and underpasses.



Construction work on the project started in May 2014, with the contract awarded to a joint venture (JV) between QDVC and Bin Omran Trading & Contracting Company. The scope of the project involved connecting the Salwa Road to the North Relief Road with 47 km of highway, including five dual lanes for light vehicles, two dual lanes for heavy goods and industrial vehicles, six viaducts, 17 bridges and underpasses. To meet the delivery date scheduled for 2018, the success of the project would require the exclusive involvement of companies that could work fast without cutting corners.

#### Formwork solution

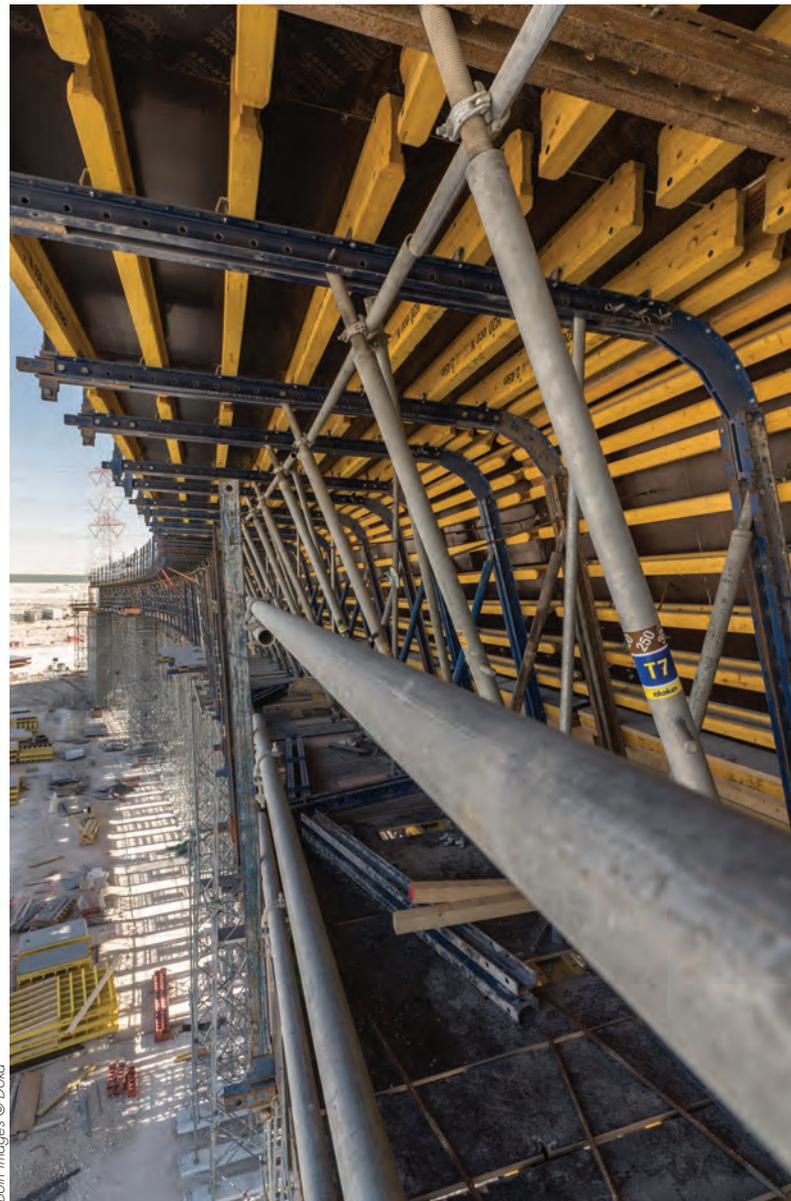
Doka's systems were selected to help build major bridges and viaducts. The company was faced with a tight delivery window, meaning a preassembly strategy would be essential. This comprised the special electric stripping devices for bridge deck formwork, HEB1000 steel beam grill, and special steel parts such as adjustable plates and special fixing collars for the piers.

Using a series of combinations like Staxo 100 eco with steel profiles, Top 50, D3 and SL-1 HD shoring, Doka had to create



innovative shoring configurations and panels. This was one of the reasons why the engineering hours on the project exceeded 20,000 hours, including supervision on site, said Doka.

Fulfilling the project's safety requirements, Doka was involved in the project right from the beginning. During the preparation phase, the company calibrated a number of elements carefully such as the shoring erection sequence, weight to be carried, integrated safety equipment on the material, access to the work area and dismantling sequences, thereby providing a safe, productive and



Both images © Doka

**LEFT:** Formwork manufacturer Doka was involved in the project helping to build several bridges and viaducts. Here, the company's Top 50 large-area formwork and Staxo 100 eco load-bearing tower were used in shaping bridges 6A, 6B and 6C of Junction 6, while its ready-to-use service (RTU) was utilised to form the bridges' cantilever decking and siding.

