

SOUTHEAST • ASIA CONSTRUCTION

JANUARY - FEBRUARY 2020

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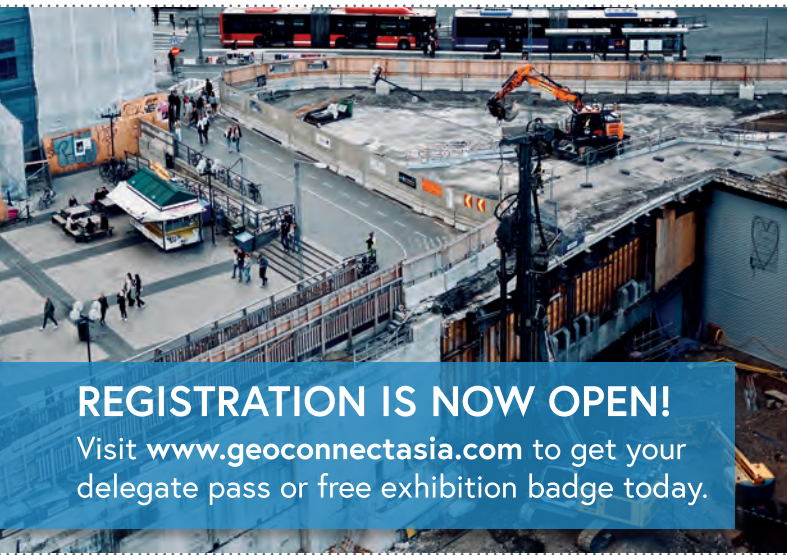
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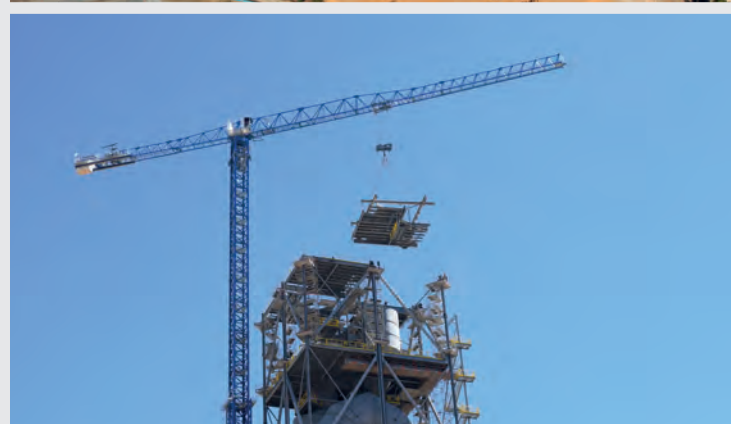


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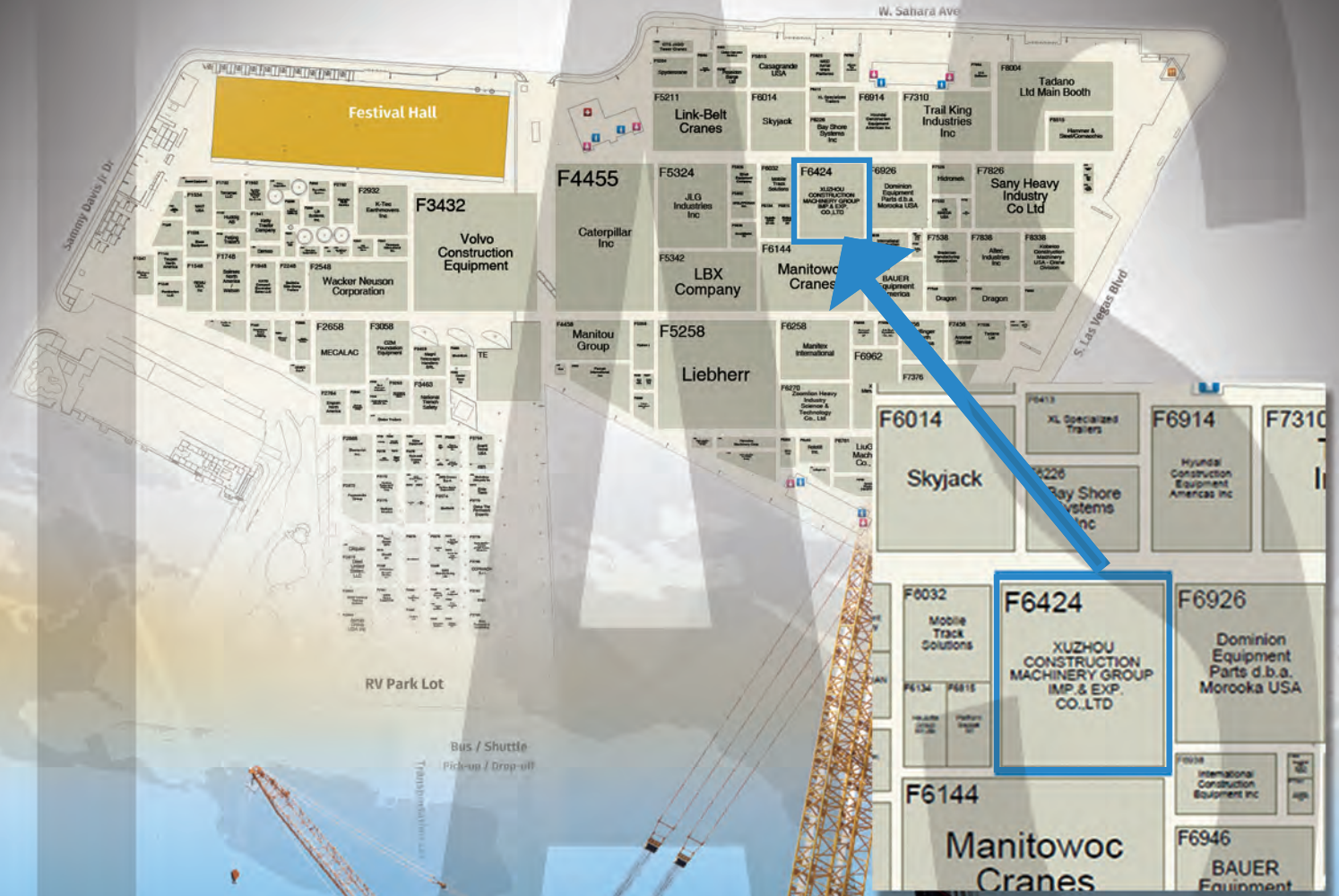


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Contents



On the cover:

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(page 88)

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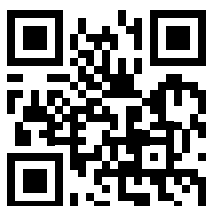
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NEWS

NEWS IN ASIA PACIFIC	12
NEWS IN ASIA PACIFIC & THE MIDDLE EAST	30
GLOBAL NEWS	32
IPAF HIGHLIGHTS	44

EVENTS

CALENDAR OF EVENTS	38
INDUSTRY EVENTS	40

PRODUCTS

NEW IN INDUSTRY	46
MIXED CATEGORY	56



150



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Contents

PROJECTS & SPECIAL FEATURES

APPLICATIONS ON SITE	60
PRODUCT & TECHNOLOGY FEATURE	64
TUNNELLING PROJECT	86
COMMERCIAL PROJECT	88
INDUSTRIAL PROJECT	90
FOCUS ON NORTH AMERICA	92



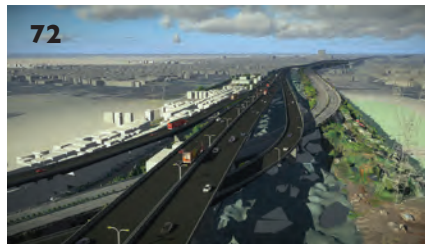
60



61



78



72



64



90



94



92



86



68

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Keppel breaks ground on Saigon Sports City project

The Keppel Group recently held the groundbreaking ceremony for Saigon Sports City, a 64-ha site that will be developed into a smart, integrated township located in the District 2 of Ho Chi Minh City, Vietnam. When completed, it will feature about 4,300 premium homes as well as Vietnam's one-stop sports, entertainment and lifestyle hub.

According to Keppel, biophilic design principles will be adopted in Saigon Sports City, including natural cross-ventilation throughout the development, generous space between buildings for natural light, a contiguous fitness circuit, lush landscaping with locally-sourced flora and picturesque water features with natural filtration, to create a green and beautiful environment.

Keppel said it will also work with local and international partners to offer innovative urban solutions including smart security, smart mobility and environmental infrastructure solutions, among others. The first phase of Saigon Sports City - scheduled for completion in 2022 - will comprise residential and commercial spaces as well as sports facilities.

"The groundbreaking of Saigon Sports City marks a new phase in Keppel's engagement of Ho Chi Minh City. Leveraging the Keppel Group's capabilities in providing solutions for sustainable urbanisation, Keppel Land and Keppel Urban Solutions are collaborating for the masterplanning and development of Saigon Sports City, which will be developed into a vibrant, integrated township and an iconic landmark in Ho Chi Minh City," said Loh Chin Hua, CEO of Keppel Corporation, senior management of Keppel Land and Keppel Urban Solutions.

"Keppel has been participating in and contributing to Vietnam's growth for close to three decades, especially in Ho Chi Minh City, where we have a quality portfolio of residential and commercial developments," he added.

At the groundbreaking ceremony, Tan Swee Yiow, CEO of Keppel Land, presented a contribution of VND 100 billion in support of infrastructural development in District 2 of Ho Chi Minh City. ■



Both images © Keppel Land



ABOVE AND LEFT: Work on Saigon Sports City has recently started. When completed, it will feature about 4,300 premium homes as well as Vietnam's one-stop sports, entertainment and lifestyle hub.

Haulotte and Linde collaborate in Chinese market

Haulotte Shanghai and Linde (China) Forklift Truck Corp Ltd have signed an agreement that sees Linde become one of the official distributors of Haulotte aerial equipment in mainland China, further expanding Haulotte's sales and service networks in the country.

Haulotte made an entry into China in 2006, and since then the company has been continuously exploring the market, getting close to the Chinese users and continuously providing reliable products and high-quality services for local customers.

Linde (China) Forklift Truck has been providing material handling system solutions for many years, including a full range of counterweight, forklift trucks and warehouse equipment, professional and comprehensive services, optimum integrated solutions for material handling, as well as logistics design and consultancy.

Through this cooperation, both companies will jointly expand and promote the development of mobile elevating work platforms (MEWPs) in the Chinese market, while providing customers with the best quality products and services. ■



The signing ceremony between Haulotte Shanghai and Linde (China) Forklift Truck Corp Ltd took place in October 2019.



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Vinci to build water treatment plant in Cambodia

Vinci Construction Grands Projets has signed a contract with the Phnom Penh Water Supply Authority to design and build the Bakheng water treatment plant, located in the northern outskirts of the Cambodian capital.

The first phase of the project, totalling US\$155 million (€141 million), covers the construction of several components. These include: the first treatment line with a capacity of 195,000 cu m/day; the intake in the Mekong River with a capacity of 390,000 cu m/day; two 1.4-m-diameter pipelines with a length of 1.5 km to carry water from the Mekong River to the treatment plant; and a 2-m-diameter pipeline with a length of 7.8 km (including a 630-m river crossing to be built using a microtunnelling machine) to bring drinking water to more than 500,000 inhabitants of the capital city.

To minimise the plant's carbon footprint, its electricity requirements will be partly supplied by 27,000 sq m of solar panels with 3.8 MW installed capacity, said Vinci.

The project, co-financed by the French Development Agency, the European Investment Bank and the Phnom Penh Water Supply Authority, is expected to employ more than 500 local workers and supervisory personnel at the height of activity.

According to Vinci, the contract provides for a second conditional works phase with a value of US\$45 million (€41 million). This phase is designed to double the plant's treatment capacity to 390,000 cu m/day. Following the handover of the



Vinci will design and build the Bakheng water treatment plant, located in the northern outskirts of Phnom Penh, Cambodia.

second phase, the project will provide drinking water for a population of one million.

The latest contract confirms Vinci Construction Grands Projets' commitment to expanding drinking water access in Cambodia. In 2017, the company handed over the Niroth drinking water plant on the outskirts of Phnom Penh and the wastewater treatment plants at the Phnom Penh and Siem Reap airports. In 2019, the company's hydraulic engineering teams delivered two drinking water plants in Siem Reap and Chamkar Mon (in the centre of the Cambodian capital). ■

Aurecon appoints new client director for infrastructure in Asia

Lili Tao (pictured) has been appointed as Aurecon's client director for infrastructure in Asia. She replaces Scott Smith, who is returning to Australia after 10 years in the region to take on the client director for transport – Victoria and South Australia.

Based in the Singapore office, Ms Tao will work with Hong Kong-based client director Keith Chong, the global client leadership team and the Asia leadership team to build on project successes such as the MRTA Purple Line in Thailand, Hong Kong West Kowloon Station and the recent awarding of the contract to design three of the first five stations on Singapore's Jurong Regional Line (JRL) as well as major structures for the rail line.

Since the start of her career in engineering, Ms Tao has acted as a 'bridge', bringing multiple disciplines together, initially for small projects then moving onto mega infrastructure like Crossrail in the UK, the Hong Kong International Airport expansion and the Offshore Marine Centre in Singapore.

She now has a different type of bridge challenge, bringing Aurecon's solid reputation for innovation, safety, quality and exceptional client delivery and growing



this in its major growth market, Asia. "Being a Bridge is not new to me. My journey brought me a long way from originally growing up in Beijing, working in the UK, to returning to Asia, initially being based in Hong Kong to now settling in Singapore – an international gateway," said Ms Tao.

"What this has taught me is in our global business world, when you can bridge cultures and transfer knowledge from one sector to another and continuously build on this, you can achieve really innovative outcomes and find solutions to complex problems for clients."

Ms Tao has a diverse Infrastructure background, having managed major infrastructure projects across the UK, Hong Kong, mainland China and in Singapore. As someone who grew up in an engineering family with her father a

telecommunications engineer and living near project sites, it was no surprise that Ms Tao was drawn to the profession.

"While I was working in the UK, I was an apprentice to the first female president of the Institution of Civil Engineers, Jean Venables CBE, which gave me invaluable insight into how senior female figures operate in the industry. It stressed to me the importance of having female role models who are changing the industries they work in for the better for young aspiring engineers," said Ms Tao.

It is something Ms Tao is passionate about and is keen to increase the diversity of people and ideas to reflect those of Aurecon's clients and its clients' customers so that infrastructure is designed with the user at the centre.

In recent years, Ms Tao has held several roles at Aurecon, including lead project manager and technical director, and project services lead for Singapore.

"Lili has demonstrated a unique ability to tackle complex technical challenges with good business acumen. It's this passion that allows her to make the complex simple for our clients," said Ben Stapleton, Aurecon's managing director for infrastructure. ■

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BA24RT(24m) **BA28RT**(28m)



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CDL and CapitaLand to redevelop Liang Court site

City Developments Limited (CDL), CapitaLand Limited and Ascott Residence Trust (Ascott Reit - a member of CapitaLand) have teamed up to redevelop the Liang Court site in Singapore into an integrated development. It is targeted to open in phases from 2024.

Subject to approval from the relevant authorities, the proposed development with a total gross floor area of 100,263 sq m will comprise two residential towers offering around 700 apartment units, a commercial component, a hotel and a serviced residence with a hotel licence.

Upon completion, the 50:50 CDL-CapitaLand joint venture entities will own the residential and commercial components while Ascott Reit will own the 192-unit serviced residence with a hotel licence. CDL Hospitality Trusts (CDLHT) will own the hotel, which will have about 460 to 475 rooms.

The consortium also plans to rejuvenate the river promenade flanking the property - in line with Singapore's Draft Master Plan 2019 by the Urban Redevelopment Authority (URA) to enhance the area's vibrancy. This is expected to generate social activities around the new development, increase footfall and improve pedestrian accessibility along the Singapore River.

The Singapore River planning area is a vibrant local and international icon – home to a myriad of cultural, heritage and lifestyle offerings. Situated in the heart of Clarke Quay – Singapore's most popular riverfront lifestyle and entertainment precinct – and on the fringe of Singapore's CBD, the proposed development is linked to the Central Expressway via River Valley Road.

"With multiple frontages, breathtaking views and convenient access to Fort Canning MRT Station, the Liang Court site has outstanding locational attributes for an integrated development comprising residential, commercial, hotel and serviced residence components. By harnessing the strengths and capabilities of all the partners involved, we plan to transform the site into an iconic landmark along the Singapore River," said Sherman Kwek, group CEO of CDL.



CDL, CapitaLand and Ascott Reit have teamed up to redevelop the Liang Court site in Singapore into an integrated development, featuring 700 residential apartments, a commercial component, a hotel and a serviced residence.

"The commercial component of the integrated development will be seamlessly connected to Clarke Quay, offering residents the convenience of top-notch F&B and retail offerings right on their doorstep," said Jason Leow, president for Singapore & International at CapitaLand Group. "Drawing on CapitaLand's extensive experience in creating award-winning integrated developments, we will harness our partnership with CDL to shape the property into a fresh focal point along the Singapore River for local and international visitors of all ages." ■

Tiong Seng and Ngee Ann Polytechnic team up for construction robotics lab

Tiong Seng Holdings Limited has signed a research collaboration agreement with Ngee Ann Polytechnic (NP) to set up Singapore's first jointly-established construction robotics lab by a private-sector enterprise and an Institute of Higher Learning (IHL).

As part of a five-year strategic collaboration, Tiong Seng and NP will work on applied R&D in the field of industrial-grade robotics for the construction industry. Located within the NP campus, the newly established Tiong Seng-NP Construction Robotics Lab aims to combine Tiong Seng's technological expertise and market know-how with NP's strong robotics R&D arm to develop useful robotic solutions for the built environment sector.

The potential applications conceptualised at this early stage include AI-enabled robotic inspectors for construction sites. Apart from empowering quality checkers and supervisors with precision robotics to ensure better accuracy and higher quality output, the robotic inspectors will also facilitate consistent inspection procedures across all construction projects.

Since 2014, NP has developed many successful robotic applications for various sectors including the healthcare and

education industries. Supported by NP's strong R&D capabilities and established track records, the Group aims to leverage this platform to groom young talent in the robotics field, enhance competency and generate new waves of innovation and breakthroughs for the built environment sector.

"We believe this collaboration has the potential to yield long-term synergistic benefits for both parties and the sector as a whole. Supported by Ngee Ann Polytechnic's proven R&D capabilities and established track record in robotics, we are confident of leading the charge in developing unique and intelligent construction solutions to enhance productivity, safety and the quality of our projects," said Pek Lian Guan, CEO of Tiong Seng Holdings Limited.

"Over the longer term, these efforts will also complement the government's overarching vision of streamlining construction processes while creating new and better jobs in the sector. Beyond capability development, this joint lab serves as an avenue for Tiong Seng to give back to the community by grooming budding talent crucial for the advancement of our industry in the coming decades." ■



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Gammon wins AMC project in Hong Kong

Gammon Construction Limited, jointly owned by Jardines and Balfour Beatty, has been awarded a HK\$4.75 billion contract to build the Advanced Manufacturing Centre (AMC) for the Hong Kong Science & Technology Parks Corporation (HKSTP).

Located in Tseung Kwan O Industrial Estate, the project mainly involves the construction of a nine-storey building block with a nine-storey basement, providing 108,000 sq m of space. It also includes a footbridge connecting the Data Technology Hub of the adjacent site and a seawater district cooling system. The cooling system – that will be used to cool the entire AMC building - is a cost-effective and environment-friendly solution for building cooling.

Thomas Ho, chief executive of Gammon said, “We are delighted that HKSTP has once again selected Gammon to work with them, following the successful completion of Science Park Phase 3a, 3b and 3c. Our skilled professionals will bring in a high level of service and quality necessary to complete this project, which will benefit multiple industries by providing advanced and scalable manufacturing facilities indicative of the ‘Re-industrialisation of Hong Kong.’

“Gammon will also be implementing methods and approaches that support the Government’s Construction 2.0 initiative, which centres on innovation, professionalisation and revitalisation,” added Mr Ho.

Such approaches will include the adoption of ‘integrated digital project delivery’ on the contract, for which centralised and shared building information modelling (BIM) will form a key element. In addition to 3D, 4D and 5D digital models, an 8D model will provide an open design-collaboration platform for all stakeholders. The company also aims to achieve 75% offsite prefabrication of the structural steel works, and 70% off-site modularisation of the mechanical, electrical and plumbing (MEP) works. This will provide significant advantages to the works in terms of safety, quality and programme.



An artist's impression of the Advanced Manufacturing Centre for the Hong Kong Science & Technology Parks Corporation.

The project will also adopt a self-developed digital solution - *Inspecto* - for site inspections. Comprising a mobile app, a dashboard and proactive real-time alerts, *Inspecto* shortens the inspection turnaround time, creates less disturbances on site, and keeps reliable and consistent records for further reference. In addition, a common data environment will be established for collecting, managing and sharing information among the project teams including the client, consultants, suppliers and subcontractors.

Work has commenced in August 2019 and is expected to be completed by 2021. A workforce of 1,800 will be engaged at the peak construction period. ■

New Genie director of technical services for Asia Pacific and China

Craig Kittle has been appointed as Genie director of technical services for Asia Pacific (APAC) and China at Terex AWP, supporting aerial equipment customers in the APAC countries - including Australia - and China.

In this role, Mr Kittle is responsible for coordinating and actively managing the Genie brand’s technical service, used equipment and product support operations for APAC, Australia and China. He started his new role on 8 July 2019 and supports the region from the Genie offices in Brisbane, Australia.

