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CONSTRUCTION

MARCH - APRIL 2018



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railway station

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Ituango hydroelectric power plant

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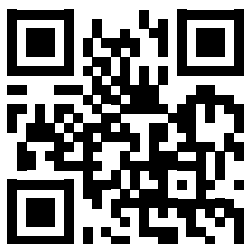
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Samsung C&T wins reclamation contract in Hong Kong

Samsung C&T has been awarded a US\$421 million reclamation contract by the Civil Engineering and Development Department (CEDD) in Hong Kong. The project will be carried out by a joint venture between Samsung C&T and local construction company Build King, and is part of CEDD's initiative to alleviate Hong Kong's housing shortage through the development of new towns.

The project will take place off the coast of Tung Chung on the northern part of Lantau Island as the first step in developing the area into a new town for approximately 270,000 residents, and will create 134 ha of reclaimed land. The construction was expected to begin in January 2018, with completion set by July 2024. Samsung C&T's 49 percent stake in the joint venture with Build King represents a US\$421 million interest in the US\$859 million contract.

Samsung C&T entered Hong Kong's construction market in 2012 with the Sha Tin to Central Link project, and followed by the Three Runway System Project Deep Cement Mixing Works in 2016. The latest contract represents Samsung C&T's third major undertaking in Hong Kong and simultaneously the city's emergence as one of the company's most important markets. ■



Samsung C&T will be working on a reclamation project in Hong Kong, which is part of CEDD's initiative to alleviate Hong Kong's housing shortage through the development of new towns.

ERE Consulting to participate in KL-SG HSR project

MyHSR Corporation Sdn Bhd (MyHSR Corp) has awarded the Social Impact Assessment (SIA) contract for the Kuala Lumpur - Singapore High Speed Rail (KL-SG HSR) project to ERE Consulting Group Sdn Bhd, following an open tender exercise that was launched in November 2017.

ERE Consulting Group will be responsible to complete an assessment on the possible social impact arising from the implementation of the project within Malaysia. The study will also include a heritage impact assessment to ensure that the project complies with the relevant policies and plans.

Dato' Mohd Nur Ismal Mohamed Kamal, CEO of MyHSR Corp said, "The appointed consultant will be responsible to assess the possible social impact arising from the three phases of the KL-SG HSR project, which encompasses the pre-construction, construction and operational phase. They will analyse all the feedback received from the Public Inspection exercise and will be conducting additional surveys and focus group discussions along the alignment."

"From the assessment, effective mitigation measures will be formulated in order to further minimise any identified social impacts to the affected communities. MyHSR Corp will continue to work closely with PLANMalaysia for the preparation of the SIA study and is committed to adopt the highest standards for the development of the project in a safe and sustainable manner," he added.

ERE Consulting Group has experience in conducting social impact assessments for equivalent projects in Malaysia, such as the Sungai Buloh – Kajang MRT Line, the Sungai Buloh – Serdang – Putrajaya MRT Line, and the East Coast Rail Link (ECRL) Phase 1 and Phase 2.

Eight stations are currently planned for the KL-SG HSR project namely: Bandar Malaysia, Sepang-Putrajaya, Seremban, Melaka, Muar, Batu Pahat and Iskandar Puteri stations in Malaysia and the Jurong East station in Singapore, with operations of the express service between KL and Singapore targeted for commencement by 31 December 2026. ■

Gomaco names new managing director for Asia Pacific



Dave George (left) has joined Gomaco as the company's new managing director for Asia Pacific. He will be responsible for the sale of Gomaco products and managing the distributor network within the region.

Mr George has an extensive history working within the construction industry and 3D machine control. He had been employed with Trimble since 2006, serving as application engineer, accounts manager and corporate solutions architect director. He has also worked at Align Wireless Solutions

as director of technology and field operations manager, at David Evans and Associates as GPS/GIS specialist and project manager, and at GeoLine Positioning Systems for survey and mapping sales.

"Dave brings a unique and specialised set of skills to Gomaco with his understanding of 3D machine control systems, engineering principles and the ability to work with a variety of people and personalities," said Kent Godbersen, Gomaco's vice president of worldwide sales and marketing. "We are confident he will represent the Gomaco product line well in the Asia Pacific region while providing excellent sales service. We look forward to introducing him to our many customers in the region." ■

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Public sector to boost Singapore's construction demand

Singapore's total construction demand (value of construction contracts to be awarded) is expected to range between S\$26 and S\$31 billion in 2018, higher than the preliminary estimate of S\$24.5 billion in 2017, according to the Building and Construction Authority (BCA).

The projected higher construction demand is due to an anticipated increase in public sector construction demand, which is expected to grow from S\$15.5 billion in 2017 to between S\$16 and S\$19 billion in 2018. This contributes to about 60 percent of 2018's total projected demand, said BCA.

The private sector's construction demand is also expected to improve from S\$9 billion in 2017 to between S\$10 and S\$12 billion in 2018, thanks to a strengthened overall economic outlook and the upturn in property market sentiment.

Among the projects slated to be awarded this year include: 1) Residential projects - a steady pipeline of new public housing construction, upgrading works for HDB flats, and a number of upcoming sizeable condominium projects earmarked for development at Shunfu Road, Stirling Road, Hougang Avenue 7 and Upper Serangoon Road; 2) Commercial projects - major upcoming office building projects planned for development are likely at locations such as Central Boulevard and Harbour Drive; 3) Industrial projects - an automotive hub at Jalan Terusan and a multi-storey recycling facility in northern Singapore; 4) Institutional and other building projects - more healthcare facilities including the redevelopment of National Skin Centre at Mandalay Road and Woodlands Integrated Health Campus, various educational facilities for Institutes of Higher Learning (IHL), as well as private sector investments in developing nature based attractions and recreational facilities for tourists at Mandai Park; and 5) Civil engineering projects - major contracts for the North-South Corridor, new MRT works and Deep Tunnel Sewerage System (DTSS) phase 2, as well as rolling out of the remaining package for Runway 3 by Changi Airport Group.

Furthermore, projects prescribing Design for Manufacturing and Assembly (DfMA) technologies have also become more prevalent in recent years, added BCA. The number of DfMA projects to be put up for tender is expected to increase in 2019 as more of such projects are firmed up.

"Our built environment sector is in the midst of exciting transformation, leveraging new technology, higher skills and innovation in how we build Singapore," said Hugh Lim, CEO of BCA. "In 2017, we saw several 'firsts' in Singapore's built environment. The Wave at Nanyang Technological University became the first building in Southeast Asia to use Mass Engineered Timber (MET) on such a large scale, and The Brownstone Executive Condominium, developed by City Developments Limited and constructed by Teambuild Construction, is the first large-scale private residential development in Singapore to adopt the use of concrete prefabricated prefabricated volumetric construction (PPVC)."

Mr Lim continued, "With the widening adoption of advanced technologies, we saw continued improvement in site productivity which achieved an estimated growth of 2.1 percent last year, exceeding the 2 percent mark for the first time. This brings our cumulative improvement in site productivity to about 12 percent, since the beginning of our productivity journey in 2010."

Forecast for 2019 to 2022

BCA anticipates a steady improvement in construction demand



FAR LEFT: Desmond Lee, Singapore's Minister for Social and Family Development and Second Minister for National Development.

LEFT: Hugh Lim, CEO of BCA.



The Wave at Singapore's Nanyang Technological University is said to be the first building in Southeast Asia that has applied the Mass Engineered Timber (MET) technology on such a large scale.

over the medium term. It is projected to reach between S\$26 and S\$33 billion per annum for 2019 and 2020 and could pick up to between S\$28 and S\$35 billion per annum for 2021 and 2022.

The public sector will continue to lead demand and is expected to contribute S\$16 to S\$20 billion per annum in 2019 to 2022, said BCA, with similar proportions of demand coming from building projects and civil engineering works. Besides public housing developments and healthcare and educational facilities, public sector construction demand over the medium-term will continue to be supported by major infrastructure projects, which include various developments for Changi Airport Terminal 5 and land transport projects such as the Cross Island Line, Jurong Regional Line, Rapid Transit System and High Speed Rail.

BCA expects private sector construction demand to also increase gradually in the medium term, boosted by the redevelopment of en-bloc sale sites and the spill-over benefits generated by the improved performance and outlook in other economic sectors.

"We need to work together, build up capabilities and position our local firms to be competitive to seize future opportunities and face future challenges," said Desmond Lee, Singapore's Minister for Social and Family Development and Second Minister for National Development. "To help our firms do this, we have formed a Built Environment (BE) cluster sub-committee under the Future Economy Council (FEC)."

Mr Lee further highlighted that the sub-committee is fully a tripartite effort. It is a joint effort between the government, the industry, unions and the IHLs. "It oversees the Industry Transformation Maps (ITMs) for our Built Environment cluster. Each ITM is a growth and competitiveness plan that is meant to help local companies address current challenges and develop capabilities. The intent is to create good jobs for Singaporeans and position our firms to face competition," he said. ■



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Megawide joins Maynilad's water reclamation project

Megawide Construction Corporation has been awarded a design and build contract for Maynilad's new water reclamation facility in Las Piñas, the Philippines. Once completed, it will allow Maynilad to recover some 88 million litres per day (MLD) of potable water, which is expected to be sufficient to supply 88,000 households. Design and other pre-construction work on the Las Piñas facility were expected to begin in January 2018.

"The Megawide construction business will continue its expansion this year, starting with Maynilad's 88 MLD Las Piñas facility," said Edgar Saavedra, Megawide's group chairman. "We are actively seeking more projects outside the residential and commercial types to expand our portfolio."

Megawide partnered with Toshiba Group's UEM India Pvt Ltd

and local company LinkENERGIE Industries Co Inc to deliver the project's design and construction components. "We partnered with UEM and LinkENERGIE to ensure delivery of the highest quality standards. UEM brings solid international experience in creating water treatment facilities and we are looking forward applying their world-class standards to this project," said Mr Saavedra.

Megawide is consciously looking into projects that have a big impact on nation building following its multi-year diversification plan "This is a project that will greatly benefit Greater Manila and adjacent provinces," added Mr Saavedra. "We are proud to be a partner of Maynilad in this endeavour and we are looking forward to pursuing more projects in this industry." ■

MB Crusher strengthens in Indonesia with new distributor

MB Crusher is expanding into Indonesia with the appointment of a new distributor for the market, PT Universal Tekno Reksajaya (UTR), a subsidiary of PT United Tractors. The signing of the cooperation agreement was recently held at the Italian embassy in Menteng, central Jakarta (right).

The implementation of crusher machines is fundamental in mining and construction sectors, said MB Crusher, although some practical obstacles are faced by users of traditional crushers, such as location of mines compared to the site, the difficulty in assembling a static crusher, the mobility of the mobile crushers in the



cities and the ease of care and availability of spare parts.

MB Crusher provides breakthroughs to solve all constraints over conventional

solutions by presenting its bucket crusher concept, where the jaw crusher is operated as an attachment installed on the excavator and works with the power delivered by the excavator itself. This solution turns the MB Crusher machine into one part, with the excavator making the manoeuvring of the MB Crusher unlimited. Production of this attachment means better procurement times, more practical use and easier and cheaper maintenance, explained MB Crusher. The company added that the expansion of the infrastructure construction sector has increased the demand for crusher machines. ■

Megatrans acquires 'first ADDrive in Thailand'

Megatrans and Service Co Ltd based in Thailand offers heavy-duty transport solutions in various weight classes for both in-house crane logistics and challenging third-party transport operations. The company has recently received a THP module with ADDrive from German manufacturer Goldhofer - it is said to be the first company in Thailand that has acquired such vehicle.

"For us, the THP with ADDrive is the ideal reliable and time-saving solution for transporting heavy loads like cranes on routes that include sections with steep gradients," said Meatharphatt Tanawattanachaiyabul, managing director of Megatrans and Service Co Ltd. "The ability to choose between maximum tractive force and higher travel speeds gives us an outstanding flexibility with just one vehicle. With the switchable performance boost available with the ADDrive and the additional drop deck and turntable bolster for long loads, the module is a real allrounder."

According to Goldhofer, THP is the world's first modular transporter with an EBS braking system, which can be operated either alone or in combination with ABS. With its high bending moment, it is also a safe solution for carrying concentrated loads. ■



Jean Philippe Martin, Goldhofer's regional director of sales, hands over the new ADDrive to Meatharphatt Tanawattanachaiyabul, managing director of Megatrans and Service Co Ltd. Megatrans is said to be the first company in Thailand that has acquired a THP module with ADDrive.



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Gammon wins Hong Kong Lyric Theatre contract

Gammon Construction has been awarded a HK\$1.5 billion contract by the West Kowloon Cultural District Authority (WKCA) in Hong Kong to deliver the extended basement and public infrastructure works for the L1 Contract for Lyric Theatre Complex and Extended Basement at WKCD.

The L1 Contract for Lyric Theatre Complex and Extended Basement at WKCD involves excavation and lateral support followed by construction of a two-level reinforced concrete structure, as well as public infrastructure works including drainage, a traffic lay-by and associated temporary works.

Gammon will employ a number of innovations that improve safety and productivity in delivery of the works. These include modular components that can be fabricated at its offsite steel factory before being bolted together onsite without the need for welding. Its in-house instrumentation and monitoring team has also developed a bespoke system for the project to help monitor and manage movements and ensure the nearby Airport Express railway is not affected.

The project team will be further supported throughout the contract by other in-house divisions including the virtual design and construction department, which will develop the digital building information model and use other related technologies such as 3D scanning and 3D printing to assist in delivering the works to the highest standards of accuracy and quality.

The Lyric Theatre forms part of the West Kowloon Cultural District development, which aims to establish a vibrant world-class cultural quarter on Hong Kong's harbour front that blends art, education and public space. Work on the project is due to commence in early 2018 and is expected to be substantially complete by mid-2020. According to Gammon, a workforce of 450 will be engaged at the peak construction period. ■

SMEC to help alleviate traffic congestion in Manila

SMEC, as part of a joint venture led by Oriental Consultants Global Company Limited, has been appointed as general consultant to manage and supervise the construction of the North-South Commuter Railway (NSCR) Project in the Philippines.