**ABOVE:** The cantilever decking and siding of bridges 6A, 6B and 6C of Junction 6.

cost-efficient solution to complete the job. Some of the value-added elements used by Doka consisted of 3D modelling, screw jack extensions for each shoring towers made with AutoLISP, and wood boxes cut by CNC machine.

Baptiste Ravoire, methods manager for the JV commented, "Doka Qatar's design team were both highly professional and flexible to our requirements. We thoroughly appreciate the team's technical skills and its ability to solve different challenges encountered on the project. This project is particularly complex with tight contractual constraints, and thanks to the support of Doka, we've been able to meet these requirements and ensure the intermediate milestones were met on time." ■

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

# Concrete industry players to gather in Las Vegas

The next World of Concrete (WOC) will take place once again at the Las Vegas Convention Centre, Nevada, USA, from 4 to 7 February 2020 (education from 3 to 7 February). This annual international trade show will offer all the new products, major suppliers, resources and valuable information for the concrete and masonry industry.

The show organisers are anticipating another successful event, as the last WOC in 2019 was the largest edition in 10 years, with 60,000+ registered professionals and over 1,500 leading-industry suppliers exhibiting across more than 750,000 net square feet (about 69,677 sq m) of space.

The WOC education programme provides 180+ sessions, interactive workshops, certifications, seminars, train-the-trainer, and hands-on & industry training to build technical skills and business know-how.

New for 2020 is Zero Emission Live!, powered by Wacker Neuson. It will feature equipment with which contractors can perform common construction tasks in a safe, quiet and emission-free zone. There will be demonstrations of products and techniques with safety and productivity in mind. All presentations and demonstrations will be educational in nature.

WOC will be participating in the 2020 Trade Events Partnership Programme (formerly the IBP). As a member of the 2020 IBP, WOC show management and the US Commercial Service will work closely in the global promotion of the 2020 show to bring international buyers and US exhibitors together to expand business both domestically and overseas.

WOC welcomes international delegations to the show and makes every effort to assist those interested in recruiting and







ALL IMAGES: Scenes from  
World of Concrete 2019.

organising a group of 15 or more to attend the show. Delegations are organised by country through the US Commercial Service International Posts.

### A variety of sections

The Producer Centre (North Hall) features marketplace of materials, equipment, demos and seminars for concrete producers. The Technology for Construction (North Hall) showcases the latest products and tools for the commercial construction industry from top information technology and systems providers.

The Precast (North Hall) offers new products and technologies in the precast/prestressed sector. The Concrete Masonry (North Hall) has everything for the producers of concrete masonry such as block, segmental retaining wall units, veneer, slabs, pavers, and roof tiles, admixtures, equipment & supplies and pigments.

The Concrete Reinforcement (North Hall) provides the leaders in concrete reinforcement showcasing reinforcement bending, cutting, straightening and fabricating machinery, reinforced positioners and locators, epoxy-coated, steel, glass fibre, galvanised bar and all types of reinforcement accessories.

The Masonry (Central Hall) exhibits products, tools, information and technology for masonry professionals. The Material Handling (Central Hall) offers trucks, excavators and more for material delivery, distribution, concrete placement and earthmoving.

The Concrete Repair & Demolition (South Hall) features a

display of the latest surface preparation equipment, scarifying, grinding, sawing equipment, sealants, joint fillers and others. The Concrete Surfaces & Decorative (South Hall) showcases surface protection products, coatings, cleaning solutions, stains, pigments and moulds, to name a few.

In addition, Stucco Live! will take place this year at the Central Hall, where visitors will be able to interact with instructors, product experts and designers to learn the most current trends in stucco applications. The event is sponsored by the Stucco Manufacturers Association (SMA). SMA members and affiliated associations will also introduce new products and assemblies that meet current energy code standards and high-performance trends.

### More activities

At the Silver Lots 1 & 2, front of Central Hall / Silver Lot 3, and front of South Hall, there will be a variety of exhibiting suppliers, live demos, heavy equipment, decorative concrete products, Decorative Concrete Live!, WOC Official Licensed Merchandise, and more.

The Bronze Lot, next to South Hall, will see exciting championships, skills challenges, creative demos, and events including Spec Mix Bricklayer 500 World Championship, The John Deere Operator Challenge, Western Star Trucks Get Tough Challenge, MCAA spectator events, and new events for 2020 such as the Mahindra Roxor Mission: Ready Challenge, among others. ■

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

The following pages cover some of the exhibitors and their products that will be presented at the World of Concrete 2020.