“Craig has jumped right into the role and is adding tremendous value in the region for Genie,” said Matt Treadwell, Genie vice president of parts and services at Terex AWP. “Initially, his focus has been to develop and build customer-focused strategies, as well as to implement processes, systems and tools that enable Genie



to deliver excellent service to our customers. Craig’s ongoing efforts will continue to endorse Terex AWP as a strong technical services leader in the region.”

In addition, Mr Kittle will also lead and be accountable for excellent and seamless collaboration between the Genie brand’s technical service, used equipment and product support teams, as well as other business functions, including engineering, sales and marketing, and operations to better serve Genie customers throughout the region.

Prior to taking on this new role, Mr Kittle served as director of operations at the Terex manufacturing facility in Oklahoma City, USA. ■

LEFT: Craig Kittle is now supporting Genie customers in the Asia Pacific countries - including Australia - and China.

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Liebherr opens new facility in Korea, gets major orders

Liebherr has opened a new training and service centre in South Korea to meet the growing demand for after-sales service. The company has also received an order for 25 new mobile cranes from local customers, scheduled for delivery by the end of 2019.

Liebherr Mobile Cranes Korea Ltd was established as a subsidiary of Liebherr-Werk Ehingen GmbH in June 2002. It is responsible for the sales and service of Liebherr mobile and crawler cranes, and now also in charge of MK mobile construction cranes. According to Liebherr, South Korea has developed into a major market for MK mobile construction cranes.

The new training and service centre - with warehousing areas for spare parts and cranes - are located approximately 60 km to the south of Seoul. The opening ceremony for the facility was held in September 2019.

Crane handovers

At the opening ceremony, the first Liebherr LTM 1230-5.1 mobile crane in Korea was handed over to Goryeo Crane. This 230-t model will replace an LTM 1200-5.1 with a lifting capacity of 200 t.

Goryeo Crane, a crane rental company based in Busan, owns 10 Liebherr all-terrain cranes with lifting capacities between 60 t and 500 t. The machines are used mainly in the Busan region on industrial and infrastructure building sites and for erecting tower cranes.

In addition, crane contractor Samsung Heavy Equipment Ltd has bought more mobile cranes from Liebherr. The company took delivery of an LTM 1095-5.1 and an LTM 1300-6.1 at the manufacturing plant



in Ehingen in October 2019, and has also placed an order for a new LTM 1110-5.1 which is scheduled for delivery in mid-2020.

Based in Ulsan, Samsung Heavy Equipment has a total of 30 cranes - a large proportion of which are Liebherr models. The machines' lifting capacities



range from 60 to 800 t. Samsung's newly acquired mobile cranes will replace the older machines. The company's main areas of operations include industrial construction and infrastructure projects as well as several large refineries in the Ulsan region. ■



LEFT: The new Liebherr training and service centre in South Korea.

BELOW LEFT: The handover of the LTM 1230-5.1 to Goryeo Crane.

BELOW: The handover of the LTM 1095-5.1 and LTM 1300-6.1 to Samsung Heavy Equipment.

Liebherr delivers five fast-erecting cranes to Japan

The Japanese crane company Cranetal Noda has extended its Liebherr tower crane fleet with the addition of five 53 K/J fast-erecting cranes. The handover took place at the end of August 2019 as part of a three-day introduction training.

The 53 K/J cranes offer a maximum lifting capacity of 2.8 t and a radius of up to 40 m. They feature an excellent adaptability due to seven hook heights between 15.8 m and 31 m as well as four jib lengths between 28 m and 40 m.

The cranes have been adapted especially to the Japanese market, so that they can withstand earthquakes measuring nine on the Mercalli scale as well as hurricanes of 200 km/h in accordance with the standards.

In 2016, Cranetal Noda had already bought five 42 K/J cranes. "We have had many positive experiences with our seven 42 K.1/J. Our service technicians as well as our customers are extremely pleased with the crane. So it was logical to buy some more of these cranes," said Hirofumi Aoki, general manager of Cranetal Noda.

Cranetal Noda belongs to the Noda Crane Group and



The handover of the Liebherr 53 K/J fast-erecting cranes to Cranetal Noda.

is based in Ogaki City, with a workforce of around 50 (the group has approximately 180). Cranetal Noda intends to modernise its fleet of more than 100 tower cranes as well as some crawler cranes in particular for bridge and other infrastructure projects. ■



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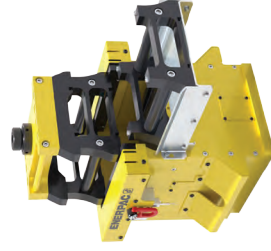
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Mapletree to transform St James Power Station

Mapletree Investments Pte Ltd will be transforming one of Singapore's national monuments - St James Power Station (SJPS) - into a technology centre with a heritage gallery. It is set to become one of the first elements in the wider 'live, work, play' transformation plans for the Greater Southern Waterfront development.

Slated for completion in the second half of 2020, the newly restored and retrofitted power station will provide about 110,000 sq ft of space for Dyson, a leading global technology company. SJPS is expected to increase Dyson's research and engineering footprint in Singapore two-fold, and sit at the centre of its ambitious global expansion.

Befitting its history, the restored monument will house a Heritage Gallery in one of its distinctive chimneys to showcase its contribution to Singapore as a power station. Complementing that, Mapletree will also create a Heritage Trail around the monument featuring maritime artefacts. According to the company, these plans will be further developed in collaboration with Dyson to demonstrate their care and passion for historical sites as well as their commitment to Singapore and SJPS.

"SJPS is a treasured and iconic national monument with a rich history. As we move forward, Mapletree aims to revitalise the monument as part of the upcoming Greater Southern Waterfront development," said Amy Ng, regional CEO for South East Asia & Group Retail at Mapletree. "From its origins as Singapore's first coal-fired power station, SJPS will soon find a new lease of life as a centre of innovation, generating exciting ideas and future technologies."



St James Power Station was gazetted as a national monument in 2009.

Mapletree said that SJPS will be integrated with the larger plans for the entire HarbourFront Precinct – owned and managed by Mapletree – to harness the synergy from the wider transformation of the Greater Southern Waterfront, especially when plans for Pulau Brani and the surroundings are activated after the port moves out. ■

Yoma and AC Energy partner for Myanmar's renewable energy projects

Yoma Strategic Holdings has formed a strategic partnership with AC Energy Inc, the energy platform of major Philippine conglomerate Ayala Corporation. The two companies are looking to establish a 50:50 joint venture (JV) to work together in driving the growth of Yoma Micro Power (S) Pte Ltd.

The new JV plans to invest in Yoma Micro Power and will jointly explore developing around 200 MW of additional renewable energy projects within Myanmar, including participation in large utility scale renewable projects.

"Supply of electricity is one of the largest opportunities in Myanmar and also one of the biggest bottlenecks for economic development," said Melvyn Pun, CEO of Yoma Strategic. "We are excited to have AC Energy as our partner to drive sustainable and inclusive economic growth. AC Energy's international expertise in the renewable energy sector and the access to funding will be invaluable as we work together to service this huge, underserved market in Myanmar."

Patrice Clause, COO of AC Energy Renewables said, "This is a very meaningful investment for AC Energy, as we intend to participate in Myanmar's renewables sector in a significant way. We are delighted to partner with Yoma Strategic who shares the same aspiration to build a meaningful portfolio in renewable energy and together, be able to contribute to creating an environmentally sustainable future."

According to the World Bank, the electricity consumption

in Myanmar is estimated to grow at an average annual rate of 11% until 2030 to achieve complete electrification in all households, with an expected investment of around US\$2 billion per year required. The Myanmar Government's energy masterplan envisions solar power contributing up to 5% of the nation's electricity as the country shifts away from hydropower and natural gas sources. In addition, the government's recent hike in electricity tariffs has also reportedly enhanced the attractiveness of solar energy solutions to the commercial and industrial segment.

"The renewable energy sector is a scalable business, which has the potential to generate a sizeable revenue stream with recurring cashflow to complement Yoma Strategic's core businesses. Myanmar has one of the lowest electrification rates in Asia, with more than 60% of the population without access to grid electricity, particularly in rural areas. There is a need to significantly increase generation capacity and build out last mile distribution infrastructure, which Yoma Micro Power has embarked upon," said Mr Pun.

Yoma Micro Power builds micro power plants and mini-grids that provide electricity to off-grid rural communities and telecommunications towers in Myanmar. Following the successful implementation of the 10-site pilot project in 2018, Yoma Micro Power was rolling out 250 micro power plants by the end of 2019 and is expected to scale up to more than 2,000 sites by 2023. ■

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LTA awards Tengah Depot contract for JRL project

Singapore's Land Transport Authority (LTA) has awarded the civil contract for Tengah Depot - part of the Jurong Region Line (JRL) project - to China Railway 11 Bureau Group Corporation (Singapore Branch). This S\$739.5 million contract is to design and construct the Tengah Depot and its associated facilities. Construction work is expected to commence in 2020 and is slated for completion in 2026.

Located adjacent to the west of Tengah New Town, the at-grade Tengah Depot will be Singapore's 10th MRT depot. It comprises an Integrated Rail and Bus depot, ancillary buildings and a transport workers' dormitory.

The Tengah Depot occupies a 44.5-ha site and is designed for the stabling and maintenance of 100 four-car trains and 600 buses as well as their associated maintenance facilities. To optimise land use, the depot will also include a four-storey transport workers' dormitory that can accommodate 450 bus captains.

China Railway 11 Bureau Group Corporation (Singapore Branch) has completed various rail-related projects worldwide. In Singapore, the company has completed several major infrastructure projects including three MRT stations (namely Tuas Link, Tuas West Road



An artist's impression of Tengah Depot.

and Tuas Crescent stations) and their associated railway viaducts - on the East-West Line's Tuas West Extension. The company also constructed Singapore's first integrated Rail and Road Viaduct as part of the Tuas West Extension project. ■

Gamuda adds three Potain MCT 385 tower cranes to its fleet

Malaysian equipment rental company Megah Sewa - the plant and equipment subsidiary of Gamuda, the largest infrastructure development company in Malaysia - has added three Potain MCT 385 topless tower cranes to its fleet for the first time. The company chose these units in particular to improve project completion times and to work within its parent company's new Gamuda Intelligent Building System division, which handles prefabricated construction.

"We have tight schedules for our projects, so we need reliable cranes that could help reduce the project time and manual labour requirements," said Foong Seng Aun, general manager of Megah Sewa. "Also, with the increasing popularity of precast construction we need cranes with the capacity and reach to handle the larger components this method requires."

The first MCT 385 crane was deployed at Kuala Lumpur's Serai Development, a 21-storey luxury condo that was completed in 2019. With a maximum capacity of 20 t and maximum radius of 75 m, the Potain MCT 385 with a freestanding height of 61.5 m and loading capacity of 6.3 t at the working radius of 50 m was comfortably able to lift the heavy precast components and steel reinforcement used in the project. And the precast concrete blocks came in a range of shapes and sizes, forming the walls, facades, shelters, ledges and more in the condo's design.

"The MCT 385's compact mast and jib, plus its streamlined counter-jib, optimises its ability to work in Kuala Lumpur's urban areas and tight spaces," said Mr Foong.

The other two MCT 385 cranes have been deployed to another project, the Cybervalley affordable home project in the Sepang District in the state of Selangor. The project is located on 14.4 acres within the Selangor Cyber Valley, a 1,300-acre planned 'smart city' by Perbadanan Kemajuan Negeri Selangor (PKNS), the state's development corporation developing this subsidised housing project.



Megah Sewa has added three Potain MCT 385 topless tower cranes to its fleet for the first time. The units have been deployed on residential projects in Kuala Lumpur and Sepang, Malaysia.

The MCT 385 was jointly designed by Manitowoc engineers in Europe and Asia to serve a variety of markets. Other equipment in Megah Sewa's fleet includes 12 tunnel boring machines and a wide range of earthmoving machinery. Megah Sewa purchased all its Manitowoc cranes from dealer Inflextec Engineering (IFT), which is based in Kuala Lumpur.

"Manitowoc manufactures high-quality cranes. Plus, the dealer IFT provides great service - ensuring the cranes are delivered on time and installed efficiently for a smooth project kickoff," said Mr Foong. ■

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Surbana Jurong secures housing project in India

Surbana Jurong has won an affordable housing project in Gujarat, India, marking a significant milestone for the company as it extends its affordable housing expertise beyond Singapore.

The project, awarded by the Gujarat Housing Board, will see Surbana Jurong provide master planning, concept design, design review and project management services for approximately 15,000 homes across 12 sites in the next four years. These sites are located in cities with high population densities – Ahmedabad, Surat, Vadodara and Rajkot.

According to Surbana Jurong, the project will incorporate some of Singapore's best practices to make Gujarat's public housing more vibrant, sustainable and liveable. The concept design embodies key principles drawn from Singapore's townships, including connectivity, environmental sustainability, social community, safety, universal design, construction productivity and maintainability.

The township design for the Gujarat project will foster social interactions by featuring community-centric spaces such as roof gardens, activity courtyards, playgrounds and outdoor fitness stations. These facilities will be located within safe and vehicular-free community spaces.

Surbana Jurong said that the Gujarat townships will include some of Singapore's distinctive public housing features, like void decks. There will be other modern lifestyle amenities as well, such as sky gardens, outdoor dining areas, meditation decks and play lawns. These features are considered new to Gujarat, expected to set a precedent for future affordable housing in India.

The concept plan also ensures that each housing plot has its distinctive design and unique identity, in response to the cultural and geological context of each site. To ensure construction productivity, the design of the townships will be modular and adaptive to suit different sites.

The Gujarat Housing Board has built homes in urban cities such as Ahmedabad, Surat, Rajkot, Bhavnagar, Jamnagar, and towns such



Aerial view of one of the Gujarat townships designed by Surbana Jurong.



Central community space flanked by apartment blocks that are modelled after Singapore's public housing design and adapted for Gujarati context.

as Bhuj, Vapi, Bharuch, Veraval, Porbandar and Gandhidham. The Board is committed to achieve the target set by the Prime Minister of India to provide housing for all by 2022.

"We are inspired by Singapore's public housing model," said Lochan Sehra, commissioner of Gujarat Housing Board. "We believe that through Surbana Jurong's deep expertise and strong track record in Singapore's public housing and global townships, we can redefine public homes in Gujarat and uplift the residents' quality of life. Many of the features are new to Gujarat and will potentially set a precedent for future affordable housing in India." ■

ADB supports power plant project in Thailand

The Asian Development Bank (ADB) and Gulf PD Company Limited (Gulf PD) have signed a US\$180 million agreement to build and operate a 2,500-MW combined cycle gas turbine power plant in the Rojana Rayong 2 Industrial Park of Thailand's Rayong Province, about 150 km southeast of Bangkok.

ADB's support is composed of a regular loan of US\$50 million and a B loan of up to US\$85 million. ADB will also mobilise US\$45 million through the Leading Asia's Private Infrastructure Fund (LEAP), established in 2016 and supported by the Japan International Cooperation Agency. ADB signed the loan agreement with its cofinanciers - the Japan Bank for International Cooperation and 12 other international and local commercial banks - playing an anchor lender role in the project by catalysing up to US\$764 million in commercial cofinancing. The B loan will be funded by Singapore's Oversea-Chinese Banking Corporation and Germany's DZ Bank.

"The project will build the fourth-largest power plant and one of the largest combined cycle gas turbine power plants in Thailand, which will be key in the Eastern Economic Corridor (EEC) development plan, considered as the prime economic growth

driver for the country until 2028," said Christopher Thieme, deputy director general for private sector operations at ADB.

The plant is scheduled to be fully operational by 2024, delivering at least 16,000 GW-hours of electricity to users. With the advanced combined-cycle gas turbine technology to be used at the plant, the project will mean 1 million fewer tons of carbon dioxide is emitted every year compared with current electricity grid emissions. The plant will be integral to sustaining Thailand's energy security, given that more than 8,500 MW of generating capacity - equivalent to about 20% of current national energy capacity - of ageing power plants will be retired between 2020 and 2025.

Gulf PD is owned by Independent Power Development, a joint venture between Gulf Energy Development Public Company Limited (GED) and Mitsui & Co Ltd. Gulf PD was established in 2012 to develop, construct, own, and operate the 2,500 MW power plant. GED is a leading power generation company with the largest portfolio of contracted power purchase agreements in Thailand. Mitsui, established in 1947, is one of Japan's largest trading companies involved in the development of more than 74 power projects globally. ■



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Lendlease opens Paya Lebar Quarter development

The Paya Lebar Quarter (PLQ) development in Singapore is now open to the public. This S\$3.7 billion, 4-ha landmark urban regeneration project by Lendlease is set to catalyse the transformation of Paya Lebar Central - a 12-ha centrally located sub-regional hub - into a dynamic and vibrant business and lifestyle precinct.

PLQ also supports Singapore's car-lite vision with its excellent connectivity, providing direct links to the dual-line Paya Lebar MRT interchange and seamless connection to the wider Park Connector Network. Construction of the project commenced in January 2016.

PLQ comprises close to 1 mil sq ft of office spaces available in three Grade-A towers, a shopping mall featuring a retail area of approximately 340,000 sq ft with more than 200 shops, a wide range of indoor and alfresco dining set in green public spaces of over 100,000 sq ft, and a 429-unit residential development (Park Place Residence).

As part of its Community Development Plan, PLQ has been actively engaging the community from the start of the project in 2015, including the conceptualisation of events and activities to be held at its 100,000 sq ft of green public spaces.



The 4-ha Paya Lebar Quarter (above) is set to catalyse the transformation of Paya Lebar Central into a dynamic and vibrant business and lifestyle precinct.

PLQ has also been engaging with schools in the area and is partnering a secondary school for the next three years to enable their students to learn about sustainability using PLQ as a case study. Other initiatives are in the works as well, including the creation of an online portal to support sustainability education by schools.

"Urban regeneration is a key pillar of Lendlease's strategy. Every day around the world, we work with cities and governments to create the best places. Today, we have before us a truly world-class example of what can be achieved when government



TOP AND ABOVE: The grand opening ceremony for Paya Lebar Quarter was held in October 2019.

and companies such as Lendlease partner with local communities to deliver game-changing urbanisation projects that will leave a positive legacy for the community for generations to come," said Steve McCann, group CEO and managing director of Lendlease. ■

'Thailand construction industry set to reach US\$27.9 bil in 2023'

The Thailand construction industry's output value in real terms is expected to rise from US\$23.5 billion in 2018 to US\$27.9 billion in 2023, measured at constant 2017 US dollar exchange rates, according to data and analytics company GlobalData.

The company's report, 'Construction in Thailand - Key Trends and Opportunities to 2023' reveals that Thailand had gained the growth momentum in 2018, with output expanding by 2.7% in real terms after a slump of 2.8% in 2017. The industry's expansion will be driven by the government's efforts to develop the country's transport infrastructure, coupled with efforts to boost the residential construction market.

Dhananjay Sharma, analyst at GlobalData said, "The growth of the industry during the forecast-period is expected to be supported by the government's focus on the development of transport and energy infrastructure in the country. Under the Southern Economic Corridor (SEC) project, the government plans to invest THB106.8 billion (US\$3.4 billion) towards the development of 116 projects during the period of 2019-2022.

"The focus on the development of the energy sector is also expected to drive the industry growth. The government plans to add 56,431 MW of new power capacity by 2037 under the updated power development plan (PDP 2018-2037). In addition, investments under the Eastern Economic Corridor (EEC) scheme

to develop infrastructure in Chachoengsao, Chonburi and Rayong provinces are expected to support construction industry growth over the forecast period."

Residential construction was the largest market in the Thai construction industry between 2014 and 2018, accounting for 40.9% of its total value in 2018. The market is expected to follow a similar trend over the forecast period, with residential construction accounting for 40.3% of the industry's total value in 2023. Market output over the forecast period is expected to be supported by the ongoing urbanisation and government efforts to balance housing demand and supply through building low-cost housing units.

In the first half of 2019, the government announced plans to allocate THB 4 billion (US\$125.6 million) to finance five low-cost housing projects in the country while in the 2020 budget, the government allocated THB650 billion (US\$20.4 billion) towards capital expenditures.

Mr Sharma concluded, "The total construction project pipeline in Thailand, as tracked by GlobalData including all mega projects with a value above US\$25 million, stands at THB11.5 trillion (US\$355.9 billion). The pipeline, which includes all projects from pre-planning to execution, is skewed towards late-stage projects, with 60.3% of the pipeline value being in projects in the pre-execution and execution stages as of October 2019." ■

New Green Mark scheme for transit stations in Singapore

Singapore's Building and Construction Authority (BCA) has introduced a new Green Mark scheme for transit stations, which was developed in consultation with Land Transport Authority (LTA) and industry practitioners involved in station developments, to ensure that their design, construction and operation can be enhanced in an environmentally sustainable way.

The scheme was piloted in four of Singapore MRT stations over the past year. Canberra Station is the first to be accorded the Green Mark Platinum award under the new scheme. Adapted from the BCA Green Mark scheme established in 2005, the new Green Mark for Transit Stations scheme was tailored to the specific needs and operational requirement of transit stations in Singapore. Besides setting a high standard for energy performance, the scheme also considers criteria such as integration with its surroundings with the seamless connectivity and accessibility to all public transports nodes such as bus stops and taxi stands.