Funded by the Japan International Cooperation Agency, the NSCR is a 38 km long commuter railway line that connects Malolos in the province of Bulacan to Tutuban in Manila. It is part of an overall initiative by the Philippine government to expand the existing mass transportation in metropolitan Manila and adjacent areas, and alleviate serious traffic congestion in and around the capital city.

SMEC's scope of work includes: construction supervision; design review; tender assistance; and facilitation of the Environment Management Plan, Environment Monitoring Plan and Resettlement Action Plan. SMEC was also part of the joint venture that successfully completed the civil works design last year. ■

Apex Property launches luxury chalet development in Japan



Hong Kong-based boutique developer Apex Property has launched a new luxury chalet and land development project in Japan, named Hanaridge (above). It will be located in one of the country's most famous ski destinations, Niseko.

Spanning over 26,000 sq m, Hanaridge is a prime piece of land set to be divided into 12 plots for building luxury chalets. It is said to be the first ski-in luxury chalet collection in Niseko, with lots ranging from 1,000 to 3,000 sq m and the potential to build a three-storey luxury chalet ranging from 280 to 700 sq m. ■

Aoki Juki adds Demag AC 700-9

Japan-based crane specialist Aoki Juki Co Ltd is expanding its operations with the addition of a new Demag AC 700-9 all terrain crane (below). This order will be the third AC 700-9 unit Aoki Juki has in its fleet, further enhancing the company's ability to meet customer needs.

The Demag AC 700-9 is the most compact crane in the 700-t class, according to Terex Cranes, with a maximum system length of 149.5 m. To meet Japanese regulations, the existing AC 700-9 has been modified into an eight-axle chassis with quick assembly/disassembly of boom and superstructure.

Established in 1954, Aoki Juki employs 80 people and specialises in laying railway tracks, constructing and dismantling bridges, as well as transporting and handling heavy goods. The company operates 18 Terex and Demag various all terrain crane models. ■



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First office tower at Paya Lebar Quarter tops out

Paya Lebar Quarter (PLQ), which is being developed by Lendlease, recently reached a major milestone with the topping out of its first office tower. The S\$3.2 billion mixed-use development is in full swing and upon completion, it will transform Paya Lebar into Singapore's newest business hub. Construction started in January 2016 and buildings are planned to be progressively completed from the third quarter of 2018.

PLQ's three office towers will provide close to 1 mil sq ft of Grade A prime office space. Currently over 50 percent of this space is either leased, under final offer or in advanced negotiations, according to Lendlease. Tower 1 and 2 will have 14 floors each, while Tower 3 has 13 floors. The office towers are expected to be occupied from September 2018.

"Thanks to the hard work and dedication from our designers, construction team and 1,200-strong workforce on site, we are well on track to completing PLQ, with the buildings due to be progressively completed from September," said Richard Paine, PLQ managing director, Lendlease.

"As PLQ takes shape, the revitalisation of the broader adjoining areas are also being completed and contributing to the transformation of Paya Lebar. With forecast annual footfall of 45 million on completion, PLQ will be part of a strong centre, integrated with dual MRT lines, bus, taxi, pedestrian and PCN networks."

The new 4-ha PLQ office, residential, leisure and retail development is expected



LEFT: The construction of Paya Lebar Quarter is progressing well and when completed, it will transform Paya Lebar into Singapore's newest business hub.

BELOW: Thriving banyan saplings, cultivated from the original banyan tree on the site, were lifted to the roof of the project's Tower 3 to signify the topping out of the building.



ABOVE: The guest of honour, VIP and Lendlease executives viewing the masterplan model of PLQ at the topping out ceremony in January 2018.



to be one of the largest business and lifestyle precincts in Singapore. The PLQ mall is due to be occupied from late 2018. Over 400 new apartments are also being developed at PLQ, the first phase of which was launched in March 2017 and the second phase is anticipated to be released in the coming months.

Leveraging Lendlease's expertise in urban regeneration, PLQ is a key catalyst to the plans to transform Paya Lebar into

a bustling, pedestrian-friendly new city precinct and a dynamic business hub. The development will also provide walking and cycling paths integrated into the wider Park Connector Network (PCN).

PLQ is one of 13 major urban regeneration projects across key international gateway cities undertaken by Lendlease, as part of its global development pipeline estimated at over S\$50 billion as at 30 June 2017. ■

Kinshofer acquires Doherty Group

Kinshofer, one of the world's leading sources of high-quality excavator and loader crane attachments, has acquired Doherty Group, a New Zealand-based excavator attachment manufacturer. The entire Doherty management team will stay with the company and Doherty Group co-owner and managing director Jeremy Doherty will remain as its managing director.

"Acquiring Doherty Group was the next step in our approach to be a local manufacturer in New Zealand and Australia," said Thomas Friedrich, Kinshofer's group president and CEO.

Doherty, a family business established in 2001, focuses on developing and marketing attachments and equipment that enhance the effectiveness and versatility of carriers. This is particularly important for small- and mid-sized contractors seeking high equipment utilisation. The acquisition adds additional

product segments to Kinshofer's range, including quick couplers, buckets and other excavator products. It also improves Kinshofer's distribution channels in New Zealand and Australia and enhances local manufacturing through Doherty's Tauranga, New Zealand and Brisbane, Australia-based facilities.

Doherty will continue to develop and sell its products globally. Anticipating increased opportunity and demand, Doherty and Kinshofer will expand their sales and production staff to ensure swift integration of the products throughout both organisations.

"The concentration of knowledge and competence between our companies provides a platform and expertise that will enable rapid and responsive product development to meet new customer challenges," said Jeremy Doherty, Doherty Group's co-owner and managing director. ■



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Work on Office Tower 1 at OneHub Saigon starts

Ascendas-Singbridge and its joint venture partner, Saigon Bund Capital Partners, have commenced construction works for Office Tower 1 at OneHub Saigon, a fully integrated business park located within Saigon Hi-Tech Park in Ho Chi Minh City, Vietnam.

Tower 1, with gross floor area of approximately 12,000 sq m over six floors, is expected to start operations from first quarter of 2019 and will comprise office spaces with international standard specifications and property management service. Developed in consultant with Sydney-based PTW Architects (architecture), CPG Consultants (civil, structural and MEP), Colin K. Okashimo and Associates (landscaping), G-Energy Global (sustainable), and constructed by main contractor Cotecons, Tower 1 is the first LEED Silver Certified Office Building in District 9, Ho Chi Minh City.

OneHub Saigon aims to provide a seamless and vibrant work-live-play-learn environment for its tenants and the surrounding community. The 12-ha development will comprise seven office towers, a mixed-use commercial block, work-office home-offices, an education centre and recreational amenities built with sustainable features.

Together with existing international corporations such as Samsung, Intel, Schneider, Sanofi and others located within Saigon Hi-Tech Park, OneHub Saigon will play an integral role in supporting the business ecosystem. It is conveniently connected via Hanoi Highway and within walking distance to the Metro Station, providing tenants with easy access to key locations such as Tan Son Nhat International Airport and the Central Business District. ■

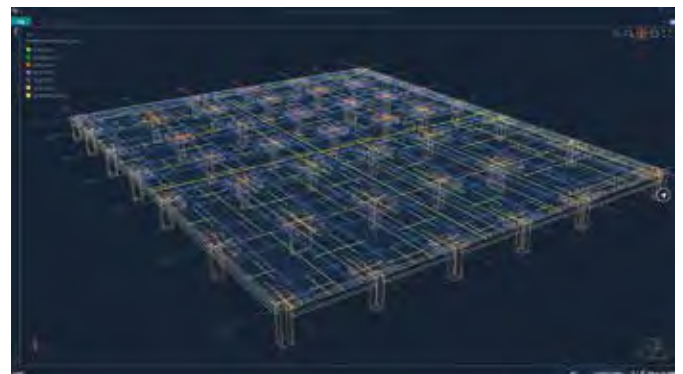
Bentley acquires S-Cube Futuretech

Bentley Systems has acquired Mumbai, India-based concrete building design and documentation software company S-Cube Futuretech Pvt Ltd. The addition of S-Cube Futuretech's applications expands Bentley's offerings specific to the needs of concrete engineering design and documentation software users in India, Southeast Asia and the Middle East.

S-Cube Futuretech's applications, including RCDC, RCDC FE, RCDC Plan and Steel Autodrafter, deliver flexible and powerful design and documentation solutions for structural concrete building engineers and designers. Automated concrete documentation is localised to regional requirements and provides users with compelling value and capabilities, which are complementary to Bentley's widely used structural analysis, steel design, and BIM applications, STAAD, RAM and AECOsim Building Designer.

"More than two billion people will fill the world's cities over the next 30 years. This growth will continue to be concentrated in the developing markets of Asia, particularly India, China and Southeast Asian countries. Efficient, automated, concrete design and detailing tools will be instrumental to every nation's ability to address this demand," said Raoul Karp, Bentley's vice president of design engineering analysis.

Since 2014, Bentley Systems and S-Cube have collaborated to develop fully integrated concrete design and analysis applications. The acquisition brings together the knowledge base of S-Cube



Reinforced concrete slab design using RCDC FE.

and Bentley's respective teams of experts, representing decades of combined industry experience to provide advanced structural design and analysis technology.

Sajit Nair, CEO of S-Cube Futuretech said, "As a global leader in the structural analysis and design space, Bentley brings state-of-the-art BIM and structural analysis technology, a strong user-centric ethos, and global market experience that will help scale our solutions to a much broader market. We are excited about bringing more functionality and capabilities to more users globally, in a shorter timeframe than we would have been able to otherwise." ■

AECOM to provide site supervision services for Malaysia's East Coast Rail Link project

AECOM has been appointed by China Communications Construction Company to provide site supervision services for the stations, viaducts, tunnels and depots of the East Coast Rail Link (ECRL) project in Malaysia. "Such massive rail infrastructure will open up new opportunities for the people in the East Coast states by facilitating the creation of new jobs, stimulating industries and enhancing mobility, in tandem with the growth that is being driven by the East Coast Economic Region initiative," said Patrick Wong, Malaysia country director at AECOM.

The ECRL project is part of the Malaysian government's

comprehensive transportation plan and will link Kuala Lumpur and Port Klang to the East Coast through a strategic railway network. It is envisaged to serve all the main hubs of the East Coast Region, traversing Kelantan, Terengganu, Pahang and parts of Selangor, and be connected to Malaysia's main rail network by the time it is completed in 2024.

"This project is also a great opportunity to further grow local talent in this field and create rail industry leaders whose expertise are very much sought after globally," said Billy Wong, Southeast Asia regional executive at AECOM. ■

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Arup-Henning Larsen JV to deliver Icone Tower in Manila

Arup and Henning Larsen Architects have signed a joint venture (JV) contract to deliver the detailed architectural and engineering design of the Icone Tower, a new iconic skyscraper in the heart of Manila that will pay tribute to the Filipino soldier. It is located in Bonifacio Global City, a business district developed from former army camp, Fort Bonifacio.

The tower is envisioned as an edifice that honours and recognises the service of the members of the Armed Forces of the Philippines (AFP) – the biggest stakeholder of the Bases Conversion and Development Authority (BCDA), client of the Arup-Henning Larsen for the Icone Tower.

At 275 m tall, the 40-storey structure will host areas dedicated to the Filipino troops, public plaza that promote engagement, exhibition and conference spaces, a rooftop observatory, dining facilities and a new corporate office for the BCDA.

The large public plaza at the tower base is one of the distinctive features - used for activities and social gatherings, an important part of the Filipino culture - with a canopy of trees designed in alignment with local climate to provide both shade, shelter and the ambiance of a Filipino tropical forest.

As a structure that promotes humanity, the Icone Tower is designed to set an example of how a tall building should give back to a city and its people with the ambition of revitalising an entire urban area.



FAR LEFT, LEFT AND BELOW: At 275 m tall, the 40-storey Icone Tower will be a new landmark in the heart of Manila, designed to pay tribute to the Filipino soldier.

BOTTOM: The contract signing between Arup and Henning Larsen Architects.



All rendering images © Henning Larsen

The project will be designed out of Henning Larsen's Hong Kong office led by design director Claude Bøjer Godefroy and managing director Elva Tang, with

Arup providing total engineering services from Hong Kong and Manila offices led by director YL Cheng. It is expected to be completed by end of 2021. ■

JCB appoints new dealer in Singapore

Aly Energy has been appointed as JCB's sole dealer for Singapore. Based in Tuas, Aly Energy seeks to closely align JCB's global renown with its considerable local expertise in driving awareness of the entire family of JCB machines to customers in the key construction and shipyard sectors.

"We are looking forward to working with JCB on our home territory," said Albert Foo, executive director corporate strategy at Aly Energy. "As a top three global brand, JCB has instant recognition for its robust, reliable and hardworking machines, which - combined with the strength of its 'made in the UK' cachet - creates exceptional selling points with both existing and prospective customers.

"JCB's machines - with their multi-tasking capabilities, simple operation, easy maintenance and ability to reduce downtime - provide an outstanding partnership with Aly Energy's unique strategic knowledge of Singapore's construction technology requirements," commented Max Lytle, managing director of JCB

Southeast Asia. "This partnership is yet another important element of JCB's regional strategy and clear evidence of our commitment. This will include enabling easy accessibility for customers to essential spares from our premium regional facility located within the local Changi International Airport."