## WIRTGEN

**BOOTH: C5426 & B51404**

Some highlights at the Wirtgen booth will include the company's inset concrete paving train, consisting of the two machines being unveiled at the show – the WPS 62i placer/spreader and the SP 124i slipform paver – as well as the TCM 180i texture curing machine. The small SP 25i and SP 15i concrete pavers rounding out the range of inset and offset solutions will also be presented. Plus, the Autopilot 2.0 3D control system – a North American debut as well – will be demonstrated live in the outdoor area.

Wirtgen's new WPS 62i placer/spreader features two track units. For preplaced reinforcing steel, the concrete must be supplied from the side. The WPS 62i/WPS 62 is suitable for such an application. As the first machine in the Wirtgen paving train, the placer/spreader passes over the reinforcement in front of the slipform paver while the concrete is fed from the side and distributed evenly over the entire working width (between 3.65 m and 7.3 m in the case of the WPS 62i/WPS 62, and a paving thickness of up to 500 mm).

Due to the fully modular machine design with standard hydraulic quick-change couplings, the WPS 62i/WPS 62 can be easily reconfigured and quickly prepared for the respective jobsite situation or for transport, which also increases the machine's uptime.

The Wirtgen SP 124i/SP 124 slipform paver has a working width of up to 12 m, equipped with four steerable and slewing crawler units. It is also available with an optional new hydraulic rotational drive system with a steering angle of up to 260 degrees. The additional manoeuvrability of the machine allows the operator to quickly and flexibly adapt to the conditions on the jobsite. The machine's narrow profile and reduced track line also allow the operator to pave close to obstacles.

The four crawler units of the SP 124i/SP 124 can be switched to rotation mode at the push of a button. As a result, the machine can turn almost on the spot and directly produce the next lane in the opposite direction without wasting any time on repositioning. For transport, the swing legs are hydraulically swung in, further optimising the transition from paving and decreasing downtime.

As the third machine in the Wirtgen paving train, self-propelled texture curing machines such as the TCM 180i/TCM 180 guarantee the success of professional curing of concrete pavements. It is fitted with an automatic spraying and brooming system and directly follows behind the slipform paver to create the desired surface texture. Finally, the spraying system applies a dispersion to the fresh concrete surface, thus preventing it from drying out prematurely. The modular design of the TCM 180i/TCM 180 supports working widths between 4 m and 18 m.

In addition, with its newly developed AutoPilot 2.0, Wirtgen continues to be synonymous with quality and precision in concrete paving. The 3D control system can now create as many offset and inset profiles as required even more cost-effectively and precisely. In doing so, the system either uses an existing data model or creates a new digital data model on site, thereby eliminating the need for a surveyor to create a geodetic data model in advance. It also eliminates the time-consuming measuring, mounting and removal of stringlines, making the entire operation faster and more cost-effective. Wirtgen offers the AutoPilot 2.0 for the SP 15/SP 15i and SP 25/SP 25i models. The company said it is also possible to upgrade machines with the new system. ■

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



Wirtgen WPS 62i placer/spreader.

## ANMOPYC

**BOOTH: C4248**

Anmopyc, the Spanish Manufacturers Association of Construction and Mining Equipment, will once again participate at the World of Concrete. The association represents about 100 companies, which manufacture machinery and equipment in various sectors, including concrete and mortar; lifting and transport; aggregates, mining and recycling; road, earthmoving, underground and drilling; temporary works; auxiliary equipment; and components and spare parts. Anmopyc's main objective is to promote internationalisation strategies, quality and security, and technological innovations of its members in order to be more competitive worldwide. ■

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



## NORSEMAN

**BOOTH: S13316**

The Aero Airstream from Norseman is the company's signature A/C and ventilation duct. It uses an advanced woven coated polyethylene (PE) fabric for high durability. The woven scrim creates a tighter bond between the fibres of the fabric providing superior tear resistance. If the PE gets torn or punctured, the fabric creates a micro barrier that prevents the tear from growing, and minimises its impact.

The Aero Airstream has also been engineered to maintain a lower energy coefficient, allowing for a steadier and more even air flow. The fabric's coating gives the duct a waxier finish, keeping air flowing through at a maximum rate.

Norseman pointed out that, as PE fabric is resistant to harsh UV rays, the Aero Airstream will stay white and bright even



FAR LEFT AND LEFT: The Aero Airstream A/C and ventilation duct.

after days on site with increased exposure to sunlight. Its waxy finish also means users can easily pressure wash or clean the duct to keep it looking new and professional.