The scheme also places high emphasis on ventilation performance of the station design, which enhances the thermal comfort of users. At least 50 stations are estimated to be in the pipeline to meet the Green Mark Platinum standard, and from these developments, there is an estimated reduction in energy consumption of about 33 GWh per annum, which translates to the energy used to power up 7,500 four-room HDB flats per year.

"BCA has been constantly reviewing and improving the Green Mark scheme to ensure that it remains relevant to the evolving needs of the people and the built environment. With the increasing demand for transit facilities, this new addition to the suite of Green Mark schemes will provide a holistic framework to enhance the sustainability of transit stations," said Hugh Lim, CEO of BCA. "We are glad to have LTA's support in the development of this new scheme as we continue to push for higher environmental sustainability standards, as part of Singapore's efforts to mitigate the environmental impact of urbanisation."

Canberra Station was constructed with an extensive use of environment-friendly materials and products. The



Canberra Station features an extensive use of environment-friendly materials and products. It is the first to be accorded the Green Mark Platinum award under the new Green Mark for Transit Stations scheme recently introduced by BCA.

station incorporates biophilic design to help liven and enhance commuters' experience with edge planting, green roof and vertical greenery along with daylighting provision within the platform, helping to provide thermal comfort as well as visual relief.

During the design stage, the design team also conducted an in-depth study to ensure the effectiveness of weather protection measures against wind-driven rain for commuters' comfort. This ensures that the station remains well-ventilated at all times, even while minimising infiltration of rain during heavy showers. The station is also equipped with automatic dual speed escalators, energy efficient lift system, LED lighting, water-efficient fittings and an irrigation system with rain sensor.

"As part of our long-term vision to provide a transport network that is convenient and well-connected, we will be adding new stations to our existing network over the next few years. In tandem with our goal of improving rail connectivity, we are equally committed to implementing practices that promote environment sustainability throughout the planning, design and construction of our stations. The Green Mark Platinum certification for Canberra Station shows our efforts are on the right track and encourages us to strengthen our efforts," said Ngien Hoon Ping, chief executive of LTA. ■

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Qatar announces international airport expansion

Hamad International Airport (HIA) in Doha, Qatar, has revealed plans for its second expansion phase, which will offer a 10,000 sq m indoor tropical garden in a central concourse as well as a 268 sq m water feature that will be the focal point of the project.

This second expansion phase at HIA consists of Phase A and B. Phase A will comprise the central concourse linking concourses D and E. Construction is to commence by early 2020 and will increase the airport's capacity to more than 53 million passengers annually by 2022. Phase B, which is scheduled to be completed after 2022, will extend concourses D and E to further enhance the airport's capacity to more than 60 million passengers annually.

The expansion plan also includes 11,720 sq m of landscaped retail and F&B space, plus a 9,000 sq m Al Mourjan lounge that will offer additional spas, gymnasiums, restaurants and business centres as well as other passenger facilities.

"The expansion will continue to redefine the airport experience, cementing HIA's reputation as a destination gateway and critical international hub. Our expansion has been designed to seamlessly integrate

with the existing terminal, allowing smooth passenger flow and improving the overall passenger experience by minimising travel distances for connections and providing clarity and intuitive wayfinding. Our ultimate aim at HIA is to become a destination in our own right, not just a gateway," said Engr. Badr Mohammed Al Meer, chief operating officer at HIA.

The terminal building is set to be the first airport in the MENA region to achieve a 4-star Global Sustainability Assessment System (GSAS) rating. The terminal also aims to be a LEED Silver certified building with innovative measures of energy efficiency across the entire building.

In addition, the expansion will see the construction of a new cargo terminal that will increase its capacity to an estimated 3.2 mil t/yr. The new terminal is slated to be ready by 2023 and will be a multi-level facility with 85,000 sq m building footprint, across three levels as well as three mezzanine levels providing approximately 323,000 sq m of gross floor area. ■



An artist's impression of the new central concourse retail (above left) and the garden (left) at HIA.

Samsung C&T receives three Zoomlion ZCC850H cranes

Antar Cranes Services Pte Ltd recently delivered three Zoomlion ZCC850H crawler cranes to Samsung C&T Corporation for use on the Thomson-East Coast Line MRT project in Singapore (contract TEL T313). The handover ceremony took place on 14 December 2019 at the project site attended by Nelson Lim, managing director of Antar Cranes Services Pte Ltd and Edward Moon, project director at Samsung C&T Corporation. (See page 68 for information on the arrival of Zoomlion ZCC850H in Singapore)



Nelson Lim (left), MD of Antar Cranes Services handing over the ZCC850H cranes to Edward Moon, project director at Samsung C&T.



The Zoomlion ZCC850H crawler cranes will be working on the Thomson-East Coast Line MRT project.

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Bentley and Topcon form new joint venture company

Bentley Systems and Topcon Positioning Systems have established a new joint venture company, Digital Construction Works (DCW). It provides digital automation, integration, and ‘twinning’ services around a portfolio of fit-for-purpose software and cloud services, from Topcon, Bentley, and other software vendors, to realise the breakthrough potential of constructioneering, for industrialising construction.

The new company is led by CEO Ted Lamboo, previously senior vice president of strategic partnerships at Bentley, and COO Jason Hallett, formerly vice president of digital construction and business development at Topcon.

Bentley and Topcon teamed up in 2016 to jointly develop enhanced integration between their respective Magnet and ProjectWise cloud services so that engineering and construction workflows could be integrated for improved project quality and performance. Since then, both companies have continuously introduced new ‘4D’ innovations in surveying, reality modelling, scheduling and logistics, work packaging, machine control, and progressive assurance for construction.

In 2017, they together opened Constructioneering Academies, including at Topcon’s ‘sandbox’ facilities globally, for construction professionals to experience new digital best practices, first-hand. During 2018, the companies assimilated Bentley’s Synchro and Topcon’s ClearEdge3D acquisitions into constructioneering offerings.

Now, DCW is chartered to embed its experts within constructors’ major project teams to advance and optimise constructioneering processes for delivering better design-build outcomes. Through its digital integration services, to connect and automate constructors’ existing processes with constructioneering, DCW can make the best projects better while also helping to institutionalise these digital workflows throughout a constructor’s full project portfolio. At the same time, experiences gained by DCW will help guide Bentley and Topcon in prioritising their constructioneering software development investments.

“When we and Topcon recognised the opportunity for constructioneering to finally industrialise capital project delivery, we committed respectively to completing its software requirements. Indeed, our new software capabilities make possible



Both images © Bentley Systems

The establishment of Digital Construction Works (DCW) was officially announced at the 2019 Year in Infrastructure (YII) Conference in Singapore.



Ted Lamboo, CEO of DCW, speaking at the YII Conference. Standing behind him are (from left) Jason Hallett, COO of DCW; Ray O’Connor, president and CEO of Topcon; and Greg Bentley, CEO of Bentley.

construction digital twins - converging digital context, digital components, and digital chronology. What remains, in going digital for infrastructure construction, is for constructors’ people and processes to take advantage of the technology,” explained Greg Bentley, CEO of Bentley Systems.

Ray O’Connor, president and CEO of Topcon Positioning Systems added, “What Topcon and Bentley Systems initiated in recent years was done in the spirit of changing mindsets and processes on how we approach construction, and that collaboration has led to the development of this joint venture. The creation of Digital Construction Works perfectly aligns with our focus of helping the industry succeed in meeting infrastructure demands through technological innovations.” ■

Stefan Widing named president and CEO of Sandvik



As of 1 February 2020, Stefan Widing (left) will be the new president and CEO of Sandvik. He succeeds Björn Rosengren, who is leaving Sandvik at the same time, as previously announced.

Mr Widing has been serving as executive vice president of Assa Abloy and president of HID Global Corporation - a technology division within Assa Abloy - since 2015. Prior to this, he was general manager for Assa Abloy’s Shared Technologies and before that he held various positions in Assa Abloy and SAAB Aerospace.

“We are very pleased that Stefan Widing will take on the position as president and CEO of Sandvik. Stefan is a highly

appreciated leader with a solid industrial track record of developing organisations and businesses, both organically and through acquisitions. In addition, his competence in advanced technologies and experience from leading digital transformations will be another valuable asset to Sandvik. Stefan definitely has the capabilities needed to continue the decentralised way of working and to ensure Sandvik’s future development,” said Johan Molin, chairman of the Sandvik board of directors.

“I really look forward to joining Sandvik. I’m convinced that such a technologically advanced industrial group, recognised for its very competent employees, has a lot of future potential not the least by further developing within the digital area and exploring new technologies, thereby leveraging efficiency, productivity and sustainability even more for its customers,” said Mr Widing. ■

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Volvo's new business area for autonomous transports

The new business area of Volvo Group - Volvo Autonomous Solutions - aims to accelerate the development, commercialisation and sales of autonomous transport solutions. It has officially started operations since 1 January 2020.

Autonomous transport solutions, based on self-driving and connectivity technologies are well-suited for applications where there is a need to move large volumes of goods and material on pre-defined routes, in repetitive flows. In such situations, autonomous transport solutions can create value for customers by contributing to improved flexibility, delivery precision and productivity.

"We have experienced a significant increase in inquiries from customers. With the Volvo Group's wide range of offerings and broad experience of different applications, we have a unique opportunity to offer solutions that meet their specific needs. It is a logical next step for us to gather expertise and resources in a new business area with profit and loss responsibility to take autonomous transport solutions to the next level," said Martin Lundstedt, president and CEO of Volvo Group.

The Group has already demonstrated a number of different autonomous transport solutions. In the Electric Site project, material handling in a quarry was



automated and electrified. The result was a safer working environment and a reduction of operator costs by 40% and of carbon dioxide emissions by 98%.

At the Brønnøy Kalk mine in Norway, autonomous Volvo FH trucks will be used in commercial operation to transport limestone along a 5-km stretch.

Another pioneering initiative is the self-driving, connected and electric vehicle Vera. In its first assignment Vera will form part of an integrated solution to transport goods from a logistics centre to a port terminal in Gothenburg, Sweden.



LEFT: Nils Jaeger, president of Volvo Autonomous Solutions.

FAR LEFT: The Electric Site project - a collaboration between Volvo CE and its customer Skanska - used the HX2 autonomous, battery-electric load carriers.

Nils Jaeger named president

Formerly president of region EMEA at Volvo Financial Services, Nils Jaeger is now president of Volvo Autonomous Solutions. He will report to Mr Lundstedt and be a member of the Group management team.

Mr Jaeger had served as president of region EMEA (Europe, Middle East and Africa) at Volvo Financial Services since 2014. Before joining the Volvo Group, he held several leading positions at John Deere.

"Nils Jaeger has extensive experience from working with total solutions for our customers. The Volvo Autonomous Solutions team will meet a growing demand and offer the best possible solutions to customers in such segments as mining, ports and transport between logistics centres, as a complement to today's products and services," said Mr Lundstedt. ■

XCMG and Cummins sign cooperation agreement

Chinese manufacturer XCMG has signed a strategic cooperation agreement with Cummins to work closely on developing and integrating comprehensive product lines, value chain and global operations, creating new applications, exploring new markets and sharing resources in the construction industry, with continuous global R&D improvement.

Cummins has been one of XCMG's most important strategic partners since the 1980s with the first electrification project in China's construction machinery industry. Since then, the two companies have gone on to collaborate in every aspect of XCMG's product lines and have achieved significant success in improving the reliability of tonnage products through technological innovation.

Steve Chapman, group VP of Cummins, said the new partnership would strive on pushing forward the technology development and industrial upgrade of the Chinese market, and Cummins will build a global application engineering team to support XCMG's overseas strategies.

Both companies will partner to develop digital and networked technologies and applications for XCMG and Cummins products and further improve equipment quality and service efficiency. They



The signing ceremony between XCMG and Cummins.

will work towards the goal of leading sustainable manufacturing with the support of intelligent manufacturing technologies.

"The global manufacturing industries are transitioning to more green, eco-friendly, efficient and emission-reducing models. I hope XCMG and Cummins will continue expanding effective supply while emphasising environmental protection, sustainable development and efficiency to make the world a better place," said Wang Min, chairman of XCMG. ■



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Construction 4.0: Bauer joins digital research project

In a project with more than 20 partners, engineers at TU Dresden (Germany) are developing new machine and communication technologies for a fully networked construction site. Within the next three years, these applications are planned to be tested on the first real-life 5G test site. Bauer Maschinen GmbH is taking part in this research project – the company is currently the only partner involved in the fields of specialist foundation engineering.

The focus of the project, which was officially launched on 1 August 2019, is the further development of construction machinery so that work tasks can be automated or partially automated. The joint project, which also involves associations such as the Deutsche Bauindustrie (German Construction Industry), VDBUM and VDMA, is being supported by a €4.8 million grant from the Federal Ministry of Education and Research. The project volume will be around €9 million, of which Bauer Maschinen GmbH will cover €620,000.

Dr Matthias Semel is coordinating and monitoring the project for Bauer Maschinen. Andreas Schober is responsible for technical implementation as subproject manager. Both work in the research and development department at Bauer Maschinen GmbH. “Digitalisation is a pressing issue in the construction industry,” said Dr Semel. “When it comes to the new opportunities that 5G will offer in the future, we want to be part of development from the very start and actively play a role in shaping it.”

Kelly drilling focus

As part of the research project - but also beyond it - Bauer will focus on the development of a drilling rig that recognises its environment and communicates data securely via interfaces. This requires the development of multiple systems as well as their implementation on a demonstrator: an environment recognition system that can recognise both process interfaces and also possible dangers, a finite-state machine that is able to automatically capture its current process data, an equipment database, an equipment management system that automatically recognises and manages tools and attachments, and an assistance system for partially automated Kelly drilling.

“We are concentrating initially on the Kelly drilling process, as this is the most common method used with our rigs worldwide,” explained Dr Semel. “The goal is for the semi-automated systems to support and assist the operator as much as possible. This ultimately has a direct effect on productivity at the construction site as well as precision and safety.”



Bauer Maschinen is taking part in a research project that will develop new machine and communication technologies for a fully networked construction site.

Assistance systems for safety and efficiency

Bauer already offers a range of assistance systems to support equipment operators – from automatic mast alignment to one-directional and bi-directional spoil discharge assistants to an adaptive Kelly speed assistant. These systems ensure greater safety, comfort and efficiency on construction sites and pave the way for autonomous drilling in an increasingly complex work environment.

The adaptive Kelly speed assistant, for example, has already proved itself in the ‘One Bangkok’ project in Thailand - covering a total area of 1.83 mil sq m, it is the largest private real estate development even undertaken in the country. For the foundation works, Thai Bauer Co Ltd installed 700 bored piles with diameters from 1,500 to 1,800 mm and a depth of up to 80 m.

Several Bauer drilling rigs were used in the One Bangkok project, including a Bauer BG 45 equipped with an adaptive Kelly speed assistant. It automatically regulates the optimal winch speed when extending and retracting the Kelly bar – a significant performance boost when it comes to operator comfort. The equipment operator monitors the complete process via a screen in the cab. If an error occurs, the assistant automatically stops the winch. Display of locking pockets in the Kelly visualisation is another advantage as it allows the wear-reducing approach of locking positions. A number of Bauer drilling rigs are now already equipped with the adaptive Kelly speed assistant. ■

New member of Bauer Group

The former Mühlhäuser-Obermann GmbH, based in Michelstadt, Germany, has been part of the Bauer Group since 1 November 2019. In the future, the company will be operating under the new name, Obermann MAT GmbH. Alexander Konz, branch manager of Bauer MAT Slurry Handling Systems - a branch company of Bauer Maschinen GmbH - is responsible for the management. “We are pleased that we can continue the location in Michelstadt and would like to give our 15 new colleagues a warm welcome to the Bauer Group.”

The company which was founded in 1974 in Odenwald has nearly 50 years of experience in specialist foundation engineering. The Obermann portfolio includes injection pumps, mixers and jet grouting pumps. “This makes it an ideal addition to our range of products,” said Timo Seidenfuss, head of sales at Bauer MAT Slurry Handling Systems. “This enables us to serve the existing market even better and also open up new markets.” The Obermann products will now be sold exclusively via Bauer MAT Slurry Handling Systems. ■



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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
18 to 19 Mar 2020	Geo Connect Asia 2020 Suntec Convention and Exhibition Centre Singapore	Montgomery Asia Email: effie@montgomeryasia.com Website: www.geoconnectasia.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.futurebuildsea.com
9 to 11 Sept 2020	Intermat ASEAN & Concrete Asia 2020 Impact Exhibition and 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
17 to 18 Nov 2020	Trenchless Asia 2020 Kuala Lumpur Convention Centre Kuala Lumpur Malaysia	Westrade Group Ltd Tel: +44 1923 723990 Email: pharwood@westrade.co.uk Website: www.trenchlessasia.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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Booth No. : BL544 Meeting-Room: N227-230

(March 10, 2020 Time:11:30-14:00)

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**Date: Tuesday, March 10, 2020 Time: 11:30-14:00
Venue: Meeting Room N227-230 (2nd Floor of North Hall)
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Caterpillar Global Operator Challenge 2019: APAC Finals

Having won the competition in their respective home countries, the 30 contestants from Southeast Asia (consisting of Indonesia, the Philippines and Thailand), China and Japan battled it out once again at the Global Operator Challenge Asia Pacific Finals. The event took place between 19 and 21 November 2019 at the Chichibu D-Tech Centre in Saitama Prefecture, Japan. It saw over 200 people in attendance, including customers, dealers, media and Caterpillar personnel, while over 1.2 million people watched the live broadcast of the China competition online alone.

After three days of intensive competition on the 320 and 336 Next Generation Cat excavators, the 950M Z medium wheel loader, the 308 Next Generation mini excavator, the contestants proved their mettle and stood up to the challenges that tested their operational agility, mental toughness, and skills in using integrated technologies to enhance machine performance.

“I had the privilege of assessing operators from Southeast Asia, China and Japan in the Global Operator Challenge Asia Pacific Finals. The competitive spirit of the operators was very apparent. With so much at stake, the contestants showed their determination to win by taking the challenges very seriously,” said Carl Thomsen,



Winners of the Caterpillar Global Operator Challenge Asia Pacific Finals on stage with the guests of honour.



The 30 contestants from Southeast Asia (Indonesia, Thailand and the Philippines) recently had to compete once again with contestants from China and Japan at the Asia Pacific Finals.

TOP AND ABOVE: The contestants stood up to the challenges that tested their operational agility, mental toughness, and skills in using integrated technologies to enhance machine performance.

Caterpillar’s senior product demonstrator instructor, who was at Chichibu to judge and score the Asia Pacific Finals. “All I can say is, look out Las Vegas, because we are sending three very determined professional operators your way!”

The three winners of the Global Operator Challenge Asia Pacific Finals are: Wilfren Jimenez from Luzon, the Philippines; Congxin Xu from Jiangsu Province, China; and Hiroyuki Harada from Niigata Prefecture, Japan. They will now form the ‘dream team’ to represent Asia Pacific at the Global Operator Challenge Finals in Las Vegas during Conexpo-Con/Agg in March 2020, where they will pit their skills against the other contestants from North and South America, and Europe.

“This is the first time that the challenge has gone global to include the Americas, Europe and Asia Pacific,” said John Fallows, Caterpillar’s general manager of sales and marketing for Asia Pacific and China. “We hope this global event can go a long way in helping tackle the talent shortage of skilled operators around the world, including in China, by promoting the cultivation of highly skilled technical talent and attracting more people to join this industry.” ■

Website: www.cat.com/en_ID/campaigns/awareness/operator-challenge.html

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Inaugural Geo Connect Asia to be held in Singapore

The newly launched Geo Connect Asia - Southeast Asia's first geospatial technologies and location intelligence solutions event - will be held from 18 to 19 March 2020 at the Suntec Convention Centre in Singapore. Organised by Montgomery Asia, the event aims to support and bring together the rapidly growing ASEAN geospatial industry.

Geo Connect Asia 2020 is set to draw over 2,000 professional visitors from the region and beyond. It will comprise an exhibition as well as a conference and technical seminars. Geospatial data expert Ng Siau Yong, chief data officer at the Singapore Land Authority (SLA), will be a moderator at the conference, bringing valuable expertise on geospatial information governance, infrastructure and technology development, capacity building, and the use of geospatial systems in data analytics.

The global geospatial market is estimated to be worth US\$134 billion by 2025, with the Asia Pacific region in particular expected to post the highest growth rates. This growth will be driven by the anticipated high demand for geospatial technologies as governments in the ASEAN region continue to invest in new infrastructure and other 'smart' initiatives, such as the ASEAN Smart Cities Initiative.

In Singapore alone, the nascent geospatial industry is currently valued at about S\$500 million and geospatial adoption has become an important and critical component in the development and evolution of ASEAN's infrastructure and industry. Indeed, geospatial investment will be essential to achieve the promises of the 4th industrial revolution (Industry 4.0).

Geo Connect Asia 2020 is supported by GeoWorks, an industry centre set up by SLA, under the Singapore Geospatial Master Plan to bring together geospatial businesses, sectoral users, research institutions and the government to foster a vibrant geospatial ecosystem in Singapore.

Conference

The conference will feature various industry verticals such as asset management, building & construction, precision agriculture, forestry, mining, transportation & mobility, distribution & logistics, and smart cities. Themed 'Mapping the Data-driven Future Economy', the content will be thought leadership-focused with data, artificial intelligence (AI) and the latest technologies at the forefront of discussions.

Speaking at the conference, seminars and plenary sessions will be a number of government officials and business leaders from the geospatial industry, including keynote speaker Dr James Crawford, CEO of California-based geospatial analytics giant Orbital Insight.