Aly Energy promises to bring fresh technical expertise and related services to its target sales sectors. Mr Foo, who is charged with special responsibility for the JCB portfolio, identifies that there are significant opportunities available. "Once we have reinforced the branding, our long-term aim together with our JCB partners is to capture key product market share year-on-year; with an unequivocal vision to establish JCB as the premium brand in Singapore." The machines that Mr Foo confidently expects to spearhead JCB's future preeminence, based largely on their exceptional productivity and durability, include the Loadall telehandlers, tracked excavators, compaction rollers and skid steer loaders. ■

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New residential projects in Vietnam and China

Keppel Land has entered into agreements to acquire 100 percent interest in two prime sites in Ho Chi Minh City (HCMC), Vietnam. One of the sites is located in Saigon South, where Keppel Land plans to develop about 220 landed homes and a 1,029-unit high-rise condominium spanning a gross floor area (GFA) of about 36,110 sq m and 141,540 sq m respectively. The 13-ha site will enjoy easy accessibility to HCMC's central business district (CBD). The total development cost is about US\$235 million.

The other site is located in District 9 and borders the affluent residential enclave of District 2. Keppel Land plans to develop another 300 landed homes spanning a GFA of about 55,000 sq m. The total development cost for the 6-ha site is about US\$62 million.

"Vietnam's housing demand is expected to continue its upward momentum, supported by the country's young population, growing

middle-class as well as rising urbanisation. We are confident that these two developments will be well sought after, given the limited supply of upper middle-end gated landed homes and condominiums close to HCMC's CBD," said Ang Wee Gee, CEO of Keppel Land.

In addition, Keppel Land China, through its wholly-owned subsidiary, Keppel Lakefront (Wuxi) Property Development Co Ltd, has secured a prime 18.03-ha residential site in Wuxi, China, for a total consideration of RMB2,533 million in a government land tender. Located in a mature residential precinct within the Xinwu district, the site has a permissible GFA of about 360,500 sq m. Keppel Land China plans to develop the site into a residential project comprising 2,053 high-rise, 456 mid-rise and 246 low-rise units. ■

Nishio Rent All expands facility in Vietnam

Nishio Rent All Vietnam Co Ltd has relocated its Hanoi branch to a new, larger facility - from Lot CN4.1 Thach That Quoc Oai Industrial Zone, where the company started its business, to the KM 18 Lang Hoa Lac Street, Quoc Oai District, in the same industrial zone.

Established in 2012, Nishio Rent All Vietnam offers comprehensive rental services for construction machinery in the Vietnamese market. After more than five years of operation, the company saw the need to expand its facility.

The new site features approximately 3,500 sq m, including an office, a factory and a yard. Apart from providing a better working environment for its staff, the company can now accommodate a well-equipped maintenance workshop centre in order to improve its service quality and also to increase the number of machines in its rental fleet.

Nishio is a leading provider of construction equipment rental in Japan, Vietnam, Malaysia, Thailand, Singapore and China. The company currently has a total workforce of over 3,000 employees across 399 branches. ■



Nishio Rent All Vietnam Co Ltd has relocated its Hanoi branch to a new, larger facility.

HxGN SMART Build to support Singapore construction projects

HxGN SMART Build has been awarded a grant under Singapore's Construction Productivity RD&D Grant Call for Building Information Modelling (BIM) and will serve as a collaboration platform to support Virtual Design & Construction (VDC) practices for selected construction and infrastructure projects across the country.

Singapore's Building and Construction Authority (BCA) initiated the grant in March 2017 as part of its drive to integrate stakeholders across the construction value chain through BIM collaboration and VDC practices in Singapore.

PPM demonstrated SMART Build's powerful functionality for multi-party collaboration, visualisation and issue/task-based tracking and management. The solution also supports VDC practices, where the project partners are expected to collaborate closely to achieve best project outcomes by identifying and resolving issues in real-time before actual construction gets underway, by introducing work packaging to efficiently and transparently assign work to the field, track progress and issues in real-time to reduce rework, make timely decisions and improve productivity.

Mattias Stenberg, president of Hexagon PPM said, "Hexagon PPM is focused on helping our customers in the architecture, engineering and construction market realise the benefits of smart digital facilities and city infrastructure. We look forward to working with the BCA to shape change in building and construction across Singapore."

HxGN SMART Build is a cloud and mobile construction management solution that intelligently links model, schedule and cost information to optimise construction planning and execution.

Hexagon PPM is one of world's leading providers of asset life cycle solutions for design, construction and operation of industrial facilities. PPM is part of Hexagon, a leading global provider of information technology solutions that drive productivity and quality across geospatial and industrial landscapes. ■

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Surbana Jurong secures major projects in Asia Pacific

Surbana Jurong has signed a Memorandum of Cooperation (MOC) with the Bases Conversion and Development Authority (BCDA) and Japan Overseas Infrastructure Investment Corporation for Transport and Urban Development (JOIN) to deliver the New Clark City project in the Philippines. Under the agreement, Surbana Jurong will assist BCDA and JOIN in drafting the development management framework, design standard guidelines and environmental guidelines to complement the masterplan of the project.

This collaboration marks the full implementation of New Clark City anchored on the Comprehensive Master Development Plan developed by BCDA and JOIN, in partnership with urban planning and engineering firms AECOM, Nippon Koei and Philkoei International.

Surbana Jurong will also help in utilising public-private partnerships to entice investors to New Clark City. It will also advise in the implementation plan of pioneer developers in New Clark City such as Filinvest Land, Inc.'s mixed-use industrial real estate developments, and MTD Capital Berhad's National Government Administrative Centre. Surbana Jurong will establish the framework of a smart city concept that will have fully integrated infrastructure and utilities for power, water, sewerage, information and communication technology (ICT), security and traffic management.

At the same time, JOIN's president and CEO Takuma Hatano recognised the significance of the Manila-Clark Railway (PNR North Railway) project in developing New Clark City as one of Japan's biggest projects in the Philippines. The 106-km alignment will connect Tutuban, Manila to the Clark International Airport and New Clark City. "The railway will immensely benefit commuters as it will cut down travel time from Manila to Clark in an hour, from the current 2-3 hours' travel time," he said, and added that the railway is designed to accommodate around 350,000 passengers per day.

The first phase of the project is expected to be completed in 2021. The Manila-Clark Railway is being implemented by the Department of Transportation in partnership with BCDA, and will be funded through Japan's official development assistance. The feasibility study and the detailed engineering design for the railway will be funded by the Japan International Cooperation Agency (JICA).

The 9,450-ha New Clark City is envisioned to be a new metropolis that will rise in the Clark Special Economic Zone, in Capas and Bamban, Tarlac. It is designed to be the country's first smart, green, disaster-resilient city, where nature, lifestyle, business, education and industries converge, and will be at par with other modern cities in the world.

New Clark City will feature mixed-use real estate developments for housing, a business continuity centre that would also house national government agencies, an agro-industrial park and an international food market. The city will have wide pedestrian lanes, exclusive bicycle lanes, and an integrated mass transit lane. Phase 1 of the project is expected to be completed in 2022.

In another development, Surbana Jurong Myanmar and MOSB Ltd have signed an agreement to design an offshore supply base (OSB) in Mon State, Myanmar. MOSB received approval from the Myanmar Investment Commission in July 2017 to construct and operate an OSB in Mon state.

Under the agreement, Surbana Jurong will be providing engineering and marine consultancy, environmental social impact



ABOVE AND LEFT: **Surbana Jurong** has signed an agreement with BCDA and JOIN to deliver the New Clark City project in the Philippines. The 9,450-ha development is set to be the country's first smart, green, disaster-resilient city.

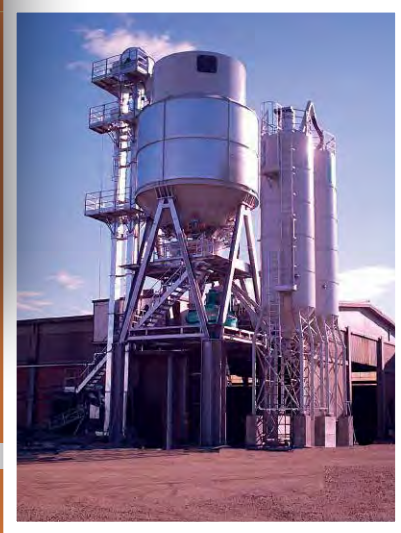


Surbana Jurong has also signed agreements with MOSB Ltd (above left) to design an offshore supply base in Myanmar, as well as with the Australian city of Townsville (above right) to collaborate in various areas.

assessment (ESIA) study and project management to support MOSB in the development of the OSB. "In view of the anticipated demand, the establishment of a supply base will support the fast-growing oil and gas industry in Myanmar and further advance the industry by reducing travel distances and increasing efficiency," said Teo Eng Cheong, CEO International (Singapore, Southeast Asia, North Asia) of Surbana Jurong Private Limited. "This planned facility in Mon state will provide a wide range of services to the Myanmar-based oil and gas operators in the waters off the coast in the Bay of Bengal, instead of having to travel to Singapore or Thailand, where the nearest platforms are located."

As part of Surbana Jurong's continued efforts to support Myanmar in its growth journey, the company will be awarding scholarships to three top students from Mandalay Technological University. Surbana Jurong Myanmar also organised its inaugural Infrastructure Forum on 26 January 2018 in Yangon, bringing together regional industry experts to explore topics centred around the outlook of Myanmar Infrastructure market, funding options as well as technical knowledge sharing.

Furthermore, Surbana Jurong has signed an MOC with the Australian city of Townsville to collaborate in various areas, with the aim of developing the city into a vibrant, smart and connected hub. Under the agreement, Surbana Jurong will work with the city on economic, community and social innovation focused initiatives, including providing consultancy on the digitisation of Townsville and growing aviation links to Singapore. ■



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Atkins wins competition for Gerbang Nusajaya's TOD

UEM Sunrise Berhad recently announced that Atkins has won the International Land Use Master Planning Competition for Gerbang Nusajaya's Transit-Oriented Development (TOD) plot. The developer said Atkins was selected based on its practical and sustainable design for the TOD plot that surrounds MyHSR Corporation Sdn Bhd's Iskandar Puteri High Speed Rail (HSR) station in Gerbang Nusajaya, Malaysia.

"We will soon commence the detailed planning and submission for the TOD surrounding the Iskandar Puteri HSR station," said Anwar Syahrin Abdul Ajib, UEM Sunrise's managing director and CEO. "Together with our strategic stakeholders, we hope to unlock the full potential of Gerbang Nusajaya in the lead up to the completion of the HSR station and to also ensure that we sustain our success by developing the communities through the value propositions of the master plan that will serve the people and our future generations. I am confident that the Gerbang Nusajaya's TOD holds tremendous potential for Iskandar Puteri as well as the southern region of Malaysia."

The architectural concept designs of the seven stations in Malaysia for the Kuala Lumpur-Singapore High Speed Rail (KL-SG HSR) were unveiled in October 2017, namely Bandar Malaysia, Sepang-Putrajaya, Seremban, Melaka, Muar, Batu Pahat and Iskandar Puteri.



Atkins has won the International Land Use Master Planning Competition for Gerbang Nusajaya's TOD plot. It is planned to be developed in parallel with the Iskandar Puteri HSR station (above).

Gerbang Nusajaya's TOD is planned to be developed in parallel with the Iskandar Puteri HSR station. UEM Sunrise has committed to completing the TOD in time for the station to receive its first passengers once the KL-SG HSR becomes operational in 2026. The company is also continuing to explore potential collaborations with partners and stakeholders to jointly develop the TOD area. ■

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New skyscraper in Dubai



Saudi Arabia-based developer DarAlArkan (DAAR) is developing a new AED 800 million residential project in Dubai (above), situated on the Dubai Water Canal in the Business Bay area. The 34-storey waterfront skyscraper, named 'I Love Florence', was designed by VX Experts. DAAR has also appointed La Casa Engineering Consultants to be part of the project team. Construction work was scheduled to start in January 2018. ■

Bauer to expand wetland treatment plant in Oman

Bauer has been awarded the contract to expand an industrial constructed wetland in Oman – it is believed to be the world's biggest - on behalf of Petroleum Development Oman (PDO), a leading oil and gas exploration and production company in the country. The plant's first stage was completed in 2011 by the local subsidiary of Bauer Resources GmbH, Bauer Nimr LLC.

The wetland treatment technology is utilising gravity-flow and natural processes to remove a heavy load of hydrocarbons from the water. The facility covers an area of 10.5 sq km. In addition to the innovative treatment performance, with the hydrocarbon content in water being reduced to below 0.5 ppm at the outlet of the wetlands, almost 95 percent of the crude oil entering the facility is recovered or removed without the use of electricity or chemicals.

Following an expansion in 2014, approximately 115,000 cu m can now run through the plant every day. Furthermore, the desert site has been converted into a home to more than 140 species of animals, including a multitude of birds, fish and reptiles.

The commissioned expansion will now see the plant's capability being expanded by 60,000 cu m per day to reach a total capacity of 175,000 cu m per day. Bauer Nimr will be responsible for designing, constructing and operating the plant until 2044. The entire project is worth over €160 million, and the construction works amount to about one-quarter of the total volume. Construction is expected to be finished by the end of 2019, after which Bauer will operate the plant on a 25-year basis. ■



Bauer has been awarded the contract to expand an industrial constructed wetland in Oman.

Allu has new distributor in Australia

Allu has appointed RD Williams (RDW) – a division of Qld Rock Breakers - as its new distributor for the Australian market. RDW will be supplying a comprehensive range of Allu Transformer and Processor attachments, as well as providing full aftermarket care, spare parts and dedicated customer service.

Based in Brisbane, Queensland, RDW was founded in 1988 by Rod Williams and Dick Karreman. The company serves its clients nationwide and is considered to be an industry leader when it comes to earthmoving equipment solutions.

RDW will provide 'point of contact' for Allu's local customers and when necessary, the company will be able to call on round the clock assistance from Allu's technical support department based in Finland, allowing the customers to benefit from specialised advice and assistance. ■



RDW is now Allu's distributor for the Australian market.

Leighton Asia to work on Hong Kong airport project

Leighton Asia, with joint venture partner Chun Wo Construction and Engineering Company Limited, has been selected by the Airport Authority Hong Kong to construct the Terminal 2 (T2) foundation and carry out substructure works at the Hong Kong International Airport.

Leading the joint venture, Leighton Asia will deliver the foundations for the modified T2, two annex buildings and associated viaducts, construction of the T2 basement, south annex building structures, diaphragm walls, utility services and other advance works.