The Aero Airstream can be customised with either belted cuff and/or wire ring collar

on each end, depending on the customer needs. Furthermore, compression straps have been attached to the Aero Airstream, which makes it easier to pack up and minimises storage space. ■

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

## PRECO ELECTRONICS

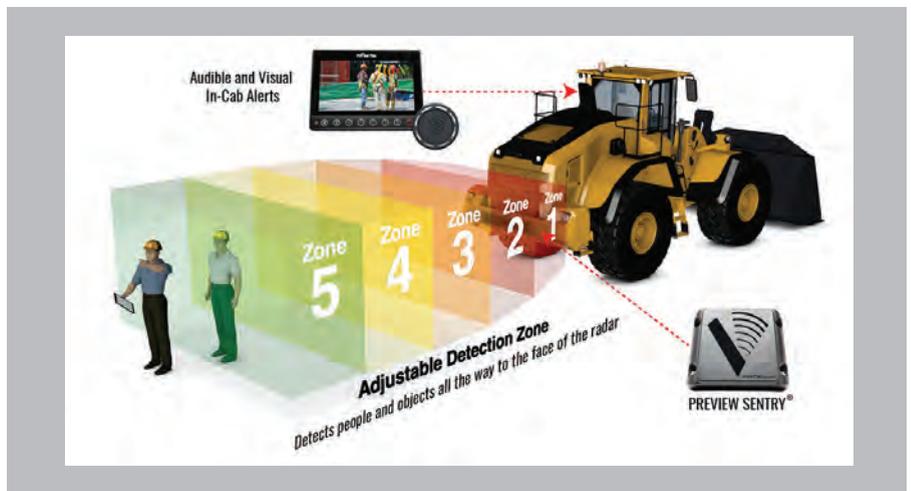
**BOOTH: C6781**

PRECO Electronics will offer its collision avoidance radar system, PreView Sentry, which eliminates operators' rear blind spots and creates safer and more efficient jobsites.

The Sentry is a small, rugged, short/medium range radar sensor for use in heavy-duty applications. Designed for rear collision detection, it incorporates a fully adjustable detection zone, with the ability to detect objects from the face of the radar up to 30 m. The width of the detection zone is also adjustable to fit nearly every vehicle type. When combined, PreView products provide operators with a complete understanding of their surrounding environment, potential threats and the ability to proactively take action to reduce the number and severity of collisions.

Transmitting and receiving low power 24 GHz radar signals, the radar then processes the returned signals to determine if an object has reflected any energy back to the sensor and reports this to the operator display within 240 ms, allowing the operator to quickly respond to any object within the detection zone.

Using frequency modulated continuous wave (FMCW), the Sentry measures radial range, speed and angle, reflectivity, and other parameters of multiple stationary



ABOVE: Designed for rear collision detection, PreView Sentry incorporates a fully adjustable detection zone, with the ability to detect objects from the face of the radar up to 30 m.

BELOW RIGHT: The PreView Sentry radar sensor is suitable for heavy-duty applications.

and moving targets simultaneously. This radar sensor has a wide horizontal field of view up to +/- 75° (150°), providing coverage flexibility to be a solution for virtually any application.

PRECO said that all of its radar solutions are highly configurable and flexible, and can be tailored to equipment without the need for numerous monitors, greatly enhancing the safety of operations. ■

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



## SUCOOT

**BOOTH: C3314**

Sucoot is a global manufacturer of scaffolding and formwork equipment. The company has developed its products with safety and productivity in mind, such as its ring system scaffold and system formwork, aimed to optimise the construction process resulting in time- and cost-savings. Apart from offering its ring system scaffold, system formwork, scaffold and formwork accessories, Sucoot also provides pre-3D design and on-site supervision services.

According to Sucoot, its ring system scaffold meets the strict European standard EN-12810 as well as other international regulations such as ANSI 10.8. The company said its scaffolding equipment is also regularly sent to undergo the test of bear capacity by SGS official laboratory Cheng Kung University, Taiwan and Yunlin University of Science and Technology, Taiwan.

Sucoot has been involved in a wide range of construction projects around the world, including the Taipei MRT circular line rail bridge, Taiwan; Taoyuan MRT CE-02, 03 rail bridge, Taiwan; Bangkok Suvarnabhumi International Airport terminals, Thailand; Thai Airways Airbus-A380 maintenance project, Thailand; Indonesia's bridge pylon shoring project; Chongqing China H: 37M bridge shoring project; Kaohsiung City Music Hall, Taiwan; and Taiwan high-speed rail project, among others.

Established in 1984, Sucoot started as a formwork complementary accessories supplier. Over the years, the company has grown into a leading brand in the scaffold and formwork industry in Taiwan. Today, Sucoot has customers in more than 65 countries and the company keeps expanding its markets. ■

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



RIGHT: Sucoot will showcase its various scaffolding and formwork equipment.