Offering his insight on the growing importance of geospatial technology across business and government, Dr Crawford said, "Today it is ever more imperative to help the world understand what is happening on and to the earth, with the increase in natural disasters, supply chain and manufacturing disruptions, national security threats and shifts in populations and construction demands. All industries and government can improve their decision-making process using real-time and multi-source geospatial data."

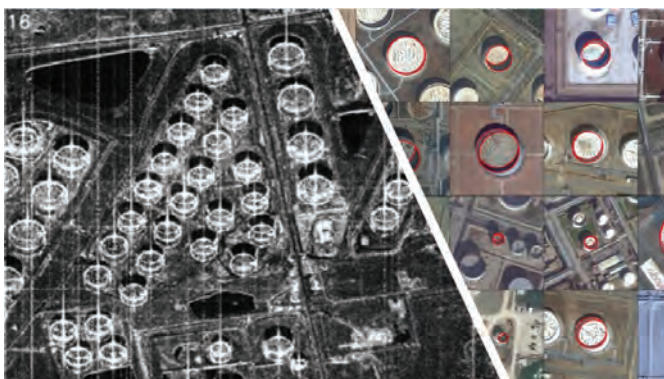
Exhibition

The exhibition will be themed 'Global Solutions for Asia's Geospatial and Location Intelligence Markets'. More than 60 international



ABOVE: Trimble will participate at the Geo Connect Asia in Singapore.

BELOW: Orbital Insight's technology translates raw optical and radar satellite data along with millions of GPS signals into actionable intelligence.



exhibitors from Australia, Asia, Europe and North America are expected to be in attendance.

According to the organiser, industry leaders already confirmed for the event include Trimble (platinum sponsor), Vexcel Imaging GmbH and Orbital Insight. Some of the novel technologies on show will include AR/VR, digital terrain analysis, earth observation & satellite, instrumentation & automation, LiDAR, photogrammetry & remote surveys, remote sensing, topographic surveys, and many more.

"Geo Connect Asia 2020 is coming at the right moment for the fast developing Southeast Asia region and there is a tremendous need for the benefits Asia's geospatial and location intelligence industry can bring. Governments and companies are recognising this and we are delighted to be a part of this event," said John Whitehead, APAC director of sales and distribution at Trimble.

To help bring together the growing industry and build bridges between ASEAN's diverse markets, Geo Connect Asia 2020 has also appointed a group of captains of industry as its distinguished ambassadors. Among these experts are Ng Siau Yong, director of Geospatial and Data Division and chief data officer at SLA; Lanita Idrus, publisher of Asia Miner; Dan Schirren, head of business development at Ordnance Survey; John Whitehead, director of sales and distribution APAC at Trimble's Geospatial Division; and Jan Schoderer, sales director APAC at Vexcel Imaging GmbH. ■

Website: www.geoconnectasia.com

Conexpo partners with women in construction groups

To highlight women as a viable force of the construction industry, Conexpo-Con/Agg has formed a partnership with two women in construction-focused associations: National Association of Women in Construction (NAWIC), and Women of Asphalt (WOFA).

“As the largest construction industry-focused trade show in North America, Conexpo-Con/Agg seeks to draw attention to and celebrate the important role women play in the industry,” said Dana Wuesthoff, vice president of expositions and event services at Association of Equipment Manufacturers (AEM) and show director of Conexpo-Con/Agg. “Working together, Conexpo-Con/Agg, NAWIC and WOFA, will not only showcase women industry leaders, but reinforce the career growth potential for women, who today represent a small percentage of the workforce and the opportunity to diversify the industry.”



The three organisations plan to pool their collective influence to sponsor and engage in education and other events at the show, running from 10 to 14 March 2020 in Las Vegas. The partnership will kick-off on Wednesday (11 March) with a breakfast event – Genders on the Jobsite. Special guests Vicki O’Leary, founder of Be That One Guy and Lorein Barlow, director and producer of Hard Hatted Women will have a candid discussion on how women experience jobsite opportunities and challenges and explore how everyone has

a role in keeping job sites productive and safe for all workers.

“According to a Bureau of Labour Statistics survey, women make up only 9% of the total workers in construction,” said Chrissy Ingram, executive administrator of NAWIC National. “As our industry continues to grapple with a labour shortage, women are poised to help play a greater role in all areas of construction. By teaming with Conexpo-Con/Agg, organisations like NAWIC and WOFA can help women thrive in a male-dominated industry.”

“Our industry and our companies all benefit from a diverse workforce,” said Amy Miller, P.E., president of WOFA. “Through Women of Asphalt, we are looking to fulfill industry workforce needs by engaging with women at schools, through our podcast, and in-person events to show them all they can achieve with a career in the asphalt industry.” ■

Website: www.conexpoconagg.com

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IPAF adds new board members

Two new members have been seconded to the board of the International Powered Access Federation (IPAF), Ben Hirst and Julie Houston Smyth. Both of them are now joining Riwal CEO Pedro Torres, who was seconded earlier.

Ms Smyth, director at Lolex Ltd, and Mr Hirst, managing director of Horizon Platforms, bolster the IPAF board following a number of changes across the past 18 months. The additions mean the number of people around the Federation's boardroom table now stands at 10.

"With almost 1,500 members around the world now, IPAF is truly an international organisation. We warmly welcome Ben, Julie and Pedro to the board, as each brings valuable knowledge and experience that will greatly benefit the Federation as we plot our course for the next several years and beyond," said Norty Turner, IPAF's president.

"All of them are powered access specialists, with their own unique expertise of the sector garnered over many years working in the industry. Each has been involved with IPAF, dedicating their time and expertise to the cause for many years now, and we will benefit even further from their acumen as they will be part of setting the direction and strategy of IPAF as board members."

Mr Hirst is the founder and managing director of UK-based Horizon Platforms, based in Wakefield, West Yorkshire, and has been actively involved with the UK Country Council (UKCC), of which he is currently vice chair, and various working groups for a number of years. In that time, he helped IPAF develop its robust standards of safety and technical guidance and assisted in the implementation of the UKCC's decision to mandate IPAF Rental+ minimum standards for all UK hirer members between 2017 and September 2019.

"I've been involved with IPAF for more than a decade now; it's an incredibly worthwhile organisation helping make our industry safer and ensuring people go home safely at the end of the day after operating MEWPs or MCWPs to work at height. When the chance came to step up and become a member of the IPAF board, it was a real honour. I look forward to working with my energetic and enthusiastic colleagues to further the Federation's aims and ambitions, especially in providing insight into the challenges faced by SME providers of access services," said Mr Hirst.



Ben Hirst (on the left) and Julie Houston Smyth.

Ms Smyth has 25 years' industry experience in powered access as a director of Highway Plant Co Ltd in Belfast, Northern Ireland. In 2019 she embarked on a new venture, Lolex Ltd, a specialist independent service, maintenance and consultancy firm.

As well as involvement in the IPAF UK Country Council & the International Council, for the past nine years, as chair of the IPAF Irish Council, Ms Smyth steered it from its original formation of a few members to a fully elected and constituted 12-person body representing all members in Northern Ireland and the Republic of Ireland.

"It is a real honour to have been offered this opportunity. I'm excited to be joining the board of the Federation and look forward to making a difference in the future of the wider powered access industry. I hope that every IPAF member – particularly the smaller companies – will feel they are represented on this board," said Ms Smyth.

Mr Torres, who took over from Mr Turner at Riwal after the latter returned to the US to take up his current position at United Rentals, was seconded to the IPAF board in mid 2019 at a meeting in Toronto, Canada, and will be confirmed along with the other appointees at the next IPAF AGM.

"Stepping up to the board of IPAF was a privilege; our newly reconstituted board is as representative of the wider powered access industry worldwide as we could possibly hope – with an immense amount of knowledge, expertise and passion for safety in powered access," said Mr Torres. ■

IPAF appoints global technical standards development expert



Daniel J (Dan) Moss (left) has been appointed by IPAF as its global technical standards development expert. He will assist the Federation in development work on new and existing MEWP safety and performance standards, including International (ISO) and US (ANSI/SAIA).

Mr Moss joins from the Association of Equipment Manufacturers (AEM), where he served for 19 years, most recently as technical consultant – standards & safety services, in which he managed MEWP-related and rough-terrain forklift truck product committees and facilitated much of the AEM's national/international standards work.

In his new role, Mr Moss will be based near Chicago in the US, reporting to Andrew Delahunt, IPAF director of technical & safety. "Being active in the access industry for more than 30 years, I plan to use my industry knowledge and global contacts to influence others in the industry to work towards the harmonisation of global and regional standards for MEWPs," said Mr Moss.

Mr Delahunt commented, "We're delighted to welcome Dan on board. Dan has provided a pivotal service to the access industry for many years – the continuous improvement of standards is crucial. There's a lot of time spent in the back office to shape technical standards into a useful guide for operators and supervisors. I'm happy to say Dan will also continue to serve on the ISO and national committees." ■

Effective date for ANSI A92 standards moved to March

IPAF is advising that there has been a revision to the effective date for the ANSI A92 suite of standards, which has been moved by the ASC A92 Main Committee from December 2019 to 1 March 2020. The change means the complete suite of standards (including: ANSI/SAIA A92.20 – 2018 | Design, Calculations, Safety Requirements, and Test Methods for Mobile Elevating Work Platforms (MEWPs); ANSI/SAIA A92.22 – 2018 | Safe Use of MEWPs; and ANSI/SAIA A92.24 – 2018 | Training Requirements for the Use, Operation, Inspection, Testing, and Maintenance of MEWPs) will now come into effect three months later than anticipated.

A decision by the ANSI Board of Standards Review (BSR) regarding appeals submitted on ANSI/SAIA A92.20 and A92.22 resulted in a limited revision on language that violated the ANSI Commercial Terms Policy. These limited revisions were balloted and approved by the ASC A92 Main Committee and were out for public comment until 10 November 2019.

Following the close of the public comment period, the ASC A92 Main Committee would go through a 30-day recirculation ballot and a 30-day appeals period before submitting the final proposal to ANSI. Once the ANSI BSR has received the final submittal, the appellants would have an additional 15 days to submit an appeal to the ANSI BSR.

The ASC A92 Committee, and the A92 Chairmen would continue

working with both appellants during this process. Actions being taken in an attempt to resolve the continued issues include forming a Commercial Terms Violation ad hoc, providing more guidance on the ANSI Lack of Dominance Policy, instituting additional policies and procedures for the A92 subcommittees, adding three licenses agreements on the SAIA Manual of Responsibilities (MoR), and reporting on A92 Standards and MoRs financials.

Tony Groat, IPAF's North America regional manager, who also sits on all three of the ANSI committees said, "While the effective date of the standards has now been extended by three months, IPAF advises all powered access stakeholders in the US to continue to familiarise themselves with the key changes and requirements in the proposed new standards, with a view to achieve compliance as soon as practicable ahead of the effective date.

"The new standards promote the safe use of MEWPs, outlining responsibilities and including new requirements for both operator and supervisor training, and so it makes sense to start implementing your requirements as defined in the new standards to ensure all involved with powered access operations are working safely and are compliant with requirements in the standards. IPAF can assist with understanding the key changes in the new standards and help you plan to be compliant in time for the effective date." ■

Website: www.ipaf.org

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Comansa introduces new flat-top tower cranes

The new Comansa 21CM750 flat-top crane offers two maximum capacities - 37.5 t and 50 t - with a jib length of 80 m, freestanding height of 78.8 m and 110 kW lifting power. It has a jib tip capacity of 7,300 kg (37.5 t) and 6,700 kg (50 t).

This new crane is currently the largest model to be manufactured at Comansa's plant in Hangzhou, China, designed to meet the needs of Asian market - which is increasingly demanding for large-capacity cranes. According to Comansa, the crane will also be distributed in South America, the Middle East and Africa.

The 21CM750 is ideal for use in prefabricated construction projects as well as construction of power plants, mining, bridges and other large-scale infrastructures. The crane features high flexibility, as the 37.5 t model can be converted into a 50 t model by changing the front trolley and hooks.

The 21CM750 shares several jib sections with the 2100 series. Thanks to the modular design, the jib and counter-jib sections of the 21CM750 provide six different configurations so that it can be adapted to different jobsite conditions.

Other features of the 21CM750 include the Cube cab and the double trolley system with an automatic changing function to optimise the load chart. The crane meets the EN14439 European safety standard and has also received the Chinese National Type approval and TÜV SÜD certification.

In addition, the new Comansa 21LC1400 flat-top tower crane comes in two versions: 50 t and 66 t maximum capacities. The crane is expected to be



ABOVE AND LEFT: The new Comansa 21CM750 flat-top crane offers two maximum capacities, 37.5 t and 50 t. It is targeted at the Asian market, but will also be distributed in South America, the Middle East and Africa.

BOTTOM LEFT: The new Comansa 21LC1400 flat-top tower crane comes in 50 t and 66 t maximum capacities.

used mainly in infrastructure and PPVC (prefabricated prefinished volumetric construction) projects; however, it would also provide an enhanced performance in others projects that require heavy load lifting, such as those in shipyards, mining and industrial sectors.

As with Comansa's most recent developments in the 21LC family, the new 21LC1400 features a modular counterjib to significantly reduce the operating radius in small sites. A new single, highly compact trolley-hook has also been designed for the 21LC1400 - instead of a single double-trolley system, which is standard in other Comansa models - as this new crane will work mainly in projects in which maximum load capacity is required for almost every lift.

The 21LC1400 is also fitted with the Cube cab. The crane offers an 85 m jib, extendable up to 90 m and a new cage, designed as an extension of the range that includes the latest upgrades of cages previously available only for smaller cranes.

Furthermore, Comansa announced the addition of Quick Set, an electronic limitation system that reduces the set-up time of the cranes from three hours to 45 minutes. This technology, which was exhibited at bauma 2019, can also minimise the number of staff needed during operation. ■

Website: www.comansa.com



Vermeer offers new CTX160 mini skid steer

Vermeer is expanding its line of mini skid steers with the addition of the CTX160. With a rated (SAE) operating capacity (ROC) of 725.7 kg, 56.8 l/min of auxiliary hydraulic flow and a width of 106.7 cm, the machine provides high lifting capabilities while remaining compact and easy to operate.

The CTX160 can handle jobs such as moving heavy material, working ground-engaging attachments and efficiently manoeuvring in congested operating conditions - including passing through a standard gate. It is suitable for challenging landscaping, hardscaping, rental, utility and general construction work.

According to Brett Newendorp, landscape market manager at Vermeer, the mini skid steer market continues to see a demand for machines with a higher ROC, and the CTX160 provides an ideal blend of lifting performance and compact body design. "What makes the mini skid steer loader versatile and unique among tool carriers is its ability to efficiently manoeuvre where larger loaders can't," he said. "We designed the CTX160 to give contractors a class-leading ROC in a small footprint so they get the best of both worlds. Also, it helps operators stay confident in their equipment when it is built with quality and durability in mind."

The CTX160 features a vertical lift path design, with a hinge-pin dump height of 225.4 cm for efficient clearance when dumping material in to a trailer or truck. The machine is powered by a 40 hp turbocharged Kohler KDI diesel engine that does not require a diesel particulate filter (DPF), helping to reduce the cost and complexity of the engine.

With a weight of 1,814.4 kg and a 22.9 cm rubber track undercarriage, the CTX160 provides optimal traction when transporting heavy material and in harsh working environments. Its Vermeer chariot-style ride-on platform has an integrated operator presence system that disengages the loader's ground drive and attachment motion when the operator steps off the machine. The platform also provides operator comfort and visibility.

The control station on the Vermeer CTX160 includes a single, pilot-operated joystick for smooth functionality. It has a dual auxiliary system so the operator can switch between high flow for ground-engaging attachments and low flow for optimal control. Also, the unit's universal mounting plate fits a wide range of Vermeer-approved attachments. ■

Website: www.vermeer.com



The new Vermeer CTX160 mini skid steer features a rated operating capacity of 725.7 kg, 56.8 l/min of auxiliary hydraulic flow and a width of 106.7 cm. The machine provides high lifting capabilities while remaining compact and easy to operate.

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Auger Torque launches hydraulic hammer range

Auger Torque has added a full range of hammers to its product portfolio, the SB series. There are currently eight models available, designed for machines with operating weights between 0.5 t and 12 t. More models are expected to be introduced in the future.

Being a gas-type-breaker, these new SB hammers can tolerate high back pressure and are independent of oil temperatures - meaning they have a wide range of calibration when it comes to oil flow, and allow operators to use them on a multitude of host-machines for greater versatility.

The SB hammers are made of high-grade steel and consist of a simple, ingenious design with only two moving parts. They also feature a cartridge design without tie rods and are therefore extremely quiet, allowing operators to work longer hours and complete contracts in shorter time frames. A comprehensive immersion-hardened range of chisels are available, enabling use on a variety of materials from reinforced concrete, layered rock, highly compacted rock to special tools for wood cutting, pile driving and even asphalt cutting.

“What sets this range of hammers apart from other gas-type breakers is the use of a high grade ‘Freudenberg’ three lip seal – giving the user constant power output over a longer period of time, and up to 30% higher performance than oil type breakers,” explained Kelvin Hamilton, managing director of Auger Torque Australia. “The special seal gives more performance and reduces the need for nitrogen refills to a minimum, providing up to 300% higher gas tightness compared to standard seals, resulting in a simple, efficient and cost effective breaker with less downtime and less money spent on refills.”

Mr Hamilton added, “The hydraulic connections are completely encased in the body of the hammer, enabling operation in tight access situations common around suburban Australian cities, without having to worry about damaging the hydraulic hoses and the dust seal on the upper bushing of course comes as standard.” The new SB hammers are also available in Asia and globally. ■

Website: www.augertorque.com.au



ABOVE: The new SB-series hammers from Auger Torque are made of high-grade steel and consist of a simple, ingenious design with only two moving parts. These hammers can tolerate high back pressure and are independent of oil temperatures.



RIGHT: The SB hammers are ideal for machines with operating weights between 0.5 t and 12 t.

SDLG unveils biggest wheel loader

SDLG has introduced its new Stage III L975F wheel loader – the company’s biggest wheel loader to date. The machine can be used for a range of tough applications on construction sites, as well in quarries, mines and port terminals.

The 24,900-kg L975F is designed with robust rear and front frames to withstand load distribution. The machine is equipped with a large tonnage driving axle and reliable braking, making it able to handle many tasks. Fitted with a 199 kW engine, its transmission uses an HTE205C fixed-axis electro-hydraulic automatic shifting gearbox for flexibility and ease of operation - SDLG’s first machine that uses a fully automatic transmission built by Volvo. An integrated cooling system uses intelligent technology to automatically adjust fan speed according to engine temperature, which is particularly advantageous in hot climates.

The standard 4.2 cu m bucket with eight bolted on teeth and two wear plates features a spill guard plate to prevent material loss. The maximum dump height, at 3.2 m, is supported by a 3.6 m boom. The second stage 93 sand filter in the hood of the machine filters over 95% of particles when working in dusty conditions such as mines to keep the job smooth and efficient.

With efficiency in view, the L975F’s fuel consumption is halved. SDLG said that with the same material load, the L975F’s fuel consumption is almost 50% lower than that of two standard 5-t wheel loaders, saving businesses on expensive operational costs.

At 7 t, the loader faces large and heavy material moving jobs, so operational efficiency is crucial. The improved confluent hydraulics system automatically adjusts its fuel pump based on the load size, reducing overflow loss by 12% in comparison to older models. Its proprietary power matching system sets a new benchmark for energy saving.



The 24,900-kg L975F is currently the biggest wheel loader from SDLG.

Featuring a standard bucket capacity of 4.2 cu m (optional: 3.5 to 7 cu m), the machine provides an automatic lift limit, where the boom stops when reaching its highest point to avoid damage to the cylinder. The hydraulic wet brakes contain a double-circuit system to ensure reliable and safe braking where necessary. The cab features pilot dual handle control, light and flexible to operate, making unloading tasks easy and comfortable. ■

Website: www.sdlg.com

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Manitou's first electric all-terrain AWP goes to Asia

Manitou has introduced the Oxygen 200 ATJ E - the Group's first electric all-terrain aerial platform - to the Asian market. The model provides a working height of 20 m, working outreach of 11.57 m and 7.90 m up and over. It is a versatile machine ideal for indoor, outdoor and urban use thanks to its zero emission and noise cancellation capability.

The Oxygen 200 ATJ E offers improved total cost of ownership with its zero fuel consumption, enhanced onboard diagnostic and reduced preventive maintenance. Designed as a 100% electric mobile all-terrain elevating work platform, the 'Oxygen' machine aims to address the growing demand in Asia for flexible low-carbon solutions and accelerate users towards their goals of sustainability and efficiency.

The Oxygen range can be used for various applications such as cladding, framework, painting, cleaning, pruning, events, airport maintenance, port maintenance, industrial maintenance and urban worksites. The Oxygen 200 ATJ E has a 230 kg basket capacity and up to 45% gradeability. The machine is equipped with a 48 V / 460 Ah battery (lead acid) and 48 V / 60 Ah integrated charger.

The introduction of the Oxygen 200 ATJ E in Asia took place on 12 December 2019 during the inaugural showcase event at the Manitou Centre Singapore – organised by Manitou Asia. The company also displayed a wide range of aerial work platforms (AWPs) for the Asian market.

"Our AWP showcase in Asia symbolises Manitou's commitment to bringing the most state-of-the-art solutions to users in this region. Tapping upon our well-established strengths in telehandlers, our AWP innovations will offer a competitive advantage to meet evolving needs and enhance working conditions, safety and efficiency for customers in Asia," said Bernd Freudenmann, vice president of Manitou APAC.