Construction was scheduled to commence in late 2017 and is expected to complete by December 2021. ■

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Arup enhances capabilities with senior appointments



Arup has appointed Tai Chong Chew (left) as its global rail leader. Based in the UK, he will work closely with interim leader, Anna Squire, to establish Arup's rail business as the world leader in the sector.

Mr Chew joins Arup from Samsung Construction & Trading Corporation, where he was president of global business operations. "My focus will be helping our clients move beyond immediate project delivery, to considering the whole lifecycle of their rail infrastructure projects," said Mr Chew. "Significant gains can be made by thinking about long-term asset maintenance and replacement from the outset. With the breadth of expertise available at Arup, we are well placed to deliver smart solutions that consider the whole-life perspective."

Mr Chew has more than 40 years' experience in delivering major railway infrastructure programmes around the world. While at the Land Transport Authority in Singapore, he delivered Asia's first fully automated underground heavy metro system, the North East MRT line. Mr Chew was responsible for all new railway projects in Hong Kong during his time at MTR Corporation, including the West Island Line and the fully automated South Island Line. During his time at Bombardier Transportation as head of mass transit in the UK, he was responsible for major projects including the London Underground Victoria Line upgrade.

In Singapore, Arup has also appointed digital strategy and solutions specialist Kevin Koh, and city and transport planning specialist Neil Walmsley to lead its digital services and cities and planning teams in the country respectively.

With more than 23 years of experience in the industry, Mr Koh joins Arup as a market leader, particularly in the creation and implementation of vertical solutions plans for national governments. He also takes a personal interest in working with young start-ups who are developing the drone, video analysis and robotics capabilities of tomorrow. Mr Walmsley brings with him more than 20 years of global planning and design experience. With his move to Singapore, Arup's cities and planning team will bring together a holistic range of specialist technical and advisory services across all aspects of the built environment including sustainability, resilience, policy, economics, urbanism, transport planning, site development, logistics, operations and digital. ■

Florian Bauer joins Bauer AG management board



Florian Bauer (left) has joined the management board of Bauer Aktiengesellschaft (Bauer AG), as of 1 January 2018. He has worked at the company since 2011.

Mr Bauer started as project engineer at Bauer Spezialtiefbau GmbH, during which he was responsible for several large projects in Malaysia and partly managing the subsidiary in Singapore. He has been managing director of Bauer Spezialtiefbau since 2015 and is responsible for the technical division and the competence areas 'digital building', innovation as well as research and development.

Mr Bauer will take over the functions of digitalisation, development coordination, training and corporate culture on the management board but will remain managing director of Bauer Spezialtiefbau and a portion of his task areas there remain unchanged.

According to Bauer, the topic of digitalisation is always growing in priority within the company. An important driving force for digitalisation in construction is Building Information Modelling (BIM). This trend will continue to grow in mechanical engineering and influence many of the business processes. In order to promote a unified strategy throughout all parts of the company, the function has now been installed at Bauer AG under Mr Bauer, who was already responsible for implementation of the concept 'digital building' in the Construction segment.

"Digitalisation plays an ever more important role at Bauer, therefore it is even more important to have all group units pull together and turn these chances into a common success," said Mr Bauer. "I am equally pleased about my appointment in the management board as I am about the new challenges that come with this responsible role."

"As a family company, an employee-oriented and grounded culture is important to us," said professor Thomas Bauer, chairman of the management board of Bauer AG, "Therefore it is also important to the family that they are represented in the management board in the long term. I am particularly pleased that my son Florian has received high recognition in the company and was recommended for this task due to his technical expertise and his positive way of leading employees." ■

Kobelco Construction and Kobelco Cranes merge in Europe

Following the consolidation with Kobelco Cranes Co Ltd on 1 April 2016, Kobelco Construction Machinery Co Ltd (KCM) has been reorganising and consolidating its group companies across the globe. As part of this development, KCM will now implement a reorganisation of the business structure in Europe in order to improve efficiency, strengthen product development capabilities and effectively utilise management resources.

The sales and service of hydraulic excavators in Europe are currently carried out by Kobelco Construction Machinery Europe BV (KCME) in Almere, the Netherlands, while the sales

and service of cranes are handled by Kobelco Cranes Europe Ltd (KCE) in the UK. Following the reorganisation, KCME will serve as the European regional headquarters overseeing the sales and service of both hydraulic excavators and cranes in Europe. It will also serve Russia (CIS), North Africa (French-speaking regions) and Israel.

In addition, KCE will be renamed Kobelco Construction Machinery Europe (UK). The office will remain at its current location in East Grinstead, West Sussex, and the UK crane business will be unaffected. ■

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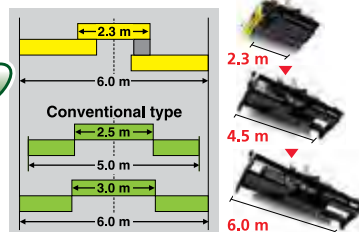
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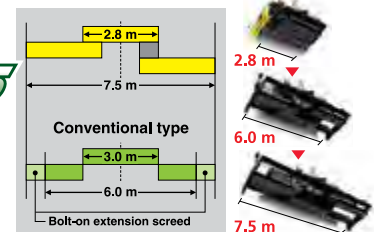
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Date	Events in Asia	Organiser & Contact
27 to 29 Mar 2018	Ecobuild Southeast Asia 2018 Kuala Lumpur Convention Centre Kuala Lumpur Malaysia	United Business Media (M) Tel: +603 2176 8788, Fax:+603 2164 8786 Email: ecobuild-sea@ubm.com Website: www.ecobuildsea.com
7 to 8 May 2018	Trenchless Asia 2018 Kuala Lumpur Convention Centre Kuala Lumpur Malaysia	Westrade Group Tel: +44 845 094 8066, Fax: +44 870 429 9275 Email: pharwood@westrade.co.uk Website: www.trenchlessasia.com
9 to 11 May 2018	Build4Asia 2018 Hong Kong Convention & Exhibition Centre Hong Kong	UBM HKES Tel: +852 2827 6211 Email: exhibit@build4asia.com Website: https://build4asia.com
24 to 26 May 2018	Concrete Show India 2018 Bombay Exhibition & Convention Centre Goregaon, Mumbai India	UBM India Pvt Ltd Tel: +91 22 6172 7155 Email: saiprasad.terde@ubm.com Website: www.concreteshowindia.com
7 to 9 Jun 2018	Laobuild 2018 National Convention Centre Vientiane Laos	AMB Tarsus Events Group Tel: +603 2692 6888 Email: rina@ambtarsus.com Website: www.laobuild.com
23 to 25 Aug 2018	LankaBuild 2018 Sri Lanka Exhibition & Convention Centre Colombo Sri Lanka	AMB Tarsus Events Group Tel: +603 2692 6888 Email: syed@ambtarsus.com Website: www.lankabuild.org
6 to 8 Sept 2018	Intermat ASEAN & Concrete Asia 2018 Impact Exhibition & Convention Centre Bangkok Thailand	Impact Exhibition Management Tel: +662 833 5315 Email: info@asean.intermatconstruction.com Website: www.asean.intermatconstruction.com
12 to 14 Sept 2018	Cambuild 2018 Diamond Island Exhibition & Convention Centre Phnom Penh Cambodia	AMB Tarsus Events Group Tel: +603 2692 6888 Email: charley@ambtarsus.com Website: www.cambuildexpo.com
19 to 21 Sept 2018	Concrete Show Southeast Asia 2018 Jakarta International Expo Kemayoran, Jakarta Indonesia	PT. UBM Pameran Niaga Indonesia Tel: +62 21 2930 5959, Fax: +62 21 2930 5960 Email: niekke.budiman@ubm.com Website: www.concreteshowseasia.com
20 to 22 Sept 2018	Banglabuild 2018 International Convention City Bashundhara Dhaka Bangladesh	AMB Tarsus Events Group Tel: +603 2692 6888 Email: syed@ambtarsus.com Website: www.tarsus.com/banglabuild
16 to 18 Oct 2018	BuildTech Asia 2018 Singapore Expo Singapore	Sphere Exhibits Tel: +65 6319 4021, Fax: +65 6319 6140 Email: buildtechasia@sph.com.sg Website: www.buildtechasia.com
16 to 18 Nov 2018	Myanbuild 2018 MEP Mindama Yangon Myanmar	AMB Tarsus Events Group Tel: +603 2692 6888 Email: ei@ambtarsus.com Website: www.myanbuild.net
27 to 30 Nov 2018	Bauma China 2018 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
11 to 14 Dec 2018	Bauma Conexpo India 2018 HUDA Ground Gurgaon, Delhi India	Messe München Tel: +49 89 949 20251 , Fax: +49 89 949 20259 Email: info@bcindia.com Website: www.bcindia.com

Date	Events outside Asia	Organiser & Contact
23 to 28 Apr 2018	Intermat 2018 Paris Nord Villepinte Paris France	Comexposium Email: communication@intermatconstruction.com Website: https://paris-en.intermatconstruction.com
26 to 28 Jun 2018	Hillhead 2018 Hillhead Quarry Buxton, Derbyshire UK	QMJ Group Ltd Tel: +44 115 945 4367 Email: hillhead@qmj.co.uk Website: www.hillhead.com
22 to 25 Jan 2019	World of Concrete 2019 Las Vegas Convention Centre Las Vegas, Nevada USA	Informa Exhibitions Tel: +1 972 536 6379 Email: info@worldofconcrete.com Website: www.worldofconcrete.com
8 to 14 Apr 2019	Bauma 2019 Munich Trade Fair Centre Munich Germany	Messe München Tel: +49 89 949 11348, Fax: +49 89 949 11349 Email: info@bauma.de Website: www.bauma.de
10 to 14 Mar 2020	Conexpo-Con/Agg 2020 Las Vegas Convention Centre Las Vegas, Nevada USA	Association of Equipment Manufacturers Tel: +1 414 298 4167, Fax: +1 414 272 2672 Email: international@conexpoconagg.com Website: www.conexpoconagg.com

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bauma Conexpo India to return in December 2018

bauma Conexpo India will be returning once again at the HUDA Ground in Gurgaon/Delhi, from 11 to 14 December 2018. According to the show organiser, there is a positive trend in all sectors of the construction machinery industry in India for years to come. "We expect this good development on the Indian market to be reflected in the next event," said Bhupinder Singh, CEO of bC Expo India.

bauma Conexpo India takes place every two years. The last edition, which was held from 12 to 15 December 2016, already indicated signs of a change of direction in the Indian construction machinery market, said the organiser. The show attracted 32,644 participants, with 647 exhibitors coming from 30 countries.

"We find that this is the best opportunity for Indian companies to show the international community what facilities India has," said Payal Koul Mirakhur, vice president of Invest India.



bauma Conexpo India 2016 attracted 32,644 participants, with 647 exhibitors from 30 countries.

"The success of bauma Conexpo India is a reflection of the overall upturn and positive outlook of the Indian construction

market. We sold several machines at the booth," said Wu Song, MD at Liugong. ■

Website: www.bcindia.com

Hillhead prepares for 2018 edition

The next edition of Hillhead will take place from 26 to 28 June 2018 at the Hillhead Quarry, near Buxton, the UK. The show is expected to welcome more than 500 exhibitors for the first time, said the organiser, with both outdoor and indoor space set to expand significantly.

A new 70-m-long structure will be sited alongside the existing Registration Pavilion to boost its capacity to 90 exhibitors, added the organiser. "With the Main Pavilion selling out before the end of last year and enquiries still flooding in, we have made the decision to extend again, creating the opportunity for an additional 30 exhibitors to attend," said Richard Bradbury, the event director.

According to the organiser, major industry players will include Terex Group, SMT (Volvo), JCB, Komatsu, Finning, Case, Sandvik, Hyundai, Bell, Liebherr, Doosan, Atlas Copco, Bomag, Wirtgen, McCloskey, Telestack, Hitachi, Metso, Parker Plant and CDE, together with other Hillhead regulars and a host of new companies.

"The level of rebooking has been exceptionally high and it is fantastic to see so many companies coming back to us year on year. It emphasises the importance of the show to the industry, which is a real highlight in the calendar for exhibitors and visitors alike," said Harvey Sugden, the event manager. ■

Website: www.hillhead.com



LEFT AND RIGHT: Scenes from Hillhead 2016.

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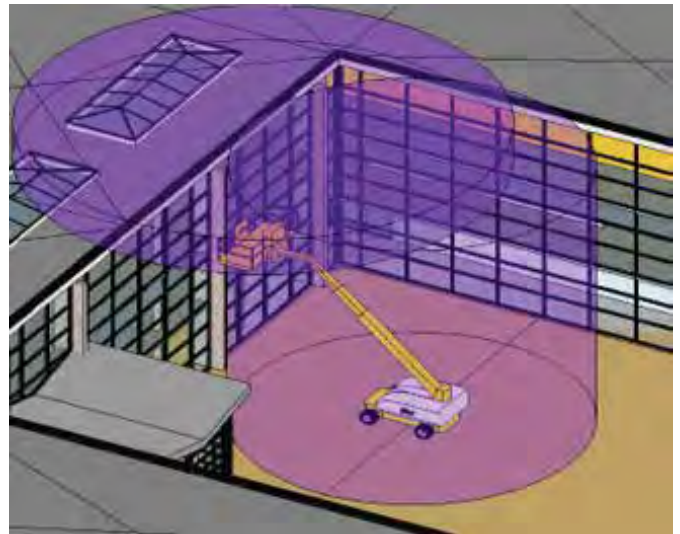
MEWPs now available in global BIM library

A selection of 3D virtual mobile elevating work platforms (MEWPs) and mast climbing work platforms (MCWPs) is now available in the National Building Information Modelling (BIM) Library with more to follow, thanks to the efforts of experts from the International Powered Access Federation (IPAF).