## DU-LITE

**BOOTH: G7386**

Du-Lite's Dri-Air Lube System is custom-built portable air manifold that removes water from the compressor air supply lines and has the option to add lubricating oil to the clean air, coating internal parts of air tools with oil to prevent rusting and breakages.

Air compressors force-feed large quantities of air into very small spaces. This compression process creates heated compressed air that contains moisture. As the compressed air travels through the air supply lines, it cools and water droplets are allowed to form. When this air/water mixture enters the Du-Lite Dri-Air Lube System, the air is forced to travel through a baffle. And as this mixture travels through the baffle, the water is displaced and falls to the bottom of the Dri-Air Lube System. When enough water and dirt has been collected, it semi-automatically ejects to the ground or an available drain. Users then

have the option to have the clean dry air travel directly to their machine, or have the dry air enter the lubricator and mixes with Du-Lite's variety of rust preventative oils, and is sent through to the air tool.

According to Du-Lite, an element filter is the only part needed to maintain its Dri-Air Lube System. The lubricator only needs oil added to the reservoir as necessary.

Du-Lite manufactures four different air-tool lubricants. The frost-free air tool lubricant, DBE (directional boring equipment oil) lubricant, and premium rock drill oil (offered in winter and summer blend) are all non-toxic, environment-friendly and biodegradable. They help to prevent tools that run on air from rusting internally, even up to 12 months in storage. The New-Matic air tool lubricant prevents up to 80% of part breakage and stoppage due to water vapour and corrosion, since it provides long-lasting lubrication to any



LEFT AND BELOW: The Dri-Air Lube System.



air driven equipment. Du-Lite said that this lubricant can continue working even when the equipment is in storage – up to 12 months. ■

Website: [www.du-lite.com](http://www.du-lite.com)

## MBW

**BOOTH: C4004**

The MBW concrete slipform pavers are designed for high productivity, reliability and ease of maintenance. They are available in two models and three different styles. Their curb profiles can range up to 18-in high (about 46 cm) and up to 48-in wide (about 122 cm). Each width hopper can only be used with a mould of equal or slightly smaller size, which MBW can help determine.

All MBW pavers weigh less than 5,000 lbs (2,268 kg) and can be easily driven onto a trailer and pulled with a pickup truck. They are capable of manual or automatic operations and have the ability to perform tight radii. ■

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



RIGHT: MBW concrete slipform pavers are available in two models and three different styles.

## CIRCSAW TECHNOLOGIES

**BOOTH: C3509**

CircSaw Technologies will be showcasing its new SkatePlate line that has just been launched. The products aim to create a new standard on how professionals and DIYers use circular saws.

The SkatePlate Combo Pack is a detachable rolling plate and adjustable rolling rip fence that transforms a circular saw into a portable table saw. The plate is designed for high durability and is made from glass-filled high-impact nylon. The rollers are polyurethane with Delrin bearings. Among the benefits include faster precision cuts with greater control and accuracy. It removes the need for chalk lines, glides over surfaces and eliminates scratching. It also saves time by measuring once and making multiple identical cuts.

The SkatePlate is excellent for rip and notch cuts, framing and finish carpentry and a wide range of custom cuts. According to CircSaw Technologies, the SkatePlate fits over 95% of the most popular 7-1/4-in (185 mm) Sidewinder (right blade) and Wormdrive (left blade) circular saw sold in the world.

The SkatePlate H2O is an accessory to the SkatePlate that converts a circular saw into a portable water saw. It is ideal for cutting cement, concrete, masonry, marble, granite and tile. Its benefits include cleaner, straighter control joints while cooling the blade and extending



LEFT: The new SkatePlate product line aims to create a new standard on how professionals and DIYers use circular saws.

BELOW: The SkatePlate H2O is an accessory to the SkatePlate that converts a circular saw into a portable water saw, featuring an adjustable articulating spray hose.

blade life. The kit significantly reduces caustic dust and turns a two-person job into a one-person job.

The SkatePlate H2O features an easily adjustable articulating spray hose to direct at the point of cut with a 15-degree fanned spray and incorporates an outdoor-rated GFCI. The kit fits both versions of the SkatePlate.

The SkateGuide-Zilla is an accessory to the SkatePlate and is a giant rolling rip fence that supports precision cuts up to 24 in (about 610 mm). It requires two-handed operation, which improves stability, control and safety. The smooth gliding action and adjustable guide allows for repeatable and accurate wide cuts. The SkateGuide-Zilla is excellent for cutting plywood sheets, flooring and a wide range



of horizontal and vertical cuts. It fits both versions of the SkatePlate.