In addition, Manitou's fleet of smart AWPs have been developed as Connected Machines to allow users to fully harness the benefits offered by Internet of Things (IoT). They can provide real-time access to machine data, remote monitoring for better service levels and maintenance data on mobile apps. This means that users can track and trace their machines, enjoy anticipative maintenance to minimise downtime and achieve higher return on investment.

The inaugural showcase event in Singapore marks another milestone in Manitou's expansion into the AWP market to better serve the construction and industrial sectors in Asia. In September 2019, the Group started the construction of a new factory dedicated to AWPs in Candé (Maine-et-Loire), France, as part of its global investment plan. To be completed by the first quarter of 2021, this new industrial facility will enable Manitou to respond to AWP market growth in various regions including Asia. ■

Website: www.manitoucenter.com.sg



RIGHT AND BELOW: The Oxygen 200 ATJ E is the first electric all-terrain aerial platform from Manitou, featuring a working height of 20 m, working outreach of 11.57 m and 7.90 m up and over.

Both images © Manitou



Bernd Freudenmann, VP of Manitou APAC, speaking at the inaugural showcase event in Singapore to introduce the Oxygen 200 ATJ E to the Asian market.

Manitowoc officially launches Potain Hup M 28-22

Manitowoc has officially launched its new Potain Hup M 28-22 at the recent Batimat exhibition, which took place in November 2019 in Paris, France. The crane was first previewed at bauma 2019 and is now receiving orders, with first deliveries expected for early 2020.

The Hup M 28-22 is the third model from the Potain Hup self-erecting crane range but the first to prioritise mobility - denoted by the M in its name. The new design of the Hup M 28-22 provides excellent compactness. The model is only 11.6 m long when folded, allowing it to work in narrow, restricted jobsites, as well as making it easy to transport from site to site.

The Hup M 28-22 also features highly advanced transport equipment with double steering axles. It has a 28 m jib and features two load charts, each with 16 configurations – which is said to be unique to this category of self-erecting cranes – enabling it to be easily adapted for a range of jobsite applications. The crane has a maximum capacity of 2.2 t and can lift 850 kg at its 28 m jib end.

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

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

The Smart Set-up software is a key asset for this new generation of self-erecting cranes, especially with the Drive Control functionality: three selectable profiles for operators that vary the working speed of the crane to suit the application. On top of that, the micro-speed function delivers slow, high-precision hoisting. New features also allow the user to steer the wheels and manage the crane's hydraulic elevation. ■

Website: www.manitowoc.com



LEFT AND RIGHT: The Hup M 28-22 is the third model from the Potain Hup self-erecting crane range, but the first to prioritise mobility. The model is only 11.6 m long when folded, allowing it to work in narrow, restricted jobsites, as well as making it easy to transport from site to site.

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Astec Mobile Screens' new Ranger compact track line

The new Ranger line of compact track-mounted equipment from Astec Mobile Screens includes a variety of jaw crushers, impact crushers, cone crushers, incline screens and trommels.

These compact units are able to serve a variety of new markets such as building and construction, landscaping, quarry operations and plant and tool hire. The ease-of-use, ease-of-transport, versatility and flexibility of compact, track-mounted units make them ideal for smaller operations that require powerful equipment with a limited footprint.

The Ranger line will be represented by a network of dealers that have the capacity to support the equipment and sustain a strong rental programme for its customers, said Astec.

"The new Ranger line will help us reach a wider range of industries and customers. The compact units are going to be a great tool for contractors, quarry operators and many more. We are remaining very focused on providing excellent support for these units, just like our other products," said Patrick Reaver, inside sales director at Astec Mobile Screens. ■

Website: www.kpijci.com



The new Ranger line of compact track-mounted equipment - including a variety of jaw crushers, impact crushers, cone crushers, incline screens and trommels - is designed to serve various sectors.

KPI adds optional pre-screen to FT4250 impactor

Kolberg-Pioneer, Inc (KPI) has added a two-deck, 4-ft x 7-ft pre-screen option to its FT4250 mobile impactor plant. This new option allows producers to scalp the feed, crush the material and post-screen all on one unit.

By pre-screening the feed, users can maximise their scalping ability and minimise the amount of undersized material passing through the chamber, reducing wear costs and increasing the

amount of final product by 30%. "Several of our customers are trying to produce products that have a significant amount of fines in the feed material. The pre-screen allows producers to remove those fines while also minimising the amount of rejected in-spec product," said Tim Harms, crushing and screening product manager at Kolberg-Pioneer. ■

Website: www.kpijci.com



ABOVE AND RIGHT: Kolberg-Pioneer has added a two-deck, 4-ft x 7-ft pre-screen option to its FT4250 mobile impactor plant.



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Three new tower crane models from Terex

The new Terex CTLH 192-12 hydraulic luffing jib tower crane offers a maximum capacity of 12 t, with a jib of up to 55 m and a tip load of up to 2.35 t. This unit features the latest hydraulic luffing technology, which allows keeping its parking radius up to 8 m and working radius up to only 3 m.

The new CTLH 192-12 can be erected with main Terex towers HD23, TS23, TS21 and H20, and is available both for freestanding and internal/external climbing configurations. The crane is equipped with the new control system that enables fast erection and easy set-up, the TPP (Terex Power Plus) and the Power Match.

According to Terex, the CTLH 192-12 will be available in January 2020. It is built to meet to the increasing demand for cranes in highly crowded jobsites and with limited working areas. This new model is also arranged for Terex's new telematics platform T-Link, which increases jobsite efficiency and reduce operational cost.

In addition, the CTT 172-8 is the latest flat-top tower crane from Terex with a maximum capacity of 8 t and a jib reaching 65 m length. The load capacity at maximum length is up to 1.71 t.

Scheduled to be available in December 2019, the CTT 172-8 is compatible with Terex towers TS16 and TS21, and is available both for freestanding and internal/external climbing configurations.

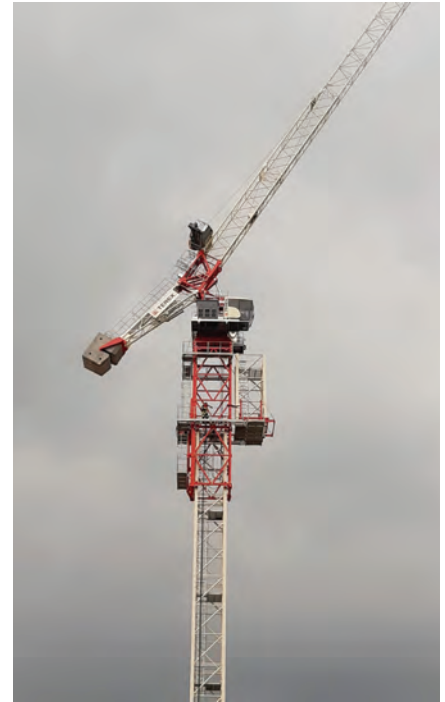
To meet the needs of different markets, the CTT 172 offers two hoist winch options: 37 kW and 22 kW. This model also features an advanced technology in terms of control system enabling fast crane set-up, TPP function, and its data can be remotely controlled by T-Link Telematics platform.

Terex revealed that the CTT 132, CTT 172 and CTT 202 are all part of the company's important city class range that offers new control system, new S-Pace cabin and additional options like the advanced Terex T-Link telematics platform.

The other new model, the CSE 32, is the first model in Terex's new generation of self-erecting tower cranes. It features a jib length of 32 m, maximum capacity of 4.4 t, maximum tip load of 1.05 t and hoist speed up to 56 m/min. The crane is expected to be available from the second quarter of 2020.

The CSE 32 is electronically controlled, with intuitive user interface, new TPP function and is ready for T-Link Telematic platform, anti-collision and zoning systems. The model is available in both CE and UL versions, and is compliant with EN14439-REV.1 safety standard. ■

Website: www.terex.com/cranes



LEFT AND RIGHT: The Terex CTLH 192-12 hydraulic luffing jib tower crane offers a maximum capacity of 12 t, with a jib of up to 55 m and a tip load of up to 2.35 t



RIGHT: The CTT 172-8 is the latest flat-top tower crane from Terex with a maximum capacity of 8 t and a jib reaching 65 m length. The load capacity at maximum length is up to 1.71 t.

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Snorkel produces A38E electric model at China facility

Snorkel has recently launched the production of the A38E electric articulated boom at its assembly facility in Jintan, Jiangsu Province, China. The company said the 3,000 sq m facility is the second manufacturing location for this model, and will supply the domestic Chinese market. The A38E is also built at Snorkel's manufacturing facility in the UK, which will continue to ship to customers worldwide.

This is the fourth model to be introduced to Snorkel's Jintan assembly facility, following the S3219E and S4732E electric slab scissors in 2017, and the Snorkel A46JE electric articulated boom lift in 2018. Subject to demand, Snorkel will introduce additional product lines in the future as required to support domestic customers in China.

The new China-built A38E articulated boom was recently introduced at the APEX Asia exhibition in Shanghai, which was held in October 2019. Snorkel's A-series articulating boom lifts combine excellent manoeuvrability with clean and quiet operation, delivering working heights of up to 16 m from zero emission, battery-powered machines.

Lightweight but durable and reliable, the Snorkel A38E offers a working height of up to 13.5 m and up to 6.1 m of outreach. The up-and-over articulated/telescopic boom design provides the operator with a superb working envelope, and now features powered platform rotation and Snorkel Guard secondary guarding as standard.

Other Snorkel innovations

Capable of working to heights up to 16 m, the two-wheel drive Snorkel A46JE is a battery-electric version of the A46JRT. With a working outreach of 7.35 m and a jib length of 1.5 m, this self-propelled boom is a highly versatile performer. The spacious platform (1.83 m x 1.0 m) can lift two people with tools, while offering powered 160-degree rotation.

The Snorkel S4732E is the largest lift in its family of electric slab scissor lifts. Weighing in at 2,693 kg, the Snorkel S4732E can lift 350 kg to a working height of 11.8 m and features a 1.21 m roll-out extension deck for additional reach.

In addition, the S3970RT is the largest in the line of compact diesel-powered rough terrain scissor lifts from Snorkel. Offering



The A38E electric articulated boom lift.

a maximum working height of 13.8 m, the Snorkel S3970RT has a lift capacity of 350 kg from a chassis that is 1.8 m wide. Its narrow dimensions and roll-out deck extension are ideal for outdoor work in confined spaces. With four-wheel drive to tackle rough terrain with ease, the S3970RT is also equipped with outriggers as standard for the ultimate versatility. ■

Website: www.snorkellifts.com



FAR LEFT:
The A46JE
electric
articulated
boom lift.

MIDDLE:
The S4732E
electric slab
scissor lift.

LEFT: The
S3970RT
diesel-
powered
rough
terrain
scissor lift.

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Sandvik's Dino DC410Ri surface top hammer drill rig

The latest Dino DC410Ri surface top hammer drill rig from Sandvik Mining and Technology is a major all-around upgrade from its predecessor, Dino DC400Ri - which was originally launched in 2014. A compact machine for 51- to 76-mm hole sizes, the new model continues to offer mobility and stability for contractors tackling cramped urban construction sites, as well as for demanding quarry and infrastructure applications. The remote radio control, 14-kW RD414 rock drill, advanced i-series torque control system and up to 18 sq m coverage area add up to a cost-effective and productive solution for demanding jobs.

While retaining the basic design of the original machine, the new Dino DC410Ri features a number of significant upgrades for improved reliability. Its entirely new electrical system responds to challenges with components such as I/O boards. Several mechanical details have been reinforced, including a steel-framed tramming support for the feed beam and ruggedised rod-handler arms.

The upgraded Dino DC410Ri also offers enhanced mobility, thanks to 15% higher tramming power compared with the previous model. Other features contributing to excellent mobility include low tramming height, low centre of gravity and high ground clearance.

In addition, a range of new options are available for Dino DC410Ri, creating even more possibilities to customise the rig for various applications. The NoiseShield-DC is a simple and compact noise-reduction solution, offering up to a -7.5 dB reduction in A-weighted sound pressure within a 16-m radius of the drill rig. The isolation panels of this system are easy and quick to install simply by replacing the standard mesh panels of the safety cage.

Contractors aiming for minimum set-up times can select the feed auto-aligning option, which maintains the alignment of the feed beam at the preset angle even if the position of the boom changes from one hole to the next. Water flushing can be a useful option for applications requiring optimal dust suppression, such as tunnelling jobs.

A tangible improvement likely to be appreciated by many operators is the new remote-control unit. It has redesigned joysticks for easier handling with work gloves on, the plastic wiring connectors have been replaced with metallic military-



TOP AND ABOVE: The new Dino DC410Ri surface top hammer drill rig is designed for 51- to 76-mm hole sizes. It offers mobility and stability for contractors tackling cramped urban construction sites, as well as for demanding quarry and infrastructure applications.

grade components, and the control unit is better protected against moisture leaks in tough, cold environments.

Another practical feature is the possibility to duplicate the drilling control display on an Android phone or tablet. The remote screen, attached to the remote-

control unit, gives an excellent view of the drill rig alignment and displays the drilling and tramming parameters for easy and accurate control, even if the rig itself is on the bottom of a deep trench or close to the edge of a hazardous bench. ■

Website: www.rocktechnology.sandvik

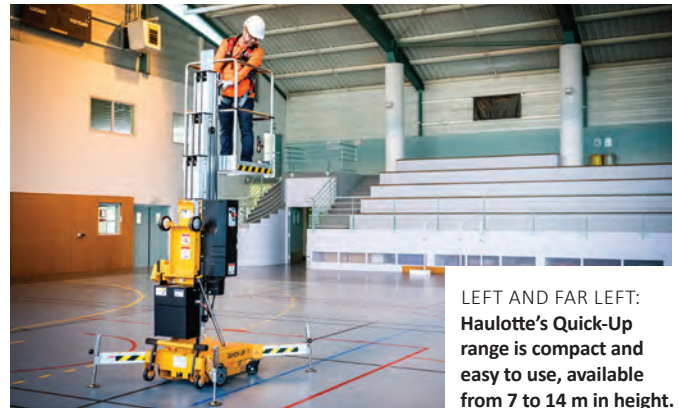
Haulotte's Quick-Up range

Haulotte's Quick-Up range is compact and easy to use. Available from 7 to 14 m in height, these electric lifts offer high manoeuvrability in tight spaces and are adapted for a wide range of indoor applications.

Push-arounds are versatile aerial work platforms suited for delicate flooring. Their lightweight design makes manoeuvring simple, and their non-marking tyres are ideal for all types of floor surfaces. The machines' stabilisers are equipped with rubber to protect the floor surface.

The Haulotte Quick-Up lifts are easily transportable, even in a van, and they can be set up by one person within minutes. Their compact design enables them to go through doors and elevators. In addition, the Quick-Up range is fitted with intuitive controls so that operators can elevate quickly. Its mast architecture provides optimal stability, while its four stabilisers allow technicians to work at height with confidence. Both AC and DC versions require minimal maintenance. ■

Website: www.haulotte.com



LEFT AND FAR LEFT: Haulotte's Quick-Up range is compact and easy to use, available from 7 to 14 m in height.

Goldhofer

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 - remote control



MADE FOR YOUR MISSION

Volvo EC200D delivers fuel savings in Indonesian quarry

Indonesian quarry company CV Putra Kartini previously rented machines to support its sand quarry operations in Lumajang, East Java, Indonesia. After discovering that the EC200D excavator from Volvo Construction Equipment (Volvo CE) offers a high swing torque and unique lifting capabilities, CV Putra Kartini decided to purchase the 20-t excavator.

“This is the first Volvo CE machine we own. At our sand quarry, we need speed and fuel efficiency, which is exactly what the EC200D delivers for us,” said Ahmad Alfandi, director of CV Putra Kartini. “Previously the machine I was using used up 20 l/hr. After switching to Volvo CE, it has dropped to 15 l/hr. This greatly reduces my fuel consumption and I am able to see at least 25% fuel savings with Volvo CE.”

Deployed in September 2018, the EC200D works about 12 hours a day, six days a week, digging and loading sand on to trucks. On average, the excavator loads about 50 trucks of sand daily and has currently worked a total of around 3,000 hours.

Mr Alfandi noted that his operators love using the EC200D for its easy operation and comfortable cabin. “The EC200D is extremely easy to control and the superior stability ensures smooth and efficient operation of the machine,” said Fuad, a machine operator at CV Putra Kartini.

The EC200D provides a maximum breakout force of 116 kN and a bucket capacity of 0.8 cu m. It is equipped with a fuel-efficient Volvo D5E Tier 3 engine featuring 123 kW of power at 2,000 rpm, and strong hydraulics. The machine is designed to operate fast and with short cycle times. It is also well balanced, resulting in exceptionally good loading capabilities.

Established in September 2017, CV Putra Kartini primarily focuses on sand quarry operations. Headquartered in Lumajang, East Java of Indonesia, the company owns one sand quarry with an exploration permit of 85,000 sq m.

CV Putra Kartini purchased the EC200D from PT Indotruck Utama, one of Volvo CE’s distribution partners in Indonesia. “We appreciate PT Indotruck Utama’s support in selecting the ideal excavator for us and for ensuring we receive top-quality aftermarket service. Their response is exceptionally fast and the spare parts are reasonably priced,” said Mr Alfandi. ■

Website: www.volvoce.com



ALL IMAGES: CV Putra Kartini is using a Volvo EC200D excavator for its quarry operations. The machine offers a high swing torque and unique lifting capabilities, and is powered by a fuel-efficient Volvo D5E Tier 3 engine featuring 123 kW of power at 2,000 rpm.

Ammann ABA 320 plant key to new district in China

Lanzhou New District in China is reportedly a city that is essentially being built from scratch. It will be 49 km long and 23 km wide when fully constructed a decade from now. "It is a long and large project – the biggest national new district in China," said Ma Shengjun of Gansu Road & Bridge Maintenance Corp.

The development of the district, the fifth in China, is significant to the country's future. "It is the important connection point between the Silk Road Economic Belt and the Eurasian continental bridge," said Mr Shengjun. The Silk Road Economic Belt is one component of the larger Belt and Road Initiative, an enormous nationwide infrastructure development project.

An Ammann ABA 320 UniBatch asphalt plant has been commissioned to produce asphalt for all elements of the district's infrastructure. The unit will operate almost continuously over the next decade to supply the needed asphalt mix. It has a production capacity of 320 t per hour.

"The project is to build a bridgehead for the development of the western region, and to build a modern, small-scale city on the Silk Road," explained Mr Shengjun. "This makes the district an important economic growth point in northwest China – a key industrial base for the country. It is also an important strategic platform opening to the west."

The Lanzhou area is said to be mostly undeveloped and the few asphalt plants there or nearby are low-cost, domestic alternatives that offer limited technology and production.

The highly advanced ABA UniBatch is a major improvement from these plants. "This is hard to imagine in northwest China," said Mr Shengjun. The purchase of the plant "shocked the market."

The ABA UniBatch's green features were the key factor in the purchase. The Chinese government has dictated that emissions be minimised and other sustainable efforts taken – including covering the entire plant to lessen dust, reduce sound and provide aesthetic appeal.

"Gansu Road & Bridge chose the Ammann plant, which is famous for its environmental protection, high efficiency and stability," said Mr Shengjun.

ABA UniBatch plants utilise an exceptionally efficient drying and heating process that conserves energy and ultimately reduces costs. The burner



ABOVE AND LEFT: The Ammann ABA 320 UniBatch asphalt plant (above), located inside a factory, is working on a new district development in China. The unit is expected to operate almost continuously over the next decade.



Rendering of the new district in China.

control regulates the drying process to ensure reduced fuel consumption and low emissions. The proprietary as1 Control System also adds efficiency – and makes plant operation intuitive, too.

Plant management can choose the most cost-effective fuel options including natural gas, light fuel oil, heavy fuel oil and

LPG. Fume and noise mitigation systems are available, as is full cladding – an option chosen by Gansu.

"The plant has become the highest standard in northwest China," said Mr Shengjun. "It will have an impact on the country." ■

Website: www.ammann.com

Carmix 3.5 TT helps build ‘Lego’ concrete blocks

Garten Richter GmbH is a family-owned company from Glashuetten, Germany, which has been active in the landscaping and horticulture industry for over 40 years. The company uses a variety of machines, including Carmix, to carry out various construction projects like infrastructure, terraces, fences, natural pools, walls, concrete work, and others.

Recently, Garten Richter deployed a Carmix mobile concrete batching plant to work on a special project, building concrete blocks measuring 180 x 60 x 60 cm in the shape of Lego bricks with recycled material. The job was completed in April 2019.

For this project, Garten Richter was looking for a machine that could produce small quantities of concrete at given times, using custom materials and recipes. The company finally found that only Carmix machines were able to output a continuous and uniform concrete mix directly on site, without using any other equipment.

Garten Richter then ordered a Carmix 3.5 TT from Hedke GmbH, Carmix’s dealer in Germany. This small mobile concrete batching plant proved excellent for producing Lego concrete blocks, allowing Garten Richter to easily build compartments for different aggregates and at the same time to optimise site management and material organisation.

Carmix machines provide many benefits, such as reducing concrete costs in comparison to existing mixing methods, offering a greater capacity than screw mixers combined with tractors or other mini-loader machines, and also simplifying the mixing and unloading phases for higher efficiency. In one working cycle, the Carmix 3.5 TT chosen by Garten Richter could produce concrete for five cement blocks, whose mixture is composed of 5,580 kg of recycled material sized 1 to 12 mm, 410 l of water and 920 kg of cement, to a final concrete resistance of C25/3 kp.