BIM is increasingly recognised and employed around the world by architects and project managers when designing new buildings and considering how they will be constructed and maintained. Now IPAF is also developing highly detailed and scalable 3D BIM MEWPs and MCWPs that can be used to visualise their use in the construction of new buildings or the conservation, repair or maintenance of existing structures before work gets underway. This allows for easier selection of the correct type of machine and also for managers to plan work more effectively and design better site risk assessments.

So far IPAF has had four virtual models produced and accepted into the National BIM Library for use in modelling projects around the globe. They include: MCWP; vertical lift; mobile boom – telescopic; and mobile boom – articulated. Three more are still in development and will be available soon, namely: static boom – spider type; static boom – vehicle mounted; and static boom – trailer mounted.

The models are each based on a typical, generic design as opposed to specific makes or models of machine, but all are adjustable for height and outreach so can be used to identify what type and capability of equipment is required by adjusting



MEWP BIM image.

the specifications to suit the intended task and checking things like reach and clearance.

The new IPAF MEWP and MCWP models can be found using the search term 'International Powered Access Federation' on the National BIM Library www.nationalbimlibrary.com/search. ■

IPAF to launch consultation on virtual reality and platform simulators

A global consultation is to be launched by IPAF to establish the possibilities for powered access training and safety guidance afforded by new technology such as virtual reality (VR) and platform simulators.

VR is now a reality and IPAF's worldwide network of almost 700 approved training centres are looking for guidance on how best to incorporate VR and the newest generation of simulators into training the more than 175,000 operators that obtain a PAL Card every year. IPAF will launch a major consultation exercise with all training centres to see how best the technology can complement IPAF's existing training programmes.

"There are lots of complex and potentially dangerous situations that can be experienced in a totally safe environment in



An IPAF VR headset.

the virtual realm, which would be difficult or even impossible to recreate safely in most other training environments," said Tim Whiteman, IPAF's CEO and managing director.

"Our aim is always to find ways in which modern technology can complement our existing eLearning and classroom-based training for operators and managers. Who better to take advice from, than the more than 1,000 accredited IPAF instructors around the world?"

Mr Whiteman added, "The consultation exercise will be addressed to all relevant stakeholders within IPAF's membership – manufacturers, training centres, rental companies, contractors, simulator developers and operators." ■

IPAF issues guidance on remounting MEWPs

IPAF's technical & safety department has issued global guidance on the remounting of second-hand MEWP equipment on a different chassis. The guidance emphasises the difficulty and high level of engineering expertise required to mount MEWPs on a chassis other than those for which they were originally designed, cautioning that 'failure to mount or re-mount a MEWP correctly can and has led to serious accidents worldwide'. ■

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Vermeer vibratory plow and mini skid steer

The new Vermeer SPX25 vibratory plow is designed for fast and efficient cable/fibre and irrigation system installation. It features a full-function remote control that gives the operator a 360-degree view of the jobsite, helping to avoid potential obstacles and an unobstructed view of the product being installed.

The unit is powered by a 25 hp Kohler gas engine that provides ample power for installing small pipes and cables at depths up to 30.5 cm, as well as for boring underneath driveways and sidewalks using the optional Porta Bore attachment. The dual rubber tracks with a ground pressure of 3.7 psi on the SPX25 plow delivers great floatation in soft ground conditions and helps reduce jobsite restoration after an install. The lightweight plow offers a quick transport speed of 6 km/hr.

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

In addition, Vermeer has expanded its compact equipment lineup with the new S925 mini skid steer. Having a tip capacity of 1,198.8 kg, rated operating capacity of 419.6 kg and maximum hinge pin height reach of 214.6 cm, the radial lift path of the S925TX makes easy work of lifting and dumping heavy loads.

The new mini skid steer features a dual auxiliary system, which allows the operator to switch between high flow for ground-engaging attachments and low flow for maximum control. It is also equipped with a universal mounting plate that fits a broad range of Vermeer-approved attachments.

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



ABOVE: The SPX25 vibratory plow has a full-function remote control that gives the operator a 360-degree view of the jobsite.

BELOW: The S925 mini skid steer features a dual auxiliary system, which allows the operator to switch between high flow for ground-engaging attachments and low flow for maximum control.



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

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Kobelco launches new crawler cranes

Kobelco Construction Machinery has launched new hydraulic crawler cranes, with a maximum lifting capacity of 300 t for standard crane and 350 t with an SHL (Super Heavy Lift) specification. The models include the CK3300G-2 (North America), CKE3000G (Europe) and CKS3000 (Standard).

All of them (CK3300G-2, CKE3000G and CKS3000) represent the largest models of Kobelco's multi-purpose crawler crane in the CK/CKE/CKS series. The basic concept of these new machines is versatile & all rounder, said Kobelco. The CKS3000 is powered by an EU Stage IIIA/US Tier 3 engine and has a boom length of 90 m, maximum fixed jib combination of 78 m + 30 m, maximum luffing jib combination of 60 m + 66 m, and heavy fixed jib combination of 72 m + 30.5 m. The SHL specification features a boom length of 102 m and maximum luffing jib combination of 84 m + 90 m.

Due to the recent increase in weights and dimensions of construction materials and heights of high-rise buildings, mobile cranes are required to have a higher lifting capacity as well as improved productivity and safety, explained Kobelco. Responding to such needs, the company thus developed the new 'all rounder' cranes that can perform a wide variety of tasks on different jobsites as well as handling very heavy lifts in large-scale projects.

Various types of attachments are available on the new cranes, ranging from standard crane configuration - including fixed jib, heavy fixed jib and luffing jib, which are suitable for multipurpose works - to the super heavy lift configuration, including luffing jib, for the heaviest lifts. These attachments provide ideal solutions for individual jobsite requirements. The new cranes have also been designed to be as compatible as possible with the other Kobelco crane models - for example, their jibs and pallet weights.

In addition, the new cranes provide an excellent lifting capacity. Compared to the Kobelco 250 t CKE2500G-2 - the company's best-selling model - the load moment in the standard crane specification is 40 percent higher and 60 percent higher in the standard luffing configuration. The SHL specification can compete with the 400-500 t classes (standard crane specification).

To achieve maximum ease of operation, the new cranes' specifications are optimised for the actual jobsite environment. The undercarriage has been improved so that the cranes can operate on rough ground jobsites, with high ground clearance and superior propelling performance, while minimising the overall footprint. The cranes are also fitted with Kobelco hydraulic control system. In order to correspond to specific jobsite needs, a free-fall winch (optional) is available as well.

The cabin features an operator-friendly environment with better comfort and safety, and also ease of operation. The extra-wide windows and tilt mechanism offer good visibility. An intuitive-designed Moment Limiter monitor makes it simple for users to quickly master the operation with easily understandable pictograms and a touch screen panel. As an added safety function, a working range limiter will assist the operator in preventing collisions.

According to Kobelco, the cranes conform to the local transport regulations. The transport width is less than 3 m for all components and the main machine's weights can be adjusted with some variations in order to meet transport restrictions. A self-assembly system is available for crawlers, lower boom, carbody weights and counterweights. ■

Website: www.kobelco.com



CKS3000 (Standard).

CKE3000G (Europe).

CK3300G-2
(North America).

Tsurumi GSZ-150-4 submersible pump

The latest addition to Tsurumi GSZ-series of submersible high head, high volume pumps is the GSZ-150-4 model, which is equipped with a 150 kW motor. It is positioned as the highest class model in the series, designed for continuous duty in tough applications.

The GSZ-150-4 has a maximum head of 70 m and maximum capacity of 19 cu m/min. To withstand harsh conditions, the impeller is made of highly wear-resistant, high-chromium cast iron. The pump features side discharge by way of a spiral flow route that ensures smooth passage of solid matter. The motor is encased in a water jacket, which cools the motor if kept running at low water level for extended periods of time.

The GSZ-150-4 also comes standard with an anti-wicking cable, motor protector, leakage sensor, dual inside mechanical seals with silicon carbide faces, and oil lifter. In addition, the pump is fitted with relief ports that release pumping pressure before it can act on mechanical seal.

Tsurumi GSZ-series pumps are built for excellent reliability in heavy-duty applications. They can run continuously in difficult environments, such as mining, quarries, construction and tunnel projects, among others. ■

Website: www.tsurumi-global.com



The new Tsurumi GSZ-150-4 submersible pump is equipped with a 150 kW motor, and has a maximum head of 70 m and maximum capacity of 19 cu m/min. It is positioned as the highest class model in the GSZ-series, designed for continuous duty in tough applications.



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Wirtgen add large milling machines for Asian market

The latest cold milling machines from Wirtgen - the W 195 and W 205 - complete the company's new large milling machine series for the Asian market, along with the W 215 model.

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

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

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

The other model, the W 205, is designed with high milling performance and professional supplementary equipment. The machine is equipped with a 455 kW diesel engine and caters to a wide range of applications, from surface course rehabilitation all the way to full pavement removal.

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

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

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



The W 195 is designed for economical applications.



The W 205 offers high milling power.

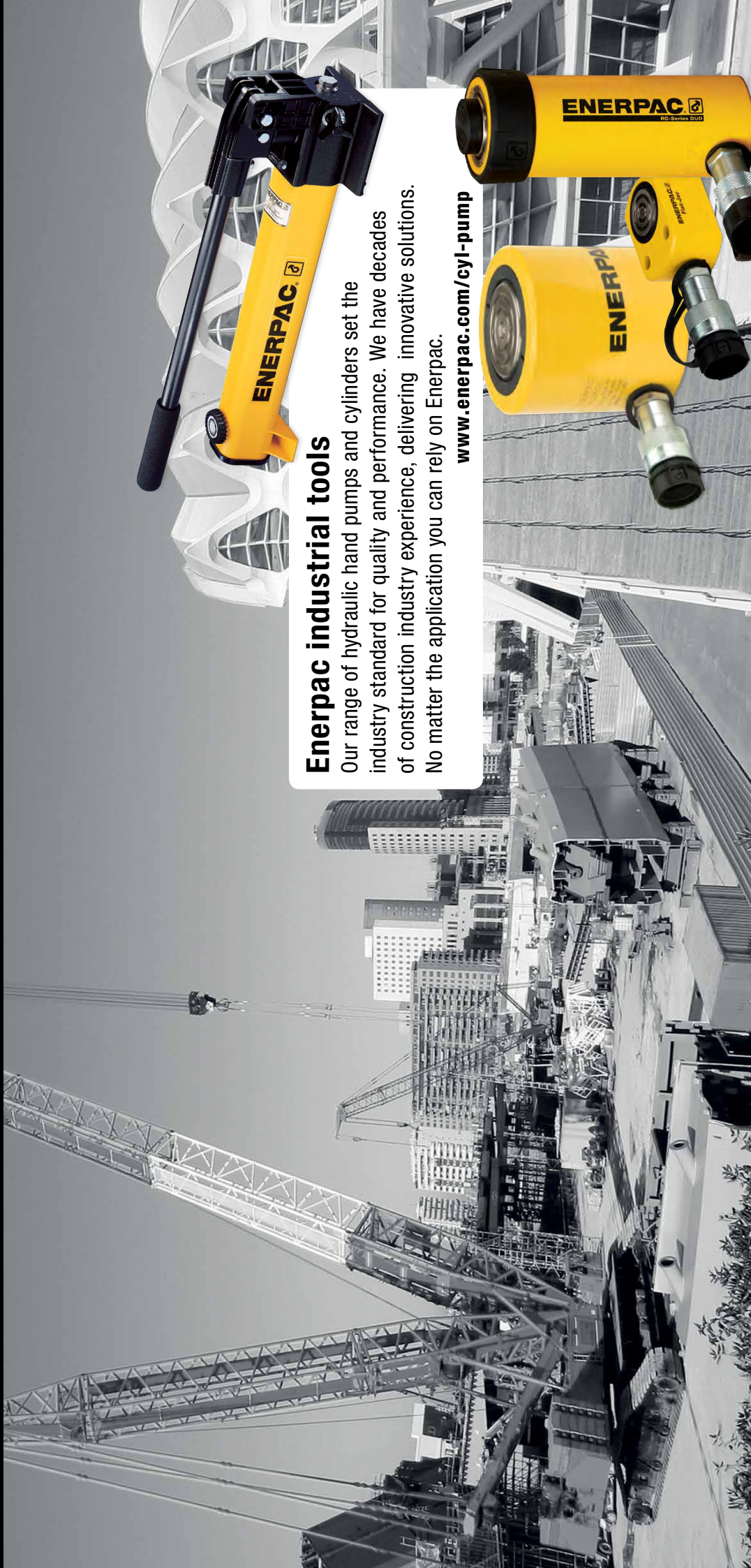


The W 215 is aimed for professional applications.

The W 215 also has a comprehensive range of equipment including the VCS vacuum cutting system for good visibility and optimum working conditions, camera system, LED lights, milling drum turning device and last but not least with a set of levelling equipment. ■

Website: www.wirtgen-group.com/singapore

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First Potain hydraulic topless luffing jib crane

The new Potain MCH 125 is the first hydraulic topless luffing jib crane from Manitowoc. Having previewed as a prototype at bauma China 2016 in Shanghai, the first units have since been tested on site with select dealers in Thailand, Australia and New Zealand ahead of the crane's launch into several international markets, said the company.

With a cutting-edge design and new technology, the crane combines the advantages of Potain's MCR luffing jib cranes and MCT topless cranes. Contractors will find it particularly straightforward to assemble and disassemble the crane on congested sites, making it an ideal choice for urban projects, city-centre work or other jobsites where space is limited.

Maximum capacity for the MCH 125 is 8 t, while the maximum jib length is 50 m. Tip capacity is 2 t and maximum line speed is 100 m/min when fitted with the 60 LVF 20 hoist. The crane's innovative design offers a number of advantages, including fast erection and dismantling. The topless design means less space is needed on site, as there is no cathead to assemble at ground level before installation.

The crane also uses Potain's VVH hydraulic luffing technology for vertical movement of the jib, which eliminates the need for luffing wire ropes. With VVH technology, the MCH 125 is able to raise from a horizontal level to 87° in less than two minutes, according to Manitowoc. The hydraulics are pre-connected at the factory, thus avoiding the need to perform this duty during the crane's on-site assembly.