CircSaw Technologies' SkatePlate & SkateGuide Combo Pack and the SkatePlate H2O have recently won the 2019 Pro Tool Innovation Awards. ■

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

# MAKINEX

**BOOTH: S13519**

Makinex's heavy-duty industrial floor stripper is suitable for contractors, rental companies and renovators. It is designed to remove materials such as vinyl and glued carpet, featuring an easy tool-free setup, quiet operation and minimal maintenance.

The floor stripper offers a 1,735 oscillation per minute and comes with a 110 V electric motor. The machine measures 917 mm long, 366 mm wide and 896 mm high, fitted with an adjustable sliding handle height to suit any users. It has a total weight of 64 kg, with a removable weight of 16 kg.

In addition, Makinex offers the MS100 mixing station for self-levelling cements, compounds and epoxies. Equipped with a motor, the unit can handle up to 4 - 50 lbs (about 1.8 - 22.7 kg) bags per batch. It has a quick-release universal mixer attachment, and its sealed casters keep the wheels rolling smoothly. This 18-kg mixing station with a 120 V motor is available with 150-300 rpm and 300-650 rpm. ■

*Website: [www.makinex.com](http://www.makinex.com)*



ABOVE: Makinex floor stripper.

LEFT AND BELOW: Makinex MS100 mixing station with motor.



# KRYTON

**BOOTH: S12145**

Kryton International offers an innovative concrete waterproofing solution, Krystol Internal Membrane (KIM). This hydrophilic crystalline admixture is included with the concrete mix at batching plant or directly to the ready-mix truck.

KIM adds durability and longevity to concrete by protecting it against chemical attack and corrosion without costly materials, labour or time required to install traditional external methods. The system is used in place of surface-applied waterproofing membranes.

According to Kryton, surface-applied membranes or sheet membranes and fluid-applied membranes can stop water from penetrating the surface but have limitations and are at risk of puncture damage and failure. Thus, a more successful strategy is to replace external membranes with an internal one.

KIM controls corrosion in reinforced concrete by impeding the development of corrosive conditions caused by moisture penetration. The result is a structure with increased durability, a longer lifespan and lower maintenance costs over the structure's service life – which is essential for today's sustainable building practices. ■

*Website: [www.kryton.com](http://www.kryton.com)*



LEFT AND BELOW: Krystol Internal Membrane (KIM) is included with the concrete mix at batching plant or directly to the ready-mix truck.



LEFT: KIM is a hydrophilic crystalline admixture that adds durability and longevity to concrete by protecting it against chemical attack and corrosion.

## POWER PUSHER

**BOOTH: S12651**

Power Pusher's E-750 electric wheelbarrow can safely and easily transport loads weighing up to 1,000 pounds (about 453.6 kg), improving safety and efficiency by eliminating ergonomic challenges and production delays associated with manual wheelbarrows. Available with multiple tubs, including the slurry tub with concrete funnel cap, galvanised steel tub and heavy-duty poly tub, the E-750 is suitable for construction, demolition, landscaping and many other applications.

Designed to minimise strain, the E-750 electric wheelbarrow provides push-button powered dump capability. The unit moves at speeds reaching 4 miles per hour (about 6.4 km/hr) - it is said to be much faster than standard wheelbarrows. And its silent motor with zero emissions is excellent for indoor or outdoor use fitting through standard doors. The quick-change system is also a favourable feature of the E-750.

The wheelbarrow's slurry tub with concrete funnel cap is developed specifically for hauling and unloading concrete. The galvanised steel tub is perfect for demolition, while the heavy-duty poly tub is ideal for material hauling and dumping.

The E-750's attachments also include flatbed, available in short (38 in / 0.96 m) and long (48 in / 1.2 m) sizes, allowing it to move any type of load; ball hitch to tow trailers, machines, vehicles and more; dolly transport bed, which lifts and transports large, bulky items; and tree boulder dolly, intended for construction and landscaping work. Custom attachments are available as well. ■



The E-750 electric wheelbarrow with steel tub.

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

## AINA WIRELESS

**BOOTH: N1266**

AINA Wireless provides broadband Push-To-Talk (PTT) solutions, including PTT applications and handheld devices, aimed to increase efficiency in critical communication, productivity and safety. By combining grown user habits of walkie-talkie radio users with LTE/IoT technology, AINA offers radio 2.0.

With AINA's handheld PTT devices, users can stay connected with their colleagues. The PTT Voice Responder is a next generation Bluetooth speaker-microphone that can remotely control functions such as push-to-talk, channel switching and emergency alerts. The design of the device focuses on the users' needs and safety, thanks to its durability and reliability.