“It was the right choice, we are going to use Carmix for many other future projects,” said Klaus Richter, owner of Garten Richter GmbH. The company plans to use the Carmix 3.5 TT to offer its external customers small concrete bricks made of standard aggregates according to predefined recipes. All of this is made possible by the machine’s efficient electronic weighing system and concrete-mate, the digital mix design manager.



ALL IMAGES: Garten Richter has selected a Carmix 3.5 TT mobile concrete batching plant to help build concrete blocks (measuring 180 x 60 x 60 cm) in the shape of Lego bricks with recycled material.



The Carmix 3.5 TT will also be used to produce concrete directly on construction sites outside Germany and to manufacture lean concrete. This machine is easy to transport by truck or small trailers. It is also

ideal for use in small or private projects, such as swimming pools, canopies or for the laying of stones, where a standardised, certified mix is not required. ■

Website: www.carmix.com

Indeco ISS 10/20 shears join renovation project in Italy

Stogit, a subsidiary of Snam, is performing a renovation project at the gas storage facility in Minerbio outside Bologna, Italy. The company manages nine facilities and operates in synergy with other transport and regasification infrastructures, contributing significantly towards the country's energy safety. The storage system is critically important because it equalises the supply and consumption of gas, and to that end, Stogit places special attention on the safety and efficiency of its facilities.

The project at the Minerbio facility involves three phases, but the first part currently under way provides that the pertinent areas be restored to 'greenfield' status in order to prepare them for subsequent works and to increase the space available inside the facility. The works entail the total demolition and removal of the plants, above-ground structures, piping (underground and on the surface) and the reinforced concrete bases of the two turbo compressors that had reached the end of their working life so that they could be replaced with a larger, more powerful one with an upgraded design and that delivered greater efficiency.

Stogit assigned the dismantling of the two turbo compressors to Sicilsaldo/Nuova Ghizzoni, specialised contractor in the oil industry and active in the construction of gas pipelines and plants, industrial assembles, and in the civil and international market, having completed important projects in Tunisia, Kuwait and Algeria.

For the Minerbio storage facility project, Sicilsaldo/Nuova Ghizzoni decided to purchase Indeco ISS 10/20 shears. Luca Di Vita, who represents the company at Stogit and is also the construction site manager, said the size of the equipment and its power were a determining factor: "As always, and that goes for this project too, we measured the use of resources and evaluated all aspects of the contract, so that we were able to comply with the specifications and the timeframe of the tender. Because the gas storage facility is in operation, we had to be very careful when choosing the method of using the machinery and equipment and the areas where they would be operation, taking the strict safety criteria into particular consideration.

"The choice of moderately small shears was prompted by the need to operate within the assigned areas, all relatively small. Larger shears would have implied using an excavator with a higher weight, which would have compromised mobility during the phases to dismantle the turbo compressors and, in the long run, also productivity. The high concentration of service roads and footpaths within the site would have also limited the space available for the phase where the various structural elements and components of the plant would be further cut to allow them to be hauled away for recycling."

Mr Di Vita continued, "Though the ISS 10/20 was in some way undersized with respect to the larger structural elements, it demonstrated great productivity and an exceptional cutting ability, but also allowed us to greatly limit manual work, an advantage that significantly influenced the speed and especially the safety of all phases of the demolition."

The ISS 10/20 shears are the smallest of the six making up the Indeco range, and with their 2,400 kg of operating weight and maximum clamping force at tip of 120 t they feature an exceptional weight to power ratio. This attachment with its robust chassis entirely built in extra-strength Hardox has a dual guide system that keeps the jaws perfectly aligned to prevent buckling during the cutting stroke. The double regeneration valve speeds up the



ALL IMAGES: Indeco ISS 10/20 shears being deployed on a renovation project at the gas storage facility in Minerbio outside Bologna, Italy.

movement of the jaws (accelerating opening and closing and thus improving productivity), whereas the dual piercing system in both the upper and lower tip makes for a clean, gradual cut. ■

Website: www.indeco.it

INTO THE WOODS

HOW A RESURGENCE IN TIMBER COULD REDEFINE THE CONSTRUCTION INDUSTRY

By: *Serena Yap, technical director and built environment leader at Aurecon in Singapore*

The rise of mass engineered timber (MET) has ushered in a new era of building with wood, with exciting possibilities to design structures of unprecedented complexity and scale. But what's most exciting about the new age of timber is what it could mean for the industry in terms of sustainability and automation.

One interesting aspect to our 'age of disruption' is the perception that a business or product that 'disrupts' is completely new: new model, new thinking, new ways of operating. And while that perception is valid for some 'disruptions', it doesn't apply to all. So, is it time to disrupt how we look at disruption?

In the world of construction, we are currently living through something of a 19-century gold rush: only this time we're not heading to the wilds in search of precious metals, but something far more prosaic - wood. Timber has the potential to be one of the most significant disruptors to our industry in recent years even though it's one of the oldest construction materials known to man.

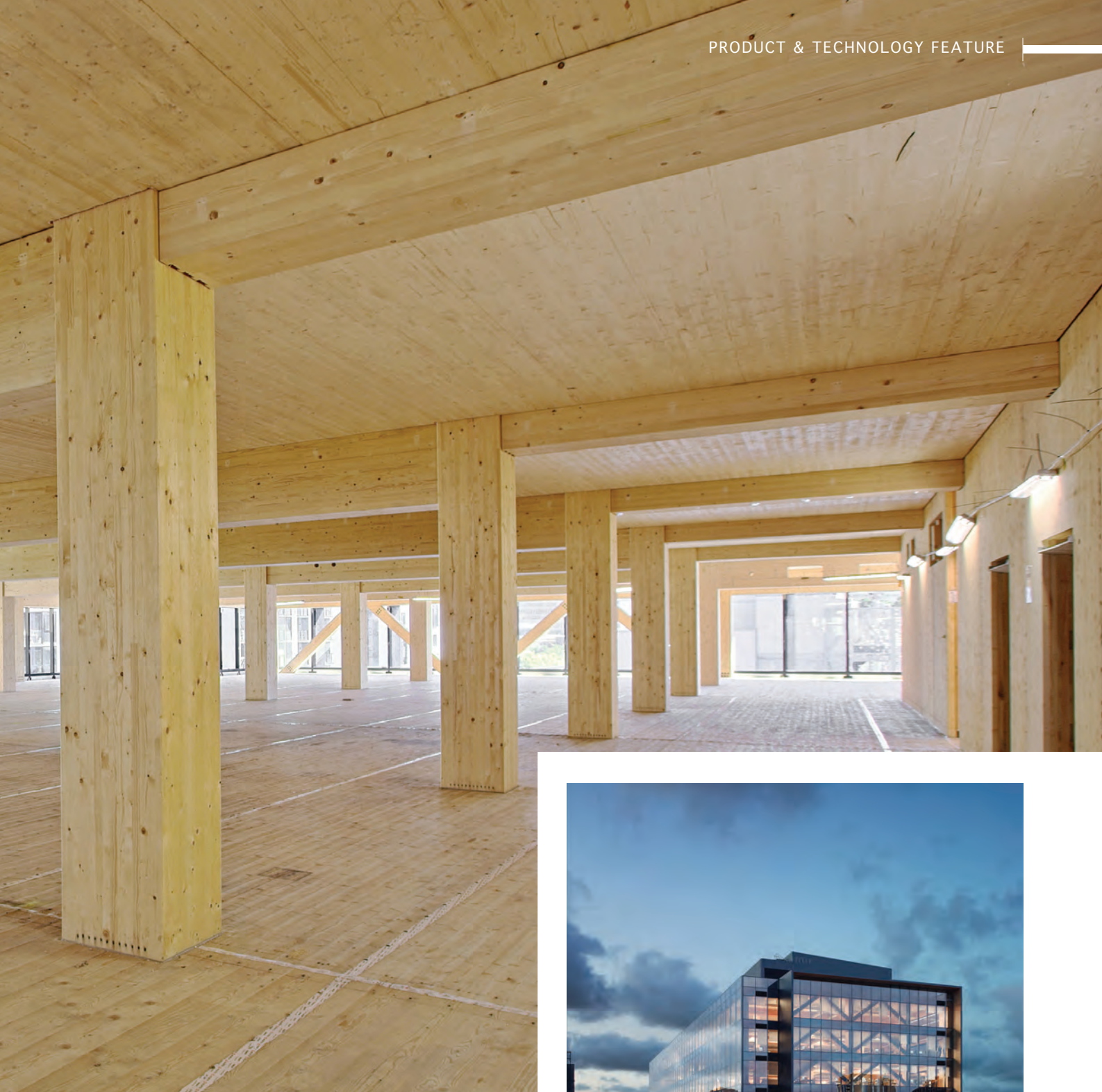
This paradox goes against what many would think of as disruption, but the revolution in timber construction is real; and what's more we're just at the beginning. As professor Clayton Christensen of Harvard Business School noted, disruptors come

from below and at Aurecon that's how we feel about the modern reincarnation of timber construction.

MET projects in Asia Pacific

Timber buildings are on the rise: in just the past couple of years Aurecon has worked on a number of significant projects in Asia Pacific, for commercial, educational, and sports use. One is Asia's largest timber building, currently taking shape at the Nanyang Technological University (NTU) in Singapore.

The other project is 25 King Street in Brisbane, Australia, which at 52 m was the tallest timber tower of its type when it completed in 2018. The tallest timber building of any type was also completed in 2019, the 84.5 m tall Mjøstårnet in Norway. Combined with the rising number of new and ambitious timber projects being planned, it's clear the world of timber construction is advancing.



We believe the MET used in construction today has the potential to disrupt the construction industry in much the same way plastic transformed the manufacturing industry in the early 1900s. At that time, the manufacturing technique of injection moulding allowed production costs to drop rapidly, enabling unprecedented availability of goods to the masses. MET has the capacity to do something similar for construction, although in this case the environmental consequences will not have the negative impact that plastic has had - in fact, quite the opposite.

Robot-driven construction

One of the most exciting possibilities we see with the rise in MET construction is the role it can play in accelerating the introduction of robots on site. Because building with timber is more a process of assembly than construction, it makes timber a highly attractive entry point in the development of robot-driven construction.



MAIN AND ABOVE: Aurecon has worked on a number of significant timber building projects in Asia Pacific, including the 25 King Street in Brisbane, Australia.

Both images © iendlease

“ **BECAUSE BUILDING WITH TIMBER IS MORE A PROCESS OF ASSEMBLY THAN CONSTRUCTION, IT MAKES TIMBER A HIGHLY ATTRACTIVE ENTRY POINT IN THE DEVELOPMENT OF ROBOT-DRIVEN CONSTRUCTION.** ”

Structural components made from timber are fabricated at offsite locations and transported to the job site ready to be assembled. From here, it is a question of unloading the sections from the delivery vehicle and lifting them into position on the structure. It doesn't take too much imagination to see how this simple and effective building method might be automated in the near future.

In addition to introducing new construction techniques, the rise of MET construction could also lead to a new generation of construction skills. Consider carpentry, which today we associate with skilled craftsmen working at much smaller scales to serve the residential and interior disciplines. Now imagine what skills are needed to apply that learning at a much larger scale and with an intimate understanding of structural engineering. Could we one day see the 'master engineer carpenter' in the mainstream of our industry?



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TOP AND ABOVE: Construction of the 25 King Street, an office building featuring 52 m high.



© Aurecon/Leah Desborough SM

ABOVE AND RIGHT: The 25 King Street was regarded as the tallest timber tower of its type when completed in 2018.



© Aurecon/Leah Desborough SM

Productive, safe and sustainable

While we may wait many years for the industry to get to the automation and skills levels we envision, the efficiencies of timber construction are already being realised, demonstrating why we're seeing such a strong rise in demand.

On an average construction site, both the number of people on the job site and the time taken to complete the project can be reduced by around 30% when using timber versus traditional materials and methods, based on recent experience. This offers a saving for the developer in construction costs and delivery time; and with fewer workers needed on site, it creates a safer and quieter environment.

A further benefit of the modular construction process of timber buildings is that it naturally lends itself to space-constrained job sites. Asia is home to many of the world's largest urban centres and has the fastest growing population on earth. So, a new building method that combines speed with agility offers many advantages to urban developers.

Moreover, there are clear advantages in terms of sustainability and never has this been more important. Construction today accounts for around 39% of global energy related carbon dioxide emissions, according to the World Green Building Council. But using wood in place of steel and concrete could eliminate much of the CO₂ and fossil fuel consumption associated with this construction, according to the Journal of Sustainable Forestry.

Let's look at it in another way: the research shows that near-term use of mass timber in buildings seven to 15 stories high on a global scale could have the same carbon mitigating effect as taking more than two million cars off the road per year. As a sense of scale, in 2018 there were 600,000 cars and taxis in Singapore. So that's a lot of carbon!

Overcoming preconceptions

As we look to a future with more timber construction, much of the uptake rate will depend on two things: updating building codes in place and myth-busting preconceptions about timber.

Fortunately, in terms of building codes, we are in a situation where most countries now have them. However, these codes may not be as evolved as those for more traditional construction methods. Even though we expect this to change as timber use increases, it will take time.

For the myth-busting part, it is more a question of education. One of the most



LEFT AND BELOW: **The Wave** is the sports hall at Singapore's Nanyang Technological University constructed using MET, which was opened in 2017. Now, the university is developing another MET project - Academic Building South - set to be Asia's largest timber building upon completion.



obvious preconceptions to overcome is the idea that timber buildings are more vulnerable to fire. Clearly wood is a combustible material, but as designers, we provide systems to mitigate the apparent risks. One great advantage of MET is that it doesn't lose its structural integrity in a fire. It will continue to carry load while burning, which provides the required redundancy and time for occupants to escape.

MET chars at a predictable rate, which forms a barrier to fire to limit damage - much like a heavy log of wood will smoulder and burn very slowly when added to an existing fire. Modern design codes in most countries require buildings to maintain their structural strength after

fire damage, so MET has been designed to meet these global standards.

Another preconception, and one that is particularly relevant for Asia, is that high humidity levels can adversely affect the structural integrity of timber. However, because the timber is treated, humidity is not an issue. There are certain types of timber, which are highly suitable for use in exposed areas, for example, exterior facades.

As with so many industry disruptors, the road to success is seldom without challenges. But with enlightened thinking, changing perceptions and growing interest from developers, I expect to see even more timber buildings taking root in the cities of Asia in the coming years. ■

Serena Yap is a qualified Professional Engineer, with more than 30 years of engineering experience in design and project management. She is currently working on a number of timber building projects in Singapore, including the Academic Building South at the Nanyang Technological University (NTU).

Website: www.aurecgroup.com

SINGAPORE CALLING

JP NELSON GROUP RECENTLY HELD A PRODUCT LAUNCH EVENT TO CELEBRATE THE ARRIVAL OF ZOOMLION CRAWLER CRANES IN SINGAPORE, AND ALSO TO INTRODUCE ITS COMPLETE RANGE OF MACHINES AND EQUIPMENT TO THE LOCAL CUSTOMERS.



ABOVE AND BELOW: The Zoomlion ZCC850H and ZCC2600 crawler cranes at JP Nelson's facility in Singapore, being introduced to the local customers at the product launch event.

New Zoomlion dealer

Antar Cranes Services Pte Ltd, a subsidiary of JP Nelson Equipment Pte Ltd, was recently appointed as the exclusive dealer for Zoomlion mobile cranes in Singapore, including crawler cranes, all-terrain cranes, rough terrain cranes, telescopic crawler cranes and truck cranes.

The first four models that are now available are the Zoomlion QUY350, ZCC2600, ZCC2000 and ZCC850H crawler cranes. "More models will come to Singapore next year, and we will also bring the telescopic crawler cranes, truck cranes and all-terrain cranes to the market," said Andrew Tan, general manager of Antar Cranes Services.

The ZCC850H offers a boom length of 13 – 61 m, fixed jib length of 7 – 19 m and maximum lifting moment of 357 tm. The crane's operating weight is approximately 68.5 t and its maximum lifting capacity for the fixed jib is 12.5 t.

The ZCC850H is powered by an imported Cummins QSL9-C280 engine, which is compliant with US Tier 3/EU Stage IIIA emission standards with a 300-l fuel tank.



The ZCC850H's maximum transport width is 3.38 m. Its lightweight counterweight can be assembled by using a small-sized auxiliary crane, and its crawler carriers can also be easily extended and retracted. Each of the crawler carriers is fitted with an independent hydraulic driving system, with a drive speed of 0-1.51 km/hr.



The main winch's maximum line pull is 70 kN and the rope speed is up to 137 m/min. To improve lifting efficiency, a free-fall function is available as an option for the main winch.

According to Zoomlion, most of the ZCC850H's components and parts are interchangeable with other models, including its fixed jib elements (pivot section, intermediate sections, FA-frame, front tilting-back support, rear tilting-back support, front anchoring rods and rear anchoring rods), load hook, derricking mechanism, tip boom, rear counterweight base plate and so on, therefore reducing the operating costs for the users.

Mr Tan said that the ZCC850H will be renamed ZCC850V in 2020, featuring some upgrades such as increasing its single line pull to 85 kN, incorporating imported Linde main pumps, and more.

In addition, the larger Zoomlion ZCC2600 crawler crane features an operating weight of approximately 220 t and a maximum boom length of 83 m. Its luffing jib is up to 60 m long, and the fixed jib is 12-30 m long.

ABOVE: The Zoomlion QUY350 crawler crane equipped with a luffing jib is also available in Singapore.

ABOVE AND RIGHT: The Zoomlion ZCC850H offers a boom length of 13 – 61 m, fixed jib length of 7 – 19 m and maximum lifting moment of 357 tm.



ABOVE AND BELOW: Several signing and handover ceremonies for Zoomlion cranes took place during the product launch event.





The Zoomlion ZCC2600 crawler crane has an operating weight of about 220 t and a maximum boom length of 83 m. Its fixed jib is 12-30 m long, while the luffing jib is up to 60 m long.

The ZCC2600's maximum transport weight is 30.5 t, and transport width is 3 m. Zoomlion said the crane could be erected in less than six hours. It is equipped with the imported Hirschmann LMI to ensure safety operation. The crane's cab has been designed to provide an excellent view of the jobsite and comfortable environment for the operator.

The ZCC2600 is powered by a 227 kW engine (@2,000 rpm) compliant with US Tier 3/EU Stage IIIA emission standards. It delivers a maximum torque of 1,505 Nm and the fuel tank is 700 l.

"With the arrival of these Zoomlion cranes in Singapore, we can now provide our customers with a wider range of options," said Mr Tan. "We are expanding our product offerings to help our customers carry out their work more efficiently on various projects."

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

Sunward SWDM420 drilling rig

JP Nelson Equipment Pte Ltd is also the dealer for Sunward products in Singapore. Both companies have been working together for about five years, and according to Sunward, the past two years have achieved a significant result.



Nelson Lim, managing director of JP Nelson (2nd from left) and Bruce Liu, assistant general manager at Zoomlion (2nd from right) joined the product launch event in Singapore.



The event also saw handover ceremonies for Sunward drilling rigs, attended by Harry Yong, general manager of JP Nelson (2nd from right) and Sharon Peng, general manager for international sales at Sunward (far left).



The Sunward SWDM420 drilling rig is one of the larger capacity models in Singapore market.



ABOVE AND BELOW: The Sunward SWDM420 has a maximum torque of 420 kN, drilling diameter of 2,800 mm and drilling depth of 110 m.



ABOVE: Sunward drilling rigs on display at JP Nelson's facility.

BELOW (LEFT AND RIGHT): The product launch event allowed customers to get a closer look at JP Nelson's full range of machines and equipment.



One of the bigger range models in the Singapore market is the Sunward SWDM420 drilling rig, which features a maximum torque of 420 kNm, drilling diameter of 2,800 mm and drilling depth of 110 m. The main winch of the rig has a large diameter roller and single rope winding, making it highly durable. Its maximum line pull is 450 kN.

The SWDM420 is designed with an optimised hydraulic system, contributing towards fuel savings of 7-20%, said Sunward. The drilling rig features a large triangular arrangement of mast cylinder and small luffing mechanisms of mast. The connecting part of the car and the drill mast provide high rigidity, while the supporting

angles of the mast cylinder and the mast provide good stability during drilling operations, especially in hard stratum.

The Sunward SWDM420 is equipped with a 399 kW engine (@2,100 rpm). The machine is also designed for easy repair and maintenance, with a standard centralised lubrication system.

JP Nelson Equipment provides a holistic range of machinery for both the construction and foundation sectors, including cranes, vibratory hammers, diaphragm wall grabs, ground improvement machinery as well as general machinery. ■

Website: www.jpnelson.com.sg

SOUTHEAST ASIA PROJECTS EMBRACE DIGITALISATION

BENTLEY SYSTEMS RECENTLY ANNOUNCED THE WINNERS OF ITS YEAR IN INFRASTRUCTURE (YII) 2019 AWARDS. THIS ANNUAL PROGRAMME HONOURS THE EXTRAORDINARY WORK OF BENTLEY USERS ADVANCING DESIGN, CONSTRUCTION, AND OPERATIONS OF INFRASTRUCTURE THROUGHOUT THE WORLD. HERE, THREE WINNERS FROM SOUTHEAST ASIA SHARE THEIR PROJECTS IN DETAIL AND EXPLAIN HOW THEY OVERCAME THE CHALLENGES SUCCESSFULLY.