The hydraulic luffing design also means the crane has a shorter counter-jib and out-of-service radius when compared with rope-luffing alternatives, freeing up valuable space on congested jobsites, added Manitowoc.

Furthermore, crane operators will enjoy the increased comfort and visibility that comes with the unit's Vision 140 cab – it is said to be one of the largest cabs on the market. The entire upperworks of the crane, including its full 50 m of jib, can travel on just four trucks. Assembly to a height of 40 m can be achieved in less than six hours, said Manitowoc.

The MCH 125 also features a smooth and quiet operation; and for better utilisation for fleet owners it can be mounted on existing 1.6 m or 2 m mast



TOP AND ABOVE: The new Potain MCH 125 is the first hydraulic topless luffing jib crane from Manitowoc, featuring a maximum capacity of 8 t and maximum jib length of 50 m. It is equipped with Potain's VVH hydraulic luffing technology for vertical movement of the jib, which eliminates the need for luffing wire ropes.

sections from the manufacturer's current range. Jib sections are from the MCR range of luffing jib cranes. There are five jib configurations available, ranging from 30 to 50 m, in 5 m increments.

The MCH 125 will be sold and supported through the extensive regional Potain

dealer networks. The first production deliveries are expected to begin in early 2018, with the crane available for sale throughout Asia, Africa, Oceania, the Middle East, Russia, the CIS countries and Latin America. ■

Website: www.manitowoc.com

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Volvo CE to enter rigid hauler market

Volvo Construction Equipment (Volvo CE) is set to enter the rigid hauler market with its own Volvo brand in the second quarter of 2018. The company has developed four new models, which will initially be launched in less regulated markets. These consist of the 41-t R45D, 55-t R60D, 65-t R70D and the flagship 95-t R100E.

Based on the existing Terex Trucks TR-series, the development of Volvo D-series rigid haulers (R45D, R60D and R70D) follows an in-depth engineering review, ensuring that the machines meet the standards expected from Volvo products in their target markets and segments. Improvements include greater visibility and safety systems, along with Volvo technical support and branding.

The E-series (R100E) is a completely new Volvo 95-t rigid hauler, expected to attract customers working in the quarry and mining segments. With its high capacity and hauling speeds, new V-shaped body, efficient hydraulics, intelligent monitoring systems and operator environment, the R100E is designed to help customers move more material in less time.

The new Volvo-branded rigid dump trucks will be manufactured at the rebranded Volvo Motherwell production facility in Scotland and sold exclusively through the Volvo dealer network. According to the company, the production of Terex Trucks rigid haulers will cease over time.

As for Terex Trucks-branded articulated haulers, they will continue to be designed, built and developed at the Motherwell facility, and distributed using the pre-existing Terex Trucks independent dealer network. ■

Website: www.volvoce.com



ALL IMAGES: Volvo Construction Equipment is set to enter the rigid hauler market with its own Volvo brand in the second quarter of 2018. The company has developed four new models - which will initially be launched in less regulated markets - including the R45D, R60D, R70D and the flagship R100E.

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New Ammann pavers and heavy rollers with oscillation

Ammann has introduced a new line of premium asphalt pavers, designed for various applications ranging from narrow paths to city streets to wide lifts for roadways and airports. The paving line is diverse and includes 17 models, with tracked and wheeled versions available. Screed options include tamping/vibrating, high-compaction and rigid-frame. There are three major size groups: compact pavers (including the mini paver), city pavers and large pavers.

Compact pavers have production capacities of 300 t/hr and maximum paving widths of 3.1 m. When space is particularly tight, Ammann offers the AFW 150-2 mini paver, with paving widths as narrow as 250 mm.

The four city paver models can place 350 t/hr with maximum widths of 4.7 m. Their mobility and size make them great tools for urban jobsites and inner city applications where smaller roads need to be placed fast – and meet high quality requirements.

Large pavers can reach 1,100 t of hourly production with maximum widths of 14 m. They are available with conventional controls or with the advanced *PaveManager 2.0* system. The machines are well suited to large jobsites where quality, speed and large paving widths are the main focus.

In addition, the Ammann ARX 90 and ARX 110 articulated heavy tandem rollers can now operate in oscillation mode or with traditional vibration, allowing the operator to choose the best method for the job. The machines are available with Tier 4 Final or Tier 3 engines.

Oscillation eliminates about 90 percent of the stress on materials when compared with a traditional circular vibratory system, explained Ammann. This is important when compacting on bridges, over sewers and utility lines and near buildings where a traditional vibratory approach can cause damage. Oscillation uses less force but delivers both vertical and horizontal energy, essentially massaging the aggregates into place. The drums maintain constant contact with the ground and deliver both static and dynamic forces.



ABOVE AND BELOW: The Ammann ARX 90 and ARX 110 articulated heavy tandem rollers can now operate in oscillation mode.



TOP AND ABOVE: Ammann's new line of premium asphalt pavers comprise three major size groups: compact pavers (including the mini paver), city pavers and large pavers.

The ARX 90 and ARX 110 with oscillation can bring substantial benefits to jobsites. In asphalt applications, they are able to work on hot mats sooner than traditional rollers, and they can also stay on cold mats longer, said Ammann. This greatly expands the compaction window, essential for time-pressed crews.

The rollers are also excellent for sealing asphalt joints. The massaging motion of oscillation provides enough energy to break down the hot asphalt – yet does not damage the adjacent cold mat. When working in soil applications, the compactors prevent damage to sensitive structures and over-compaction.

For those occasions when oscillation is not required, the ARX 90 and ARX 110 with oscillation feature heavy-duty, two-stage vibrator. Each drum has an independent vibratory pump. Amplitude and frequency are easily adjusted from inside the cab. The non-split drums offset up to 17 cm on both sides.

The cabs of the ARX 90 and ARX 110 with oscillation are spacious, comfortable and quiet. Operator-friendly features include a multifunctional display in the steering wheel, a tiltable and adjustable steering column and control switches on the armrest. Onboard diagnostics quickly alert operators to issues.

The controls make the machines easy to operate. They are responsive, with articulated steering and an articulating oscillation joint that enables work in crab mode. A differential lock is standard. A 170° rotating and sliding seat enables visibility with excellent sight lines to drum surfaces, edges and spraying bars. Service points are easy to access, and the roller's single-drum pump requires minimal maintenance. ■

Website: www.ammann-group.com

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Liebherr's new concrete pump and upgraded tower crane

Liebherr has developed the THS 110 D-K crawler concrete pump, which offers a maximum delivery rate of 102 cu m/hr and is powered by a six-cylinder engine. The series of Liebherr crawler concrete pumps encompasses a total of three models: the THS 80 D-K, THS 110 D-K and THS 140 D-K, with maximum delivery rates ranging from 65 to 135 cu m/hr.

The THS 110 D-K's powerful pump unit features smooth operation and excellent suction performance. The hydraulic system is easy to maintain thanks to the open hydraulic circuit. For optimum serviceability, the wear parts could be quickly and easily replaced.

The smooth surfaces of the pump housing are easy to clean and the shape of the concrete hopper, devoid of edges and projections, minimises the accumulation of concrete residue and soiling, said Liebherr. The concrete pump's extensive standard scope of delivery includes a 500-l water tank with water pump and a lockable toolbox, among others.

The THS 110 D-K is especially well-suited to jobsites that involve frequent relocation around the construction site. Fitted onto a crawler running gear, the concrete pump is moved and controlled via a radio remote control.

A typical application for crawler concrete pumps is providing drilling rigs with concrete for bored piling foundations, explained Liebherr. This involves drilling deep holes into the ground and filling them with concrete as the drill is removed. The concrete pump is employed in the various application positions alongside the drilling rig, with its concrete hose remaining permanently connected to the drilling rig.

Liebherr drilling rigs and Liebherr crawler concrete pumps can also communicate with each other via radio, and the pumping processes can be controlled by the driver of the drilling rig from the cab.

In addition, Liebherr has modified its 172 EC-B 8 Litronic flat-top crane – the unit's range has been increased by 2.5 m and it can now be combined with the new Liebherr tower system. The crane can now hoist 1,800 kg at the jib head with a radius of 62.5 m. Its maximum load capacity is still 8,000 kg.

The finer division of the jib in 2.5-m steps means that the crane can be adjusted even more precisely to site conditions



LEFT: The THS 110 D-K, which is fitted onto a crawler running gear, is moved and controlled via a radio remote control.

BELOW: The outreach of the new 172 EC-B 8 Litronic flat-top crane is 2.5 m longer than that of its predecessor.



and, if necessary, to the awkward edges of buildings, said Liebherr. The crane can be supplied with the new 16 EC, 16 HC, 17 HC and 21 HC tower systems. The maximum freestanding hook height of the flat-top crane remains at 71.4 m.

The Liebherr 16 EC tower system is a new addition to the Liebherr tower system product portfolio and available in 2-metre-tonne classes. The range comprises 16 EC 160 and 16 EC 240 towers, with the first figure being the external dimensions of 1.60 m by 1.60 m and the second figure specifying the metre-tonnes. The crane is also supported on a new 20 EC cruciform base with external dimensions of 4.50 m.

Liebherr's LiUP crane driver elevator is powered by a lithium-ion battery with an energy recovery system and is compatible with both the EC and the HC tower system. The elevator can be installed on the inside of the tower. The rails for the Liebherr crane driver elevator are coordinated to the length of the Liebherr tower sections, only require one-time installation and, if they are installed on the inside of the tower, do not have to be removed for dismantling and assembling the tower crane. According to Liebherr, new tower systems can be ordered from the factory with or without rails. ■

Website: www.liebherr.com

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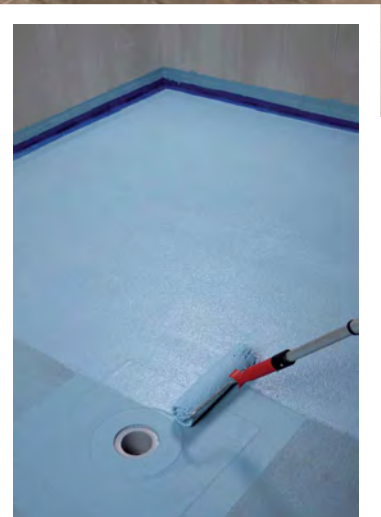


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XCMG XR130E drilling rig

The XCMG XR130E rotary drilling rig is designed for easy transport, equipped with a 2.5-m-wide by 3.5-m-high drilling rod. The rig can be used in a wide range of applications, featuring a compact dimension and excellent stability. The power head has also been improved to enable a more accurate drilling performance, said XCMG. According to the company, the XR130E is a popular model in the Australian market. To meet the local standard, a remote control has been added to the machine. ■

Website: xcmg.com



XCMG XR130E rotary drilling rig is designed for easy transport, featuring a compact dimension and excellent stability.

Skyjack BIM-compatible models now available

Skyjack BIM-compatible image and data files are now available to assist architects and engineers with their digital project plans. The BIM (Building Information Modelling) technology digitally constructs an accurate virtual model of a project. This model can be used for planning, design, construction and operation of the facility. It also helps architects, engineers and construction companies visualise their project in a simulated environment which, in turn, enables them to identify potential design, construction or operational issues.

Skyjack products currently available as models include: SJ12 and SJ16 vertical mast lifts; SJ3219, SJ3226 and SJ4632 DC scissor lifts; SJ6832 RT, SJ8831 RT, SJ8841 RT, SJ9241 RT and SJ9250 RT rough terrain scissor lifts; SJ46 AJ, SJ51 AJ, SJ63 AJ and SJ85 AJ articulating booms; and SJ30 ARJE DC articulating boom.

According to Skyjack, the BIM library will be expanded to include its telescopic booms in 2018. ■

Website: www.skyjack.com



Skyjack BIM-compatible image and data files are now available to assist architects and engineers with their digital project plans.



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Sumitomo asphalt pavers ideal for Asian market

Among Sumitomo asphalt pavers targeted at the Asian market are the HA60C-8 and HA90C-2, which are available in both crawler and tracked versions and are equipped with the 2360 and 2875 J-paver screeds. The J-paver screed is designed by Sumitomo and can be freely extended from 2.3 to 6 m (2360) and 2.8 to 7.5 m (2875) without any bolt-on extensions. Another popular paver is the HA60W-8, featuring both wheel and tyre types.

One of the highlights of the HA60W-8 and HA60C-8 models is the low height of their hopper, allowing the operators to feed in asphalt material from a greater range of truck sizes. Sumitomo said the turning circle of the HA60W-8 has also proven to be advantageous for the machine's 4WD parallel drive system. Plus, the HA60W-8 offers excellent manoeuvrability and is controllable when laying with high density.

The HA60W-8 has been involved in various infrastructure projects around Indonesia. The paver is fitted with an infinitely variable triple screed, and its monitor display can be translated into local language, making it easier for local operators to carry out their job.

Sumitomo HA90C paver (with the 2875 screed) is also suitable for the Indonesian market, having performed works on several airport projects in the country. The model is gaining acceptance in China as well. In August 2015, the first HA90C-2 with the 2875 screed was manufactured at Sumitomo's local plant in Hebei Province, and delivered to its customer in Guangzhou City, Guangdong Province. The same customer owns a total of four Sumitomo asphalt pavers, including one HA60W-7, one HA60C-7, and two HA90Cs.

Headquartered in Japan, Sumitomo introduced its pavers to the Southeast Asian market in 2010 and the company is currently active in Indonesia and Thailand. According to Sumitomo, the company will increase its performance in Southeast Asia and expand its presence throughout the region and across Asia. ■

Website: www.sumitomokenki.com



ALL IMAGES: Sumitomo asphalt pavers targeted at the Asian market include the HA60C, HA60W and HA90C models. They are equipped with the Sumitomo-designed 2360 and 2875 J-paver screeds, which can be freely extended from 2.3 to 6 m (2360) and 2.8 to 7.5 m (2875) without any bolt-on extensions. The machines have been used in widely in countries like Indonesia, Thailand and China, performing various road and airport projects.