In the construction or transportation industry, The AINA PTT Voice Responder is ideal for in-vehicle and around-vehicle use, connecting wirelessly via Bluetooth to smartphones and tablets while continuously charging via the dash-mounted AINA Vehicle Cradle. In addition, the cradle keeps the PTT Voice Responder's within easy reach and safe



FAR LEFT: In the construction or transportation industry, the AINA PTT Voice Responder is ideal for in-vehicle and around-vehicle use.

LEFT: The AINA Talk PTT application allows users to reach hundreds of other people with a single press of a button.

from heavy vibrations and accidental drops in-cab. Together with Command Alkon's or Trimble's fleet management solutions for example, the AINA PTT Voice Responder and Vehicle Cradle are an optimal solution.

The AINA Talk PTT application allows users to reach hundreds of other people

with a single press of a button. In case of an emergency or distress situations, AINA Talk also offers emergency call and location tracking features, which are designed to keep the user safe and in reach of help at all times. ■

Website: [www.aina-wireless.com](http://www.aina-wireless.com)

## WERKMASTER

**BOOTH: S12126**

Canadian manufacturer WerkMaster will display its floor finishing solutions. Among them is Gator, a new hardwood floor refinishing, polishing and prep machine. Its low-profile handheld design can get under 8.8 cm kicks and edge to within 3 mm of the wall.

WerkMaster's other machines, such as Scarab, 14-in Edge, 17-in Cobra, 20-in Titan XT and 28-in Colossos XT, are all suitable for grinding and polishing residential, commercial, institutional and industrial projects.

The company will also be showing its 14-in Rasp and 17-in Razor machines, designed for the hardwood flooring market, as well as its 14-in Miroir and 17-in Python machines for terrazzo and stone.

All of WerkMaster machines have been built to be user-friendly and easy to operate. Their notable features include a multi-head design and dual-phase auto sensing VFD. Depending on the model, WerkMaster machines are available in 110 V / 220 V, 220 V, 230V / 460 V single phase / three phase power and propane models. The power source can be adapted to the jobsite needs using the Breakout Box and Quad Box.



LEFT AND BELOW: WerkMaster provides a wide range of floor finishing solutions for the global market.

In addition, WerkMaster provides high-quality tooling, especially with the introduction of natural diamond tooling for hard concrete. The company has developed a tooling guide for each machine to optimise the grinding and polishing process.

WerkMaster will exhibit its full range of chemical products as well. The Ultra series of densifiers, sealers and cleaners are high-performance solutions designed to improve the durability, wear resistance and produce a high-quality finish on polished floors.

Founded in 2005, WerkMaster is based in Burnaby, British Columbia. Apart from product manufacturing, the company also offers certified polished concrete training schools both on-site and off-site. ■

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



## BIDDING ENTERPRISE

**BOOTH: N1551**

Bidding Enterprise is a professional concrete estimating needs, which offers detailed quantity takeoffs and accurate cost estimates for bidding purposes. It also assists contractors with their project scheduling needs.

According to Bidding Enterprise, some contractors already have in-house pre-construction and estimating teams or they

prepare the bids themselves, but in order to bid accurately they sometimes refer to Bidding Enterprise for a second opinion. Other times due to the current workload on the in-house estimating team, the estimating job would be outsourced to Bidding Enterprise.

Bidding Enterprise employs a combination of industry experts, carefully

designed quality assurance processes and on-screen IT solutions for preparing the takeoffs that are precise and accurate. Using detailed and meticulously prepared checklists and by exercising two-stage peer quality reviews, the company aims to deliver quantity takeoffs with concrete contractors' requirements in mind. ■

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



FAR LEFT AND LEFT: Bidding Enterprise is a professional concrete estimating needs, which offers detailed quantity takeoffs and accurate cost estimates for bidding purposes.

# CORTEC CORPORATION

**BOOTH: S12050**

Cortec Corporation will present its line of Migrating Corrosion Inhibitor (MCI) technology for post-tensioning (PT) applications. These solutions form a protective corrosion inhibiting layer on metal surfaces such as rebar and PT cables. Their effectiveness, convenience, and low environmental impact make them suitable for corrosion protection in concrete construction applications.

The MCI-309 is a user-friendly corrosion inhibitor option to protect bridge PT tendons from corrosion before grouting. This is especially important during construction delays, such as those in cold winter climates where grouting must be postponed until the weather gets warmer.

The MCI-309 comes in powder form and is easy to fog through PT ducts using a low-pressure air hose and sandblast cup. The inhibitor migrates through the duct space and forms a molecular layer on the metal PT strands for up to 24 months of continuous corrosion protection. According to Cortec, little or no surface preparation is required, and the MCI does not need to be flushed out of the systems before grouting.