Winner: PT Wijaya Karya (Persero) Tbk ■ Category: Bridges

Design and Build Harbour Road 2 Project - Jakarta, Indonesia



PT Wijaya Karya is performing design review on the project. The double-decker design was chosen to make the best use of a site constrained by heavy traffic, surrounding buildings, road interchanges, railroads, and waterways, as well as underground and intertwined gas pipelines, water pipes, and optical fibre lines.

The Harbour Road 2 bridge design and build project in Jakarta is a new double-decker elevated toll road in Indonesia. Upon completion, it will provide efficient road access between Ancol and Pluit area and will accommodate intermodal services, such as toll roads, trains, light rapid transit, and busways. It is expected to accommodate 63,500 vehicles per day along 9 km of the elevated toll road.

The project is part of the government’s strategic programme to reduce traffic congestion on the north side of Jakarta. It is expected to set a new benchmark in overcoming the technical challenges of building one of the longest double-decker bridges in the world with a total length of 3.985 km.

Indonesian construction company PT Wijaya Karya (Persero) Tbk (Wika) is performing design review on this US\$530 million

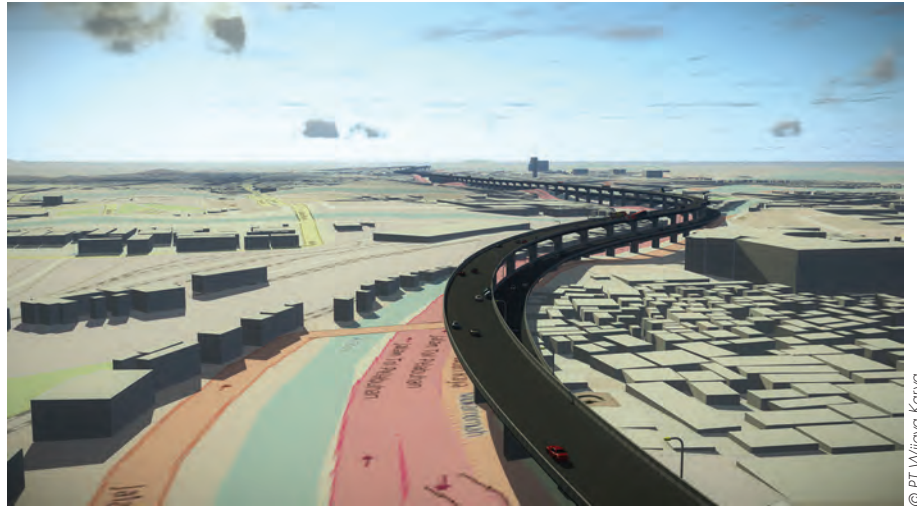
project. The double-decker design was chosen to make the best use of a site constrained by heavy traffic, surrounding buildings, road interchanges, railroads, and waterways, as well as underground and intertwined gas pipelines, water pipes, and optical fibre lines.

The project required an effective road structure and alignment design so that the project team could place the piers without disturbing river traffic. The team also needed to gain all necessary approvals from the appropriate ministries, yet still adhere to a tight schedule. As such, Wika needed innovative design and work processes to face these challenges and to ensure it executed the project with the highest standards possible.

Reducing costs with BIM

In the survey phase, the team used ContextCapture from Bentley to process imagery for photogrammetry in only 10 days, six times faster than using previous methods. This reality context helped Wika reduce design errors, compress the project timeline by four months, and save US\$6 million.

Bentley’s OpenRoads Designer, OpenBridge Modeller, and gINT softwares were used by Wika to produce final designs and alignments, helping the company to eliminate 1,600-sq-m of waterway foundation work and reduce design iterations by 25 working days, saving approximately US\$120,000. The parametric design capabilities of OpenBridge Modeller increased modelling



© PT Wijaya Karya

Bentley’s BIM solutions provide comprehensive infrastructure applications that help PT Wijaya Karya optimise project costs, improve the efficiency of the design process time, and ensure project safety.

efficiency by over 40% compared to previous modelling methods.

In addition, the project team used Bentley Navigator to analyse project progress and reduce time dimension conflicts, which allowed the project to be completed on time. Anticipated savings during the design stage are expected to be as much as 10% of the project value. The use of Bentley’s open modelling and simulation applications for their interdisciplinary collaborative workflows helped Wika create very precise and dynamic deliverables.

As construction progresses towards completion in 2022, Wika anticipates these BIM applications will have helped the

company lower labour costs and reduce construction rework and increase profit margins and cost efficiency by another 10%. Bentley’s BIM applications will help increase the return on investment (ROI) by achieving it three years earlier than the initial target date of 2035.

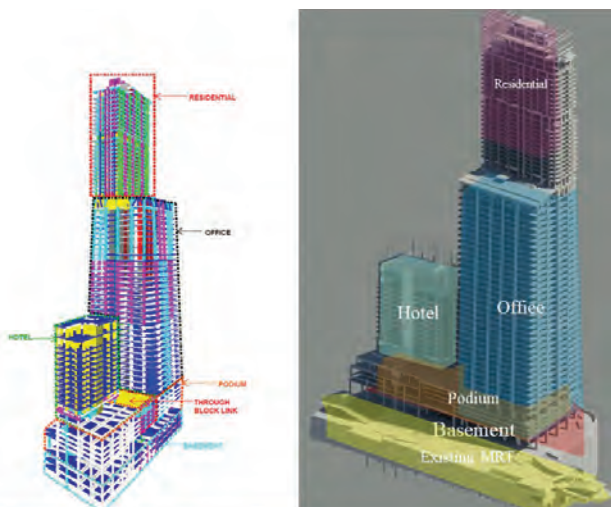
“Bentley’s BIM solutions provide comprehensive infrastructure applications that help us optimise project costs, improve the efficiency of the design process time, and ensure project safety. Bentley’s technology and interoperability have played a vital role in this project becoming a new benchmark in the construction industry in Indonesia,” said Romi Ramadhan, BIM manager at PT Wijaya Karya. ■

Winner: Arup Singapore Pte Ltd ■ Category: Geotechnical Engineering

Tanjong Pagar Mixed Development - Singapore

The 64-storey Tanjong Pagar Centre is currently the tallest building in Singapore. Located in the central business district (CBD), the development includes a 290-m-high mixed-used residential and office tower, a medium-rise hotel block, a six-storey podium for commercial use, and an 18-m-deep three-level basement with a direct link to connect the existing underground Mass Rapid Transport (MRT) railway station.

A high demand for development in the city means that many projects are expanding underground and into highly congested areas. As a result, local regulatory agencies have specified stringent



ALL IMAGES: Arup Singapore was engaged as the civil and structural consultant in charge of developing an effective and innovative solution for the project.



© Arup Singapore



© Arup Singapore

criteria over the ground movement caused by the construction of new developments.

Key governing criteria for the project is that, at any stage of construction, the movement of MRT structures needs to be controlled within 15 mm in any direction, and the differential movement of rail tracks to be within a ratio of 1:1000. Additionally, there are two buildings resting on shallow foundation located less than 20 m from the proposed development, and those movements need to be maintained below 25 mm. The foundation system also needs to be designed so that the differential settlement between the podium area and tower area with high loading is made within an allowable ratio of 1:500. With these technical and regulatory requirements, the project provided significant technical challenges for the engineers.

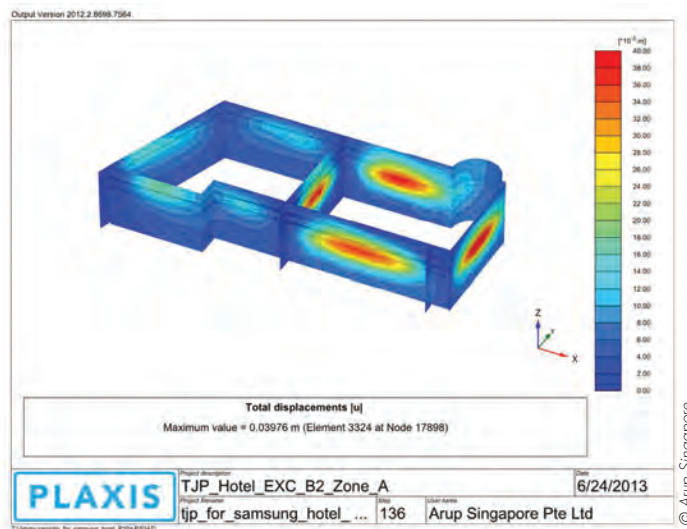
Challenging foundation design

Arup Singapore Pte Ltd was engaged by the developer - GuocoLand (Singapore) Pte Ltd - as the civil and structural consultant in charge of developing an effective and innovative solution for this S\$3.2 billion project. The project team had to be sensitive to ground movements because of the proximity to high profile neighbours in the CBD area, and therefore it used robust geotechnical solutions for a safe and successful execution of foundation and basement excavation works.

During the preliminary design stage, a detailed study of sub-soil conditions was conducted, as well as a thorough review of previous case studies with similar project conditions. The team considered all empirical and analytical methods available to select and size foundation and earth retaining and stabilising (ERSS) work.

Digital solutions to speed up work

Given a tight programme deadline, the proposal for the design



© Arup Singapore

TOP AND ABOVE: Bentley softwares have allowed Arup to enhance the design methodology for prediction of ground behaviour, which in turn helped resolve site issues and challenges encountered during construction - thus saving time, effort, and cost.

of the foundation and basement had to be finalised immediately after ground investigation (GI) works. Arup used gINT software from Bentley to manage the incoming geotechnical data, including borehole logs, lab, and in-situ soil testing results.

While overseeing the site investigation works and reviewing the soil properties with data interpretation tools of gINT software, any findings or information were reviewed and incorporated in the design concurrently. The geotechnical interpretative report (GIR)

was produced within a week of the completion of the GI works, enabling all the ground-associated risks to be addressed and final soil parameters incorporated during the preliminary design stage.

Phased excavation offered more control of ground disturbances, which avoided performing the bulk excavation at one time and enabled the team to start the superstructure works early and simultaneously with the basement construction. Arup used gINT for borehole data management and lab results from in-situ soil testing, providing the engineer greater confidence to decide what special tests are required for specific areas of the design. The team also used coupled 2D drawings and Plaxis 3D from Bentley for stress consolidation tests throughout excavation.

Since the bulk excavation of the basement was only 6 m away from the existing MRT station wall, the deflection of the adjacent retaining wall contributed significantly to the movement of station structures. The Plaxis 3D modelling ensured the predicted wall deflection to be well controlled, thereby enabling the MRT structure movements to be below the 15-mm limit.

Incorporating the pile-raft system into the Plaxis 3D model allowed the behaviour of the foundation under full permanent

loading to be understood. Using the predicted proportion of load sharing between pile and soil enabled the team to reduce the loadings on bored piles by 30% to 35%, thus optimising the pile penetrations. It has also enabled the team to optimise the thickness of raft according to different loading zones.

Construction was successfully completed in 2016, and the development is fully operational and open to the public. The efficiency of Plaxis 3D software with all-in-one analysis for both soil and structure provided cost and time optimisation, efficient construction, and most importantly, it controlled the wall deformation and impact to the adjacent critical structures.

“Tanjong Pagar development (Guoco Tower) is recognised as a landmark building, which, together with other impressive structures, shapes the Singapore skyline as we see it today. The design and construction required engineering excellence for safe and cost-effective construction,” said Ei Sandar Aung Win, senior geotechnical engineer at Arup Singapore. “Bentley software enhanced the design methodology for prediction of ground behaviour, which helped resolve site issues and challenges encountered during construction, saving time, effort, and cost.” ■

Winner: Lebuhraya Borneo Utara Sdn Bhd ■ Category: Road and Rail Asset Performance

Pan Borneo Highway - Sarawak, Malaysia



Pan Borneo Highway Sarawak is believed to be the first road and highway project in Malaysia to utilise BIM technology.

To accelerate socio-economic growth in East Malaysia, a plan to fully develop and upgrade the Pan Borneo Highway was announced in 2013. Construction began in 2015 and, when fully completed in 2021, the four-lane dual carriageway and toll-free Pan Borneo Highway will be the transportation backbone of the area and play a major role in opening up economic corridors and opportunities for residents and local businesses.

Pan Borneo Highway Sarawak is the benchmark for government road projects in Malaysia, providing increased efficiency throughout delivery of the project, and setting the stage for operation and maintenance of the highway in the future. It is said to be the first road and highway project in Malaysia to utilise BIM technology. The BIM information has been integrated with a geographical information system (GIS) to produce highway

information modelling (HIM) for the entire 786 km of phase one.

Connected data

During the phase-one delivery stage, a connected data environment (CDE) was used extensively to manage the design and construction data generated on the project. Project delivery partner Lebuhraya Borneo Utara (LBU) used ProjectWise to manage 3D design information and detect clashes earlier, which helped to avoid unnecessary rework and simplify construction management.

AssetWise enabled the team to link the valuable information being generated with asset tags in order to track and manage change throughout project delivery. For example, upon completion of the 32-km span from Telok Melano to Sematan in January 2019, LBU began integrating construction data from ProjectWise into Bentley’s AssetWise for its ongoing operations and maintenance. The ability to provide seamless integration with a CDE that spans project delivery and operations unlocks the full potential of the organisation’s data.

Having facilitated the integration of data from multiple sources, along with tagging assets in line with the Malaysian government highway asset tagging system MYSKATA, the CDE is providing a common view of accurate and reliable information. AssetWise supports the asset management needs of Pan Borneo Highway Sarawak as the single source of truth for asset management information.

AssetWise combines a road information system, a bridge management system, and a maintenance management system that is specifically developed and designed to include development of non-conformance reports. It also includes a cyclic work programme and customised interim payment certificate for managing work orders, as well as a web-based GIS, a mobile-based field data collection for inventory of assets and their condition, a pavement management system in conjunction with HDM-4, and a real-time dashboard and reporting system.

‘More informed decisions’

In addition to seamlessly integrating design and construction information on the newly built network, LBU is also using ContextCapture to incorporate the reality context for stretches of existing roads on a highway network built over the last 10 to 15 years. Leveraging images captured using unmanned aerial vehicles and drones, LBU has built an accurate record of asset



© Lebuhraya Borneo Utara

ABOVE AND BELOW: **Lebuhraya Borneo Utara** has used Bentley’s ProjectWise to manage 3D design information and detect clashes earlier, helping to avoid unnecessary rework and simplify construction management. The company also used AssetWise to link the valuable information being generated with asset tags in order to track and manage change throughout project delivery.



© Lebuhraya Borneo Utara

information for the entire 1,060-km Pan Borneo Highway as it works to meet the objectives of the Malaysian government to optimise costs during operation and maintenance.

AssetWise leverages a CDE to facilitate the inter-operation of multiple data sources, providing a common view of data that delivers accurate and reliable information when it is needed for operations, maintenance, and engineering. AssetWise enables LBU to mitigate risks, increase operational efficiency, and ensure regulatory compliance in the highway’s asset management. The improved information flow and seamless integration allows the collection, analysis, and control

of relevant asset information.

As a result, senior management can make strategic decisions and policies that can be more efficiently translated into operational programmes during the implementation stage. The result is efficient, economic, and effective management of the Pan Borneo Highway network.

Sauani Abdul Hamid, CEO at Lebuhraya Borneo Utara Sdn Bhd said, “AssetWise provides industry-leading tools for network management and asset inventory coupled with unparalleled capabilities in the field of road asset maintenance. AssetWise helps to optimise operations and maintenance through more informed decisions based on the data in its CDE.” ■

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The Liebherr LB 16 unplugged drilling rig being used on a job site for the first time, at the Bludenz-Bürs junction of the A14 motorway in Austria.

WHEN TECHNOLOGY MEETS CREATIVITY

SOUTHEAST ASIA CONSTRUCTION RECENTLY VISITED LIEBHERR'S FACILITIES IN KIRCHDORF, GERMANY AND NENZING, AUSTRIA TO TAKE A CLOSER LOOK AT THE COMPANY'S LATEST INNOVATIONS AND MEET UP WITH THE TEAM BEHIND THESE DEVELOPMENTS.

Liebherr LB 16 unplugged

The new Liebherr LB 16 unplugged – introduced at bauma 2019 - is dubbed the first drilling rig in the world that produces local zero emission. The machine offers an alternative drive concept (electro-hydraulic version), and it can also be operated by battery without a cable, hence unplugged.

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

The LB 16 unplugged has an electric engine delivering 265 kW of power. The battery is designed to last for a 10-hour working day and can be simply charged overnight using a standard jobsite electric supply (32 A, 63 A). With a 125 A supply, the battery can be fast-charged in barely seven hours.

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

Manufactured at Liebherr's facility in Nenzing, Austria, the LB 16 unplugged provides higher safety and simpler application, thanks to the Ground Pressure Visualisation system. This system calculates the current ground pressure of the machine in real time and compares it with the specified safety limits of the relevant position. The ground pressure is displayed in the operator's cab and the operator is always aware of whether the



ABOVE AND BELOW: Liebherr showcases the LB 16 unplugged to the global trade media during a press event at the company's facility in Nenzing, Austria.



machine is situated in, or is approaching, a critical area.

The LB 16 unplugged is also equipped with a new cabin concept, which features a modern air-conditioning system with improved airflow, an optimised field of vision and reduced noise protection, as well as an orthopaedic operator's seat with integrated heating and cooling. The machine is currently available in the European market, and has already completed its first application.

LB 16 unplugged goes to work

The LB 16 unplugged was recently used on one of the largest roadwork sites in western Austria, at the Bludenz-Bürs junction of the A14 motorway.

There are frequent traffic jams and hold-ups due to congestion. In order to avoid dangerous tailbacks on the motorway, ASFINAG is building a large roundabout with two bridges over the A14, as well as two new connections to regional roads, also with a roundabout and water protection facility.

In this project, the local company i+R carried out deep foundation work on the west side using the LB 16 unplugged drilling rig.

“Sustainability in the construction industry is not a foreign concept, but common practice for ASFINAG. Innovative developments like the world's first drilling rig with zero emissions show that also on ASFINAG construction sites there is enough room for environment-friendly construction practices,” said Andreas Fromm, managing director of ASFINAG Bau Management GmbH.

The challenges for i+R were the narrow construction site itself, as well as the restricted working height. The pile foundations had to be placed directly under a power line. Therefore, the drilling rig was designed as a low head, i.e. with a shorter leader. For the project, i+R installed 148 piles and drilled 1,742 m into the ground. Approximately 1,200 cu m of concrete were poured. The piles varied between 10 m and 14 m in depth, featuring a diameter of 900 mm. Due to the restricted working height, casing pipes with a shorter length (2 m) had to be used and the reinforcement cages had to be inserted in sections. The machine achieved approximately two piles per day.

The benefits of the LB 16 unplugged - producing no local exhaust emissions and generating considerably less noise - were favourable on the job site. “You don't have to shout all the time. You can talk



ABOVE, LEFT AND BELOW: The Liebherr team explains the features and benefits of the LB 16 unplugged in detail.

normally and your colleague hears, even when standing further away. Otherwise, when the engines are running at full power they are very loud and you always have to raise your voice, which is a burden in itself. You also don't hear little things in the surrounding area, which you do now during ongoing site work,” explained foreman Sebastian Timpe. The quieter environment is also a safety-relevant aspect in regular construction site operation.

Sometimes the concrete was delivered by a Liebherr ETM 905 concrete mixer with electric drum drive. In normal operation, the battery capacity was sufficient for the entire working day. As a plug-in hybrid the battery could be charged during the journey or externally via a plug, e.g. at a concrete mixing plant. i+R also deployed an electric compact excavator on the project. Thus, it is believed to be the first time that deep foundation work on a construction site was performed using



almost exclusively electrically driven machines. Estimated over one year, approximately 35,000 l of diesel can be saved and more than 92 t of CO₂ emissions can be avoided.

“The construction site at Bludenz-Bürs is a win-win situation for everyone: enhanced safety and fewer traffic jams for the local Vorarlberg people, and environmentally friendly use of construction machines on the currently largest ASFINAG construction site in Vorarlberg,” said Mr Fromm.



TOP: At the Bludenz-Bürs junction, the LB 16 unplugged was used by local company i+R t to install 148 piles and drill 1,742 m into the ground. The piles varied between 10 m and 14 m in depth, featuring a diameter of 900 mm.

ABOVE: The challenges for i+R were the narrow construction site itself, as well as the restricted working height. The pile foundations had to be placed directly under a power line. Therefore, the drilling rig was designed as a low head, i.e. with a shorter leader.



New articulated dump trucks

Liebherr has developed a new generation of articulated dump trucks (ADTs) in the 30 - 45 short ton class (approximately 25 - 40 metric tonne). They are currently undergoing testing at the company's Kirchdorf facility in Germany. The machines are planned to enter mass production in 2020, initially included in the company's rental fleet. Sale is expected to be available in 2021.

Designed and manufactured at Liebherr's Kirchdorf facility in Germany, the new ADTs are suitable for use in quarries, large infrastructure projects, and special applications in tunnel construction. They provide operators with an excellent view to the front, side and rear as well as to both sides of the articulated joint.



TOP, ABOVE, BELOW LEFT AND BELOW RIGHT: Liebherr's new articulated dump trucks are scheduled to enter mass production in 2020. They are designed and manufactured at the company's Kirchdorf facility in Germany.





The operating and maintenance concept of these new ADTs has been completely revised and optimised, so that users can keep their operating and maintenance costs as low as possible.

“The dump truck completes its daily maintenance work automatically,” said Rudolf Arnold, managing director for sales at Liebherr-Hydraulikbagger GmbH. “The weighing system is integrated as standard in the machine. The comprehensive assist systems include the hill start assist, the stability assistant, adaptive cruise control, as well as a height limitation.”