Simex TF cutter heads

Singapore-based company IPE-Eagle Pte Ltd offers Simex TF cutter heads for trenching, profiling and resurfacing rock and concrete walls, quarrying, demolitions, dredging and finishing operations. These attachments are designed with low vibrations and reduced noise levels, so they can be used near residential areas, schools or hospitals.

The TF cutter heads have high torque and efficiency, provided by the integrated high displacement hydraulic piston motor fitted in a coaxial position with respect to the drums. As a result, the drums are not moved by a mechanical drive system and can benefit from the hydraulic drive. The coaxial layout of the motor also allows the shaft - which features double bearings - to support both drums, transmitting only the motion to the drums and prevent it from bearing any load.

The TF heavy line includes an oil flow limit valve that reduces risks and damage related to over revving of the hydraulic motor to ensure a long life. Furthermore, Simex cutter heads are fitted with mechanical seals on the drums, making them dust tight when fully submerged into the ground; they can also prevent foreign objects from penetrating even when being put to work in mud. Added to these benefits is the special shape of the frame, which allows hoses to be connected at both sides and at the front.

According to IPE-Eagle, TF cutter heads can work under water to a depth of 50 m with no additional sealing or protection, and they can be specially ordered to perform flawlessly in salt water. The cutter heads have been used around the world in various applications, enduring sub-freezing temperatures in the Arctic to scorching conditions in the desert. ■

Website: www.ipe-simex.com



Simex TF cutter head is seen here mounted on an excavator. The attachment is designed with low vibrations and reduced noise levels, making it an excellent choice for use near residential areas, schools or hospitals.

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Liebherr towering above Bangkok and Pune

Main contractor Thai Obayashi Corp is working on the Samyan Mitrtown project in Bangkok's central business district, Thailand, with the help of three Liebherr luffing jib tower cranes. Two of them, a 160 HC-L and a 125 HC-L, arrived on site in early 2017 while the third, another 160 HC-L, was scheduled to arrive on site in December 2017.

Samyan Mitrtown is being developed by Kasemsubbhakdi Co, a 49:51 joint venture between Golden Land and TCC Assets (Thailand) Co. When completed, it will feature a 33-floor residential and hotel tower, a 32-floor Grade A office tower and a six-storey retail area.

Thai Obayashi said the two Liebherr cranes already onsite are both climbing units. The 125 HC-L, which is part of the company's fleet, was selected because it has a small tower section of 1.6 x 1.6 m, enabling it to fit into a lift shaft. This model can lift a maximum of 6 t, and 1.9 t at the end of its 50 m jib. The 160 HC-L is also a climbing unit, but on that working area of the jobsite the need is for heavier loads, notably lifting precast items that require 2 t at the end of its 55 m jib. Liebherr's distributor for Thailand, STIT Company Ltd, is supplying this unit to Thai Obayashi under a rental agreement.

The third Liebherr crane will also be a 160 HC-L, supplied by STIT on rental, but is a stationary version. All of the cranes are planned to be on site until the beginning of 2019, with Samyan Mitrtown due to be completed and opened by the third quarter of that year.

In addition, SJ Contracts Pvt Ltd is deploying two Liebherr NC-B 6-62 flat-top tower cranes on the Balewadi Techpark development in Pune, India. This new commercial building is part of the 2.2 mil sq ft of the Panchshil Business Park, and upon completion it will cover two basements, a ground floor and 16 stores.

The two Liebherr NC-B cranes are used as internal climbers because of the huge height of the building: 83.3 m. They lift building materials at 35 m working radius and up to 3.40 t. At 35 m working radius, the cranes can still lift 3.92 t, said Liebherr, and with the 50 m jibs, they can easily cover the whole construction site. The assembly of the cranes was carried out in June 2017 and in the end of 2018, the building is expected to be finalised.

Both cranes are used for the climbing formwork of the building and therefore have tower heights of 46.80 m, with an overhang required of around 18 m at any moment of construction progress. According to Liebherr, the NC-B 6-62 was in fact achieving 21.7 m. Consequently, they need less climbing steps and this in turn accelerates the whole building process.

The new 16 EC tower system with external dimensions of 1.60 m x 1.60 m was developed for the new NC-B cranes. These tower sections are climbable and connected by using pins. The hydraulic unit is suitable for both internal and external climbing. It can be removed in full and is compatible with other Liebherr tower cranes of the same crane class, meaning that operators only require one unit that can then be used at different sites. ■

Website: www.liebherr.com



Thai Obayashi Corp uses Liebherr HC-L luffing jib tower cranes (left) to build Samyan Mitrtown project in Bangkok, Thailand, while SJ Contracts deploys Liebherr NC-B 6-62 flat-top tower cranes (right) on the Balewadi Techpark development in Pune, India.

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Volvo leads the way in Indonesia and Korea

In 2010, one of Indonesia's most dangerous volcanos - Mount Merapi in central Java - violently erupted over the course of two months, engulfing nearby areas in ash, mud and debris. Described as one of the largest volcanic eruptions in the region since the 1870s, the volcano dumped mass amounts of cold lava that flooded and damaged rivers including the nearby Pabelan River in Muntilan, Magelang.

Now close to a decade later, a local mining quarry company is using a crawler excavator from Volvo Construction Equipment (Volvo CE) to mine for rocks and to help stabilise the Pabelan River. CV Sumber Jaya Sakti purchased the EC210D excavator from PT Indotruck Utama, a Jakarta-based Volvo CE dealer. On site since September 2017, this versatile machine is helping to move between 280 and 300 cu m of sand and rocks per day. It is expected to remain on site for one year working an average of 22-hours per day, as part of the two-year river stabilisation project.

The EC210D features a maximum slew speed of 12.3 r/min, maximum slew torque of 76.7 kNm, maximum bucket capacity of 1.22 cu m and maximum operating weight of 22,800 kg. Powered by a Volvo D5E engine, the four cylinder, vertical, electronic-controlled high pressure fuel injectors help the excavator provides superior performance.

In addition, an army of Volvo machines has been deployed by South Korean aggregates company Keunwoo to excavate granite from the Inwha-Li quarry on Ganghwa-Gun, an island just off the northwest of the country. The quarry sits on a site restricted for military use as it lies just a few kilometres from the North Korean shoreline. The granite was needed to meet growing demand for construction materials from the nearby cities of Incheon and Gimpo.

Inwha-Li Quarry excavates and crushes over 1,200,000 cu m of granite each year. To keep up with that level of production, Keunwoo needs reliable equipment – including its excavators, haulers and wheel loaders from Volvo CE – to keep its site productive and profitable. With operations restricted to a maximum of 10 hours per day, downtime is not an option.

Among the new machines Keunwoo invested in were three Volvo L250H wheel loaders. The company said this model was able to fill a 25 t truck in just three loads,



ABOVE AND LEFT: CV Sumber Jaya Sakti employs Volvo EC210D excavator to mine for rocks and help stabilise the Pabelan River, which was damaged by the eruptions of Indonesia's Mount Merapi in 2010.

BELOW: Volvo L250H wheel loader works for aggregates company Keunwoo at the Inwha-Li quarry in South Korea.



compared to the four loads it took the old models. As a result, this increased loading capacity boosted Keunwoo's productivity and lowered its cost per ton.

The L250H features Z-bar linkage to provide high breakout force for powerful digging in hard materials. The high lift capacity enables fully loaded buckets to be elevated to maximum height while the superior hydraulic speeds help deliver faster cycle times.

Since 2015, Keunwoo has expanded its

fleet to include three Volvo A40G articulated haulers, two EC480EL crawler excavators and an EC300EL crawler excavator. Powered by the latest Tier 4 Final Volvo 16 l engine, the A40G can carry 39 to while providing up to 10 percent more efficiency. The EC480EL's and EC300EL also meet Tier 4 Final engine emission legislation and feature high torque at low rpm, reduced fuel consumption and increased productivity with faster cycle times. ■

Website: www.volvoce.com

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Potain delivers major projects in Malaysia and China

CB Construction is relying on Potain cranes for the mega projects it manages, such as the construction of one of the largest shopping malls in Malaysia for retail group AEON. Here, CB Construction used an MC 310 K12 tower crane to help with superstructure work on the project, which will cover some 110,000 sq m and comprise five stories. The new development, located in Nilai, around 50 km south of Kuala Lumpur, is set to open in 2018.

The MC 310 K12 has a maximum capacity of 12 t and can lift up to 3.2 t at its 70 m jib end. On the AEON project loads for the crane include 2 t formwork sections. The MC 310 K12 is scheduled to stay at the jobsite for 10 months. It was supplied to CB Construction by IFT, a Potain dealer in Malaysia.

In another project, six Potain cranes are working to construct a record-breaking bridge: the Yangsigang Bridge in Wuhan, Hubei Province, China. The gigantic project involves the construction of a 4,134 m double-deck suspension bridge with a main span that stretches 1,700 m across the Yangtze River, the longest river in Asia.

The equipment rental division of China Railway Major Bridge Engineering Group supplied two Potain MC 475, two MC 310 K16 and two MCT 205 tower cranes to the project to build the anchor foundations and bridge towers. The two bridge towers will stand at 250 m once completed.

Two Potain MC 310 K16 and two MC 475 cranes are handling construction of the bridge towers. Standing at 51.8 m, the MC 310 K16 offers a 16 t capacity and a maximum of 70 m of reach while the Potain MC 475 provides a 25 t maximum capacity and up to 80 m of reach.

Also speeding up construction are the 100 LVF 63 Optima winches of the MC 475 that spool 726 m of wire rope and can lift 25 t loads at up to 15 m/min when rigged in a four-fall configuration. The two MCT 205 units are constructing the anchor foundations.

The four Potain cranes building the bridge towers are lifting a variety of materials. The two MC 475 models offer a particularly impressive working configuration, and will require only six anchorages to reach their final working height for the 250 m main bridge towers. This not only improves operational efficiency during the construction process, but also delivers cost savings.



Potain tower crane helps CB Construction with superstructure work on a new shopping mall in Nilai, Malaysia, which will cover some 110,000 sq m and comprise five stories.



Several Potain cranes also work on the record-breaking Yangsigang Bridge in Wuhan, Hubei Province, China.

To ensure the maximum amount of crane uptime, Manitowoc Crane Care staff have been paying regular visits to the jobsite, handling routine maintenance work and also training staff. Construction of the project is expected to complete in the first half of 2019.

As the city's first double-deck bridge, the new Yangsigang Bridge will serve as an express route between Hangyang and Wuchang districts, two of the three major

towns in Wuhan. The bridge will carry 10 lanes of traffic, with the upper deck being an expressway and the lower deck an arterial road. Upon completion, the project is set to be the longest suspended span bridge in China, and the second longest in the world. It will be the first double-deck bridge across the Yangtze River and is expected to cost RMB 8.5 billion. ■

Website: www.manitowoc.com



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Haulotte meets challenges in Saudi Arabia

Roots Group Arabia & United Gulf Equipment Rentals have supplied a full range of Haulotte aerial platforms for the construction of the King Abdul-Aziz International Airport project in Jeddah, Saudi Arabia.

The project is developed by KSA's General Authority of Civil Aviation to increase the airport's yearly capacity from 13 to 80 million passengers. It will be carried out in three phases, with the first phase scheduled for completion in mid-2017.

Haulotte boom lifts were used for building and finishing the modern high tech elevations. The telescopic HT43RTJPro, which features rough terrain capabilities and the diesel articulated HA41RTJPro with its 360 continuous turntable rotation ability helped to reach the difficult working areas in top of the elevations. The HA260PX was used to build the bridges of the railway station that will ensure the connection with the two holy cities, Mekka and Madina, meeting the demand from religious tourism.

A number of Haulotte diesel and electric scissors has also been used for indoor works. The H18SX and H15SX are perfectly up to these tasks with their ergonomic and spacious designed platform, thanks to their double extension. The 4WD with hydraulic differential lock greatly improves the traction on all grounds. The heavy duty Haulotte Compact 8 was deployed for electrical installations, false ceiling, fire sprinkle installation and interior design of the airport.

In addition, Saudi Aramco's new Jazan Refinery and Terminal in Saudi Arabia is another project where Haulotte was involved. The refinery will be a grassroots facility with an anticipated capacity of up to 400,000 barrels per day (BPD). It is expected to produce 80,000 bpd of gasoline, 250,000 bpd of ultra-low sulfur diesel and over 1 mil t/year of benzene and paraxylene products. The Jazan Refinery complex will also be equipped with a modern port and a 4 GW power plant that will make the refinery entirely self-sufficient and provide power to locally owned manufacturing and service companies.

The Haulotte machines that are mainly used on the project are the HA41PX-NT and HA41RTJ Pro articulated boom lifts, and the HT43RTJ PRO telescopic boom lift. The HA41 models have an outreach of 19.80 m and a lifting speed of less than 40 seconds, reducing time and increasing productivity.



ABOVE, ABOVE LEFT AND LEFT: **Roots Group Arabia & United Gulf Equipment Rentals** have supplied a full range of Haulotte aerial platforms for Saudi Arabia's new King Abdul-Aziz International Airport project in Jeddah.

The recently launched HT28RTJ Pro, equipped with the STOP emission system, is also working on the site. The system automatically puts the machine in standby after an extended period of inactivity.

As per Saudi Aramco's request, all the machines were equipped with a secondary guarding system, the Haulotte Activ' Shield Bar 2.0, which offers additional protection. It shields users from any risk of crushing without compromising productivity.

The Activ' Shield Bar 2.0 system alerts the operator to potential entrapment situations and it also features a Safety Gap, which can protect the operator from full entrapment and potentially allow them to get out of danger. Following the alert, only reverse/lowering movements are permitted, allowing the possibly panicked operator to get out of trouble without making the situation worse. And, after being triggered, the system is easy to reset and reactivate from the basket, meaning there is no machine downtime. ■

Website: www.haulotte.ae



Haulotte aerial platforms have also been involved in Saudi Aramco's new Jazan Refinery and Terminal in Saudi Arabia.