The MCI Mini Grenades can be added to grouting materials for additional corrosion protection after grouting. They are small water-soluble pouches full of MCIs that dissolve when they are mixed into concrete repair mortars or grouts. The MCIs disperse throughout the mix and, when applied, migrate towards nearby PT strands and rebar to provide corrosion protection.

The MCI CorShield is a water-based corrosion inhibitor coating for protecting loads of rebar lying in open storage at the construction site. The product leaves a



MCI-309 is easy to apply to PT ducts and does not need to be flushed out before grouting.

clear coat that cures to a soft non-tacky film and eventually hardens. The MCI CorShield does not need to be removed prior to embedding rebar in concrete, said Cortec. Depending on conditions, this solution is recommended for up to five years of indoor protection and 6-24 months of unsheltered outdoor protection.

The PTC Emitters are an efficient dry method of protecting metals, such as PT cables, within an enclosed space. They were developed more than 10 years ago to fight corrosion in the suspension cables of the Severn bridge to make up for deficiencies and shutdown periods of the bridge's dehumidification system.



PTC Emitters are an efficient dry method of corrosion protection for metals, such as PT cables, in void spaces.



MCI Mini Grenades are a convenient way to add corrosion protection to grout or repair mortars.

The PTC Emitters contain MCIs that vaporise out of the breathable pouch material and migrate throughout the enclosed void, forming a self-replenishing protective layer on all exposed ferrous and non-ferrous metals in recessed areas, interior cavities, and voids. Protected surfaces do not have to be cleaned prior to concrete or grout placement, and PTC Emitters do not affect physical properties of concrete or grout (e.g., set time, strengths, etc.). Cortec said they are good for any enclosed void areas in bridges or other structures where exposed metals need protection. ■

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

# AMERICAN TIME AND LABOR COMPANY

**BOOTH: N1656**

The Pacific Timecard Application from American Time and Labor Company is a robust mobile time and attendance application with GPS tracking, designed for managing construction companies' off-site field workers. By leveraging this technology and platform, the application allows mobile workers to document in real time such things as time worked, activities, job costing, mobile forms, lunch periods, rest breaks, mileage and GPS location.

Pacific Timecard also has features like team clock in/out (designed for construction crews), photo capture and digital signature signoff, GPS location, over 35 real-time reports and seamless integration from punch to payroll). This gives employers a real birds-eye view on their mobile workers and real time information needed to run any business more efficiently. All data is held in a secured cloud-based environment provided by Amazon Web Services (AWS). ■

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



The Pacific Timecard Application.



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# DOOSAN

**BOOTH: C5577**

The Doosan DX42-5 is a conventional tail swing mini excavator in the 4- to 5-t class. Thanks to its relatively narrow width, operators can easily navigate through doorways, gates and other obstacles.

The machine has an enclosed cab with heat and air conditioning and offers an optional open canopy configuration. Both features allow for excellent all-around visibility, especially to the excavator's attachment. A standard suspension seat provides all-day operator comfort, while a strategically positioned deluxe instrument panel provides valuable machine information. A standard keyless start system helps to reduce unauthorised machine use and theft on jobsites.

In addition, DX42-5 owners can choose a standard arm or a long-arm option. The long-arm option gives operators more dig depth and reach and reduces the amount of machine repositioning for enhanced productivity.

A blade comes standard with the DX42-5, and an angle blade is available as a factory option for enhanced backfilling and creating swales. The mini excavator can also be equipped with a quick coupler, bucket and thumb attachment package.

The DX42-5 is powered by a 42.7 hp diesel engine (Tier 4 compliant). The machine has an operating weight of 4.33 t, bucket digging force of 4.17 t and maximum digging depth of 3,205 mm.

The Doosan DL200-5 wheel loader is designed for digging, heavy lifting and general construction tasks. It has a Z-bar lift-arm linkage system that provides more power, breakout force and reach for digging and loading high-sided trucks.

The DL200-5 features a hydrostatic transmission, giving operators more power, enhanced fuel efficiency and better precision while working. The 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, said Doosan.

The operators can also 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 DL200-5 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 wheel loader is powered by a 142 hp engine, and offers an operating weight of 11.7 t and bucket capacity of 2 cu m. Its dump height at 45° (fully raised) is 2,760 mm.



Doosan DX42-5 mini excavator (above) and DL200-5 wheel loader.



The DL200-5 is available in high-lift Z-bar configuration for additional dumping height. Approved attachments for the machine include general purpose, light material and multi-purpose buckets; pallet fork; and quick coupler. ■

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

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