The new ADTs will complement the comprehensive product portfolio of Liebherr-Hydraulikbagger. The company said that at present, sales of its earthmoving machines produced in Kirchdorf are strongly focused on the European market. “However, with the introduction of new products such as the ADTs, the balance will shift towards Africa, Asia and America,” said Mr Arnold.

The new Liebherr dump trucks are being tested at the company’s development and demonstration centre



TOP AND ABOVE: The new Liebherr articulated dump trucks are seen here undergoing testing at the company’s development and demonstration centre in Kirchdorf.

in Kirchdorf, which was inaugurated in 2018. The 12.8-ha facility serves as the development and testing ground for Liebherr earthmoving machines and

material handlers. “This investment of €30 million ensures the successful implementation of our future-oriented technologies,” stated Mr Arnold.

Kirchdorf an der Iller, where Liebherr-Hydraulikbagger GmbH is based, is the birthplace of the Liebherr Group as it was here that Hans Liebherr founded the company in 1949. Today, the portfolio of Liebherr-Hydraulikbagger includes the largest range of compact and standard wheeled excavators with operating weights of 10-28 t, railroader with operating weights of 22 - 25 t, as well as material handlers on wheeled and crawler undercarriages with operating weights of 18 - 175 t.

In total, 3,500 machines are produced every year in Kirchdorf on an area totalling roughly 43 ha. In 2017, together with the entire workforce, the company celebrated the delivery of its 75,000th wheeled excavator. The 80,000th wheeled excavator was delivered in 2018.. ■

Website: www.liebherr.com



The Kirchdorf development and demonstration centre serves as the development and testing ground for Liebherr earthmoving machines and material handlers.

LIEBHERR INTRODUCES AUGMENTED REALITY APP

The Liebherr AR Experience, which can be downloaded free of charge as an app on smartphones and tablets, projects digital 3D data onto actual surroundings with the help of augmented reality. Three different virtual construction sites can be anchored on any horizontal surface in the room and viewed from all imaginable perspectives. Every desk, every windowsill, every bar counter or every floor can become the stage for the Liebherr AR Experience.

Different scenes that run like a three-dimensional film can be played for each construction site. Here, the observers become the camera crew. Discovering the complete product range from Liebherr-Werk Nenzing that relates to material handling, lifting and deep foundation work becomes an experience, which can be repeated over and over again from different perspectives.

Crawler crane, deep foundation machine and duty cycle crawler crane engineering and technologies can be experienced in a completely new way. Not only machines are in focus but also various assistance systems and digital solutions from Liebherr. Difficult, complex tasks can be presented and explained simply and comprehensibly. The app contains scenes and content relating to heavy lifts, material handling and deep foundation work.

Heavy lifts (LR 1300.1) – Crane Planner: Heavy lifting work requires extremely



ALL IMAGES: The Liebherr AR Experience, which can be downloaded free of charge as an app on smartphones and tablets, projects digital 3D data onto actual surroundings with the help of augmented reality. The app contains scenes and content relating to heavy lifts, material handling and deep foundation work.

precise preparation. Planning is of central importance here, in order to ensure the correct configuration is chosen right from the start. The app shows what Liebherr's LR 1300.1 crawler crane is able to achieve, as well as how safely even the heaviest loads can be moved.

Material handling (HS 8200) - LiSIM: Turnover, handling, winch capacity, setup times, transport – performance is measured in many ways when it comes to dragline operation. All parameters of Liebherr's

HS 8200 duty-cycle crawler crane have been optimised to maximise performance potential. Using the AR app, users can experience anywhere and at any time how the duty-cycle crawler crane masters the extremely heavy dragline.

Deep foundation work (LRB 16) - LIPOS: More can be seen using the Liebherr AR app. It reveals not only what is happening above, but also what is happening below the surface when a Liebherr piling and drilling rig is at work. ■

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SYDNEY METRO

When Sydney Metro is extended into the central business district (CBD) and beyond in 2024, the rail line will run from the city's booming north west region under Sydney Harbour, through new underground stations in the CBD and beyond to the south west. This project - owned by the Transport for New South Wales (TfNSW) - will have a target capacity of about 40,000 customers per hour, similar to other metro systems worldwide. It will deliver 31 metro stations and more than 66 km of new metro rail.

Sydney's current suburban system can accommodate up to 24,000 passengers per hour each line. Sydney Metro, together with signalling and infrastructure upgrades across the existing Sydney rail network, will increase the capacity of train services entering the Sydney CBD - from about 120 an hour today to up to 200 services beyond 2024. That's an increase of up to 60% capacity across the network to meet demand.

Formwork solutions for tunnel intersections

Doka Global Expertise Centre (GEC) for tunnel infrastructure - based at the headquarters in Austria - has been heavily involved

in the project, working closely with John Holland, CPB Contractors and Ghella Pty Ltd (JHCPBG). It will account for more than 20,000 engineering hours to design formwork substructures for the concrete, which will line and support the massive underground station caverns and tunnel intersections.

Standard but specialised Doka SL-1 components and modules have been employed for most requirements, but Doka Australia has also drawn on its parent company's expertise to design and manufacture custom accessories. Doka worked intensively to produce innovative formwork designs for all mined tunnel intersections, pedestrian and service adits at Martin Place, Pitt Street and Victoria Cross Station sites.

Doka said that each individual mined tunnel profile and intersection requires unique designs for off-site preassembly and on site installation for the in-situ concrete pour. The company's team is in constant communication, meetings and workshops with the JHCPBG site engineering teams and subcontractors. This approach ensures all parameters and requirements are considered in finding the best solution to increase the efficiency and safety of the work.



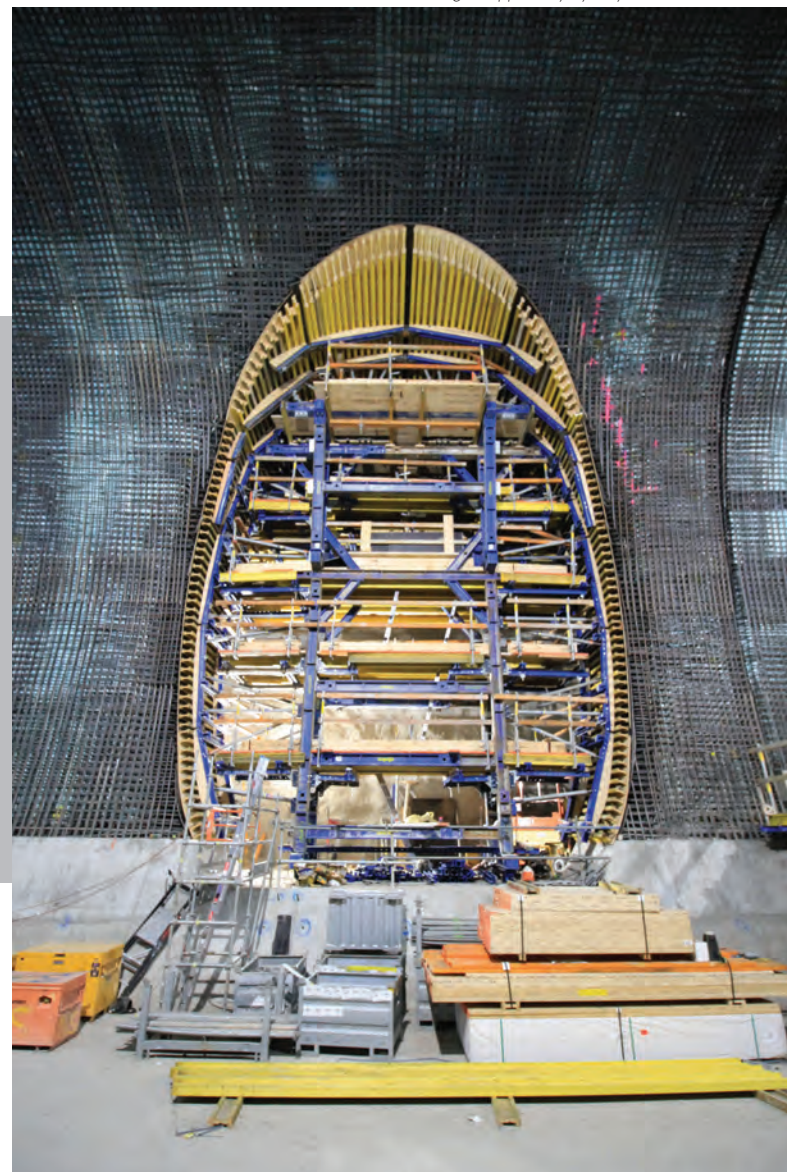
All images supplied by Sydney Metro

OPPOSITE AND ABOVE: The construction of Sydney Metro is currently ongoing. When completed, the rail line will run from the city's booming north west region under Sydney Harbour, through new underground stations in the CBD and beyond to the south west. Doka has been involved in the project, providing formwork engineering services, material and equipment supply for the mined tunnel concrete lining construction at Martin Place, Pitt Street and Victoria Cross Station sites.

“Doka has demonstrated a willingness to tackle the complex and unique challenges of our project, which has resulted in a high level of collaboration between the construction teams and Doka’s local and international branches,” said Benjamin Russo, planning & engineering manager for mined tunnels.

The deliveries started in early 2019 and Doka materials will be used through to late 2020 when construction of concrete lining finishes. The Doka SL-1 heavy-duty supporting system is extremely adaptable. SL-1 beams, walings and struts can be arranged in variable configurations, enabling optimum use to be made of each item of equipment, with short set-up times and heavy-duty supporting-unit components. Built-in safety systems ensure high workplace safety including integrated work platforms and ladderways. ■

Website: www.doka.com



RIGHT: The project has become a showcase for Doka’s SL-1 heavy-duty supporting system - a modular system that provides complete formwork solutions for widely differing tunnel cross-sections, regardless of shape and load.

THE CAPITASPRING

CapitaSpring, one of the tallest buildings in Singapore's Raffles Place district, is currently under construction. At 280 m high, the S\$1.82 billion development by Capitaland will feature 51 stories of Grade A office space, ancillary retail space and a serviced residence. Dragages Singapore has been appointed as contractor on the project. To help carry out its work, the company is using several Potain luffing jib tower cranes from Manitowoc, including the first Potain MCR 295 in Singapore.

Lifting solution

Dragages Singapore leased the MCR 295, and four other Potain luffing jib cranes (two MR 295s and two MCR 225As) from tower crane rental company Manta Equipment. The MCR 295 is available in three versions, each with their own rated capacity and



ABOVE: The CapitaSpring is currently under construction.

RIGHT: Upon completion, it will feature 51 stories of Grade A office space, ancillary retail space and a serviced residence.





ABOVE AND LEFT: The Potain MCR 295 working on the CapitaSpring. The crane was chosen to help the contractor overcome the project's challenges, such as tight timetable, tall building height and limited space in a congested downtown location.



Apart from the Potain MCR 295, the other luffing jib cranes supplied on the project are two units of MR 295 and two units of MCR 225A.

load chart, but each capable of working with up to 60 m of jib. The three versions – H16, H20 and H25 – have maximum capacities of 16 t, 20 t, and 25 t, and for the CapitaSpring project the contractor selected the H20 model.

With the project's tight timetable, tall building height and limited space in a congested downtown location, the MCR 295 was a perfect choice, said Julien Esch, managing director of Dragages Singapore.

"There weren't many cranes with the capacity we need plus the ability to reach the final building height in an efficient manner," explained Mr Esch. "We consulted with Manta and decided the MCR 295 was the right model. Although it's still relatively new, it has the features to meet our jobsite needs."

A key challenge on the project site is the lack of space, but the MCR 295 has an efficient working envelope, noted Mr Esch. "With the MCR 295, we were able to configure the jibs to just 40 m, so the crane can operate within the tight constraints of the jobsite. This definitely helps with construction. The MCR 295 is proving its worth as a world-class machine in this project. Its unparalleled adaptability and lifting ability have been crucial in keeping our jobsite efficient and effective."

"With a compact 2 m by 2 m footprint and optional Top Tracing II anti-collision system, the MCR 295 is ideal for congested urban projects," said Suman Das, regional sales manager for tower cranes at Manitowoc. "Owners can choose from a variety of winch options too, all with

Potain's unique variable frequency drive technology that offers smooth acceleration and precise control."

Dragages Singapore is a leading Singapore construction company that has operated in the country since 1984. It is part of the global Bouygues Construction network and has been involved in a wide range of landmark projects in the country, including the Singapore Sports Hub.

Manta Equipment is one of Asia's leading tower crane rental companies, serving primarily the construction and infrastructure sectors in Hong Kong, Macau and Singapore. In Singapore, the company has been leasing Potain cranes to customers for over 25 years and today has more than 70 units in its fleet. ■

Website: www.manitowoc.com

Building carpark in Japan with returned concrete

The Izu peninsular in Japan has been designated as a protected area and geological park by UNESCO in 2018, characterised by its hills and features of volcanic origin covered by rich, lush vegetation. From the town of Izu Nagaoka, visitors can take a cable car at the Panorama Park to the summit of Mount Katsuragi, where they can admire a view of Mount Fuji on the right and the Bay of Suruga on the left.

The summit of Mount Katsuragi attracts a lot of tourists every year and, with the Izu peninsula being the site for the indoor cycling events during the 2020 Olympic Games, the number of visitors is expected to increase.

In preparation for the event, the company that manages the cable car - Dainici Izu no Kuni City Panorama Park - decided to extend the carpark at the departure station by 1,500 sq m. This new extension was made from roller compacted concrete (RCC), so it has high mechanical properties and durability.

The mix for the concrete (cement, aggregates and a small amount of water) was prepared in special mixing units that disperse the water evenly throughout the mixing process, in order to form a consistency similar to that of damp earth.

Once mixed, the concrete was transported to site on trucks and then offloaded, spread out and distributed in layers of between 10- and 20-cm-thick. Soon after that, the compaction phase started.

Returned concrete

The need to safeguard the environment around the cable car station meant all the work carried out had to have a minimum impact on the environment and maximum use of recycled materials.

As a result, the surfaces for the new carpark were built using RCC with low cement content and only recycled aggregates from the recovery process of returned concrete, that is, concrete that hasn't been used on site and is returned to the production plant while still fresh.



ABOVE: The production phase of roller compacted concrete (RCC) that would be used to build a new carpark at the Panorama Park cable car station, located in the town of Izu Nagaoka.

BELOW: Once mixed, the concrete was transported and distributed on site in layers of between 10- and 20-cm-thick, before the compaction phase started.



Returned concrete typically represents the largest amount of residual material at the concrete manufacturing plant and accounts for around 3% of the total production. Disposing of returned concrete in landfill sites would bring a negative impact on the environment, releasing about 267 kg of CO₂ per cubic metre of concrete.

Now, with the Re-Con Zero Evo admixture from Mapei, it is possible to recover all returned concrete by transforming it - in just a few minutes - into an aggregate mix that can be reused to produce new concrete.

Mapei's sustainable admixture

The Re-Con Zero Evo admixture, developed in the Mapei R&D laboratories, allows the sustainable recovery of returned concrete. When this admixture is added to returned concrete in a mixer truck, or in any other suitable mixing system, in the space of just a few minutes the special additives of the product absorb any free water present and 'dry' the concrete, turning it into a mix of aggregates without generating any waste.

Such a sustainable, innovative solution clearly offers many advantages. The production of aggregates from returned concrete minimises the acquisition of natural aggregates, which in turn limits the depletion of raw materials from natural sources. It also eliminates the use of landfill sites, which further reduces its impact on the environment by reducing the amount of CO₂ produced.

The construction of the new carpark was undertaken by Nagaoka Ready-Mixed Concrete NR-Mix company, a distributor of Re-Con Zero Evo in Japan. A total of 170 cu m of RCC was placed, with a dose of just 69 kg/cu m of cement and 2,220 kg/cu m of recycled aggregates, thanks to the use of Re-Con Zero Evo.

Overall, the project used approximately 380 t of recycled aggregates from returned concrete, leading to savings of around 100 t of CO₂ emissions. ■

Website: www.mapei.com.sg

TOP RIGHT: Several road rollers were deployed to perform compaction work on the concrete.

MIDDLE: A close-up look of the RCC during the compaction phase. The aggregates made from returned concrete with Re-Con Zero Evo are perfectly compacted and bound solidly within the cementitious matrix.

RIGHT: A view of the completed carpark. It has used a total of 170 cu m of RCC, with a dose of just 69 kg/cu m of cement and 2,220 kg/cu m of recycled aggregates.





WINSTON-SALEM BRIDGE

In November 2018 a one-mile (about 1.61 km) stretch of major highway in Winston-Salem, North Carolina, in the US, was closed for demolition and resurfacing. It is scheduled to reopen in early 2020, complete with new bridge overpasses, modernising on and off ramps, and straightening its path (with fewer curves) through the city.

In order to accommodate a demanding schedule, a Link-Belt 182-mt 248 HSL crawler crane was purchased for eight traffic and two pedestrian bridges for the project. All but three of the bridges are single span, with 1.65-m bulb tee prestressed concrete beams measuring as long as 37.7 m and weighing up to 51,255 kg. Three of the bridge crossings are single-span, each with six concrete girders placed 8 ft (about 2.4 m) apart.

As of May 2019, the pace of bridge construction could be the most impressive aspect with a new bridge being constructed every six weeks. “We’ve accomplished four completed bridges, on schedule, each one in six weeks, and are setting another now,” said a construction manager for the project. “We knew we would be breaking down this 248 HSL a couple of times on this project.

So we wanted a crane that could be broken down and built back up quickly and easily without the need of another crane. Since there really isn’t enough room for an assist crane, we wanted it to be self-erecting.”

The Link-Belt 248 HSL is positioned on a 30.4 m stretch of timber mats to lift the girders off transport trailers and into position. This length of timber matting was used to accommodate the 14-month schedule that will see construction all hours of the day in all four seasons.

The new bridge overpasses will have a minimum clearance of 5.1 m to accommodate the varying freight traffic that travels through the area. Bridge and abutment foundations have been reinforced with 60.9 cm H-pile. Most of those have been driven with a diesel hammer with 33.5 m long leads attached to the Link-Belt 248 HSL with 50.2 m of boom, enabling the pile to be longer.

The 248 HSL travels between each bridge location in the heart of the city. Since most bridges are single span the crane is able to place the beams by itself. ■

Website: www.linkbelt.com



OPPOSITE AND LEFT: A stretch of major highway in Winston-Salem, North Carolina, has been closed for demolition and resurfacing. It is scheduled to reopen in early 2020, complete with new bridge overpasses, modernising on and off ramps, and straightening its path (with fewer curves) through the city.

BELOW: To meet the project's demanding schedule, a Link-Belt 248 HSL crawler crane has been purchased to work on eight traffic and two pedestrian bridges. The crane can be seen here being positioned on a 30.4 m stretch of timber mats to lift the girders off transport trailers and into position.



RECYCLING C&D WASTE IN CANCÚN, MEXICO



All images © Rubble Master



TOP AND ABOVE: The RM 100GO! mobile crusher from Rubble Master working in the Mexican city of Cancún to transform construction and demolition waste into valuable final materials. These recycled materials are then used directly on site for fillings and the substructure of roads.



In the city of Cancún, Mexico, an RM 100GO! mobile crusher from Rubble Master is currently being deployed to process construction and demolition (C&D) waste. This is a pioneering project jointly implemented by Rubble Master and the city administration, setting a milestone for environmental awareness and sustainability in the Mexican construction industry.

Instead of transporting concrete, C&D waste and asphalt away from construction sites and disposing of them in landfills, the RM 100GO! recycling system transforms them into valuable final materials. These recycled materials are then used directly on site for fillings and the substructure of roads. The project is also supported by the local RM sales partner Euro Representaciones SA de CV, which has an established service structure throughout Mexico.

“The people at the city administration in Cancún are impressed by the throughput capacity and functionality of the RM 100GO!

crusher and see it as a unique opportunity to draw attention to the advantages of recycling C&D waste” said Gerald Hanisch, founder and CEO of Rubble Master. “It makes us very proud to be part of this unique project and we hope to make a significant contribution to the development of C&D waste recycling in Mexico and throughout Latin America.”

“The Rubble Master benefits, such as compactness, mobility and the rapid set-up time of the machine, make it much easier to use and enable flexible recycling of the material. Because the crusher is usually used to process C&D waste in the city centre or in residential areas, low noise, dust suppression and low CO₂ emissions are basic requirements for sustainable operation,” said Ricardo Archundia, secretario, municipal de obras y servicios publico in Cancún. ■

Website: www.rubblemaster.com



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AMMANN	9	MANITOWOC CRANE	17
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CAMBUILD 2020	41	METALGALANTE	43
CATERPILLAR ASIA	19	MYANBUILD 2020	57
CHEMGROUT	29	PIACENZA EXPO SPA	51
COMANSA	3	POWER CURBERS	13
CCMA	39	ROBIT	25
CONEXPO-CON/AGG 2020	IBC	SAMBO	11
ENGINEER 2020	77	SNORKEL	45
GENERAC	31	SUCOOT	1
GEO CONNECT 2020	IFC	TADANO DEMAG	27
GOLDHOFER	59	TRENCHLESS ASIA 2020	35
GOMACO INTERNATIONAL	OBC	WIRTGEN	7
HAULOTTE	47	WOC 2020	2
INT'L CONSTRUCTION WEEK 2020	37	WORLDBEX 2020	6
JP NELSON	23	XCMG	5
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