XCMG overcomes harsh conditions in Qatar

Qatar is currently preparing for the 2022 World Cup, with many infrastructure projects being developed in the country. Among them is the construction of dual four-lane Dukhan Expressway, which upon completion will be one of the most important thoroughfares to the World Cup stadium.

Work on the Doha section of the project, which is in the vicinity of the main stadium, has recently started and is in full swing. Here, a number of XCMG cranes are being used to perform lifting duties. According to the project contractor, there are as many as 25 XCMG cranes working day and night on the jobsite along the Doha section.

XCMG said the extremely harsh working conditions in Qatar - a tropical desert climate with temperatures rising as high as 45°C - pose a serious challenge to the operating performance of the cranes. The company also mentioned that in the upcoming construction phase, which will involve construction of several major bridges, more XCMG cranes are expected to be employed. ■

Website: www.xcmg.com



TOP, ABOVE AND BELOW: A fleet of XCMG cranes carries out lifting works on a Doha section of the Dukhan Expressway project in Qatar.



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Black & Veatch was involved in the construction of a coal-fired supercritical power plant in Banten, Indonesia, which was completed last year.



POWERING SOUTHEAST ASIA

BLACK & VEATCH HAS BEEN PLAYING A CRUCIAL ROLE IN THE CONSTRUCTION OF POWER PLANTS ACROSS SOUTHEAST ASIA. THE COMPANY'S EPC PROJECT MANAGER, YU YI, TALKS TO SOUTHEAST ASIA CONSTRUCTION ABOUT THE CHALLENGES AND THE PROGRESS OF THE INDUSTRY, AND ALSO SHARES SOME OF THE KEY PROJECTS IN THE REGION.

While some developing Southeast Asian countries are struggling to provide full electrification to meet the demands of their energy-hungry middle-class population, those that have achieved full electrification are focusing on the needs of industries by improving power reliability and integrating renewables into the grid.

According to Black & Veatch, studies project that the middle-class population in Southeast Asia will more than double from 135 million to 334 million by 2030. The region needs over US\$500 billion in power and US\$250 billion in water investment to support that projection.

Indonesia media has reported that the nation's electrification ratio was 92.8 percent in the first half of 2017. At the same time it reported that some 13 million people, mainly on outlying islands, are without access to power and 17,000 schools have no electricity. Island electrification is a clear priority as the country targets near-universal electricity access by 2020.

The Philippines is aiming for 100 percent household electrification by 2022, adds Black & Veatch. The number of

households with access to electricity was 90.65 percent as of December 2016. Luzon is 95.5 percent energised while in Visayas, 94 percent of households are energised. In Mindanao, the electrification rate is 74 percent, while the smaller, more remote islands have rates that fall below those reported of the main islands. The government is focusing on developing indigenous sources of fuel to improve energy resilience.

Having achieved 100 percent electrification, Thailand is looking into improving its transmission lines to increase the reliability of the service, says Black & Veatch. With industry consuming almost 50 percent of national power generation, improving reliability of supply is critical to boosting the country's competitiveness in the region.

Being an EPC (engineering, procurement and construction) manager, Mr Yu leads all aspects of power projects including engineering, procurement, project controls, health and safety, and field construction management. He is currently based in Beijing, China, but develops and executes EPC processes for power projects globally. As the industry grows and offers more opportunities, Mr Yu is excited to contribute to the region's progress.

Embracing global sourcing

As Southeast Asia is a melting pot for multinational, intra-regional and local participation, working on projects across the region presents Mr Yu with valuable opportunities to practice cross-cultural communication in both EPC projects and owner’s engineer projects. This is especially useful, he says, as most large power plants are being developed by multinational teams.

Mr Yu highlights one owner’s engineer project, where he had the chance to collaborate with both an international client and a Chinese EPC contractor. “It gave me the chance to address the gap between what the international client needed and what the Chinese EPC contractor could provide; while at the same time building on my personal and professional experience.”

One of the opportunities in working with Chinese equipment suppliers, adds Mr Yu, is the implementation of engineering and quality control systems and helping them comply with international standards as well as Black & Veatch’s own quality requirements.

“For example, for one EPC project in Southeast Asia, Black & Veatch worked closely with Chinese equipment suppliers to ensure that all products were delivered on time and within budget while adhering to international standards. It was the result of our deep involvement in reviewing their design and spending time at the manufacturing facilities to



Yu Yi develops and executes EPC processes for power projects globally. He leads all aspects of the projects including engineering, procurement, project controls, health and safety, and field construction management.

personally inspect the equipment being manufactured.

“One way that Black & Veatch supported the project quality goals was to provide a quality control inspector who resided in the factory for several months. The company

also provided quality control support for suppliers as they sourced through their own supply chain, as this was seen as a way to indirectly help suppliers ensure quality was met at every stage.”

Bridging cultural barriers

Global sourcing is not without its own challenges, points out Mr Yu. One major focus area in internationally led EPC projects are the differences between the various global and local engineering codes and standards. “For example, China’s national standards, in certain technical aspects, are stricter than international ones,” he explains. “It was critical for the project team to understand the implications of the different standards in order to adapt them successfully.”

To reconcile these differences, many projects in the region assemble teams of multilingual and multicultural engineers qualified and knowledgeable in multiple codes and standards to ensure compliance is maintained.

As part of the project execution planning, Mr Yu identifies cultural and communication issues as opportunities to add additional value when working with professionals across the region and recommends relying on constructability best practices to bridge cultural barriers.

Constructability reviews are seen as major risk identification and reduction

Continued overleaf...

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The Banten power plant project achieved on-schedule financial close in 2013. It is the first example of an Indonesian IPP development with global financing that did not require an Indonesian government guarantee.

exercises that allow projects to return a more predictable construction timeline. They can be applied during the financing, design, erection and commissioning of the project in order to reduce errors, delays and cost overruns.

In the absence of a structured constructability programme, many complex projects revert to traditional approaches to project delivery that typically include planning, engineering design, construction, procurement and commissioning in weakly interconnected silos.

Black & Veatch shares an example of constructability success: the Glow Phase 5 project near Rayong, Thailand. Completed in 2011, the 382 MW combined cycle cogeneration plant was built for Glow Energy Public Company Limited on a plot of land approximately 100 m by 100 m, in the middle of an existing – and operating – plant with no on-site laydown area. This created many complications for the design and construction teams.

The project planned for regular constructability reviews that started in the proposal phase and continued after project award. As the design progressed, this allowed the design and construction teams to work closely together and ensure that the design was completed



“ AS TODAY’S PROJECTS ARE BECOMING MORE COMPLEX AND ARE BEING EXECUTED IN AN INCREASINGLY COMPETITIVE GLOBAL ECONOMY FEATURING TIGHTER SCHEDULES AND WITH, AT TIMES, LESS-EXPERIENCED EPC CONTRACTORS AND SUPPLIERS, CONSTRUCTABILITY PROGRAMMES ARE HELPING OWNERS, DEVELOPERS AND FINANCIERS MAXIMISE PREDICTABILITY, STABILITY AND SUCCESS ON PROJECTS. ”

with construction in mind. Because of the constructability planning, the Glow Phase 5 team was alerted to schedule conflicts prior to construction work starting. One of these conflicts was between the erection of the electrical building and the heat recovery steam generators (HRSG). Constructability reviews revealed that the optimal location for the crane required to lift the HRSG modules was the initial location of the electrical building.

However, due to startup commissioning needs, the electrical building construction would need to commence long before the HRSG crane work could be completed. The design was therefore changed to support construction needs. The solution was to relocate the electrical building to between the gas and steam turbine, build a more compact multi-storey electrical building, and relocate other equipment previously planned for the HRSG crane area.

“As today’s projects are becoming more complex and are being executed in an increasingly competitive global economy featuring tighter schedules and with, at times, less-experienced EPC contractors and suppliers, constructability programmes are helping owners, developers and financiers maximise predictability, stability and success on projects,” says Mr Yu.



Constructability planning alerted the Glow Phase 5 project team to schedule conflicts prior to construction work starting.

Emergence of microgrids

According to Black & Veatch, a trend to increase the usage of renewable energy sources in microgrids is also emerging as Southeast Asian countries explore alternatives to improve energy resilience and address the needs for rural or remote island electrification.

Microgrids have demonstrated that they can improve the resilience of utilities during natural disasters. In the aftermath of Hurricane Sandy, New York state was the first to launch a clean-energy programme aimed at spurring distribution of low-carbon community microgrids statewide. This initiative has gained rapid momentum across the US, with a total of 124 microgrids with combined capacity of 1,169 MW up and running as of July 2015.

These 'islanded' microgrids - which can be disconnected and separated from the main grid - can keep the power going on a smaller and more localised level; a critical feature for many public service facilities such as schools, universities and hospitals. This feature also makes it suitable for electrifying rural communities, or, indeed, island communities across archipelagic Southeast Asia.

"Microgrids or captive power solutions are also well suitable for medium to large industrial or commercial users seeking greater energy certainty," explains Mr Yu. "Capacity and reliability of supply remain challenging in many parts of Southeast Asia and downtime through brownouts can result in considerable financial impact for these users.

"This makes deployment of microgrids or hybrid power solutions a real consideration for mining companies,

industrial, commercial and data centre providers."

Resource efficiencies

Optimising limited or renewable resources is increasingly becoming the requirement for Southeast Asian countries, adds Mr Yu. One example is Singapore's Integrated Waste Management Facility (IWMF), which is being developed by the National Environment Agency (NEA) to meet the island's solid waste management needs. It will be equipped with cutting-edge solid-waste treatment technologies to recover resources from waste and recyclables collected under the national recycling programme.

Source-segregated food waste will be co-digested with dewatered sludge from national water agency PUB's Tuas Water Reclamation Plant (TWRP) to improve biogas production. Waste that cannot be recovered for recycling will be incinerated in a waste-to-energy facility for electricity production. The IWMF will be co-located with the TWRP to reap the benefits of a water-energy-waste nexus.

"Another opportunity to optimise resources while diversifying power source mix is integrating liquefied natural gas (LNG) and gas generation facilities," reveals Mr Yu. "For growing maritime nations like Indonesia and the Philippines, planning for integrated LNG receiving terminals and gas-fired generation is a timely solution to balance the power generation mix and help meet 2015 Conference of Parties (COP21) commitments."

Continued overleaf...


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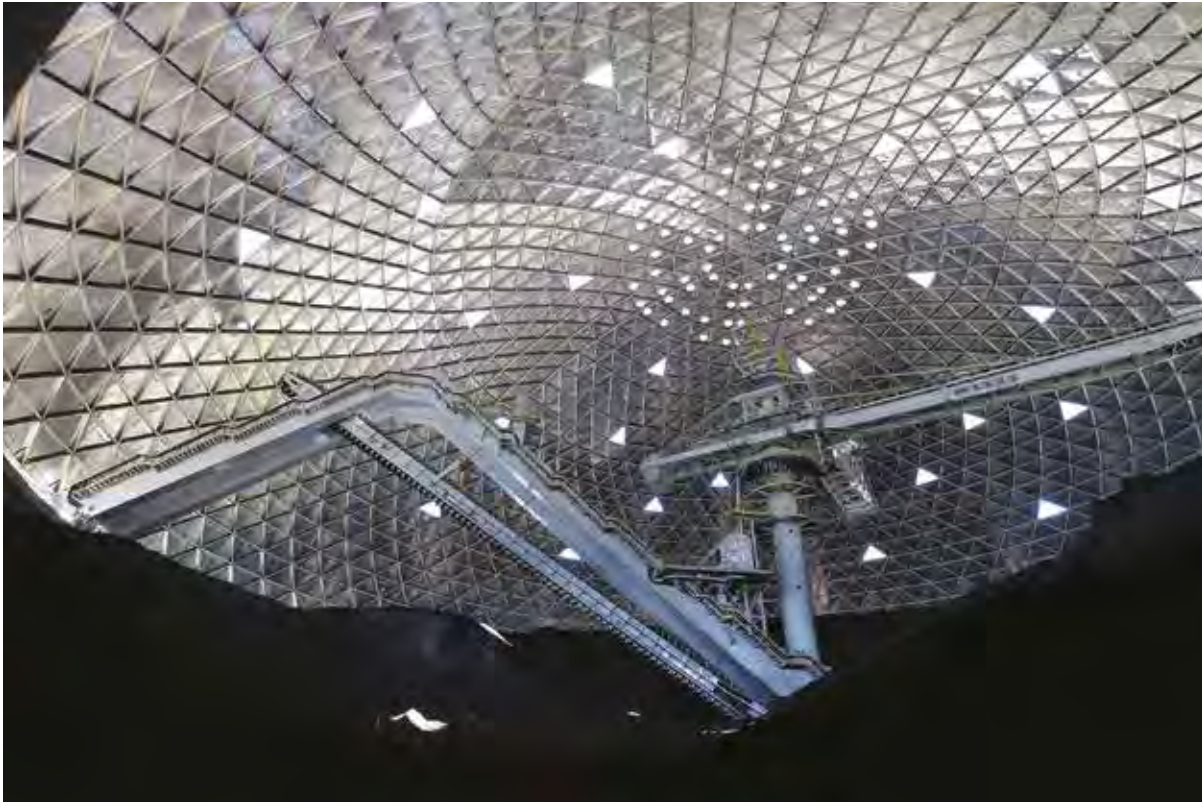
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Another challenge facing Southeast Asia countries is building facilities in high-risk seismic zones with complex soil conditions. The Therma South project in the Philippines is one example.

Synergies can be found in how the two complex facilities use and share heat, water and cold energy. Using the power plant as a sink for the LNG greatly reduces, or even eliminates, the use of seawater for vapourisation or fired vapourisation. This reduces capital and operating cost savings and dramatically reduces environmental impact. The integration is usually accomplished using a closed glycol/water, or equivalent, heating loop to capture the cold energy from the LNG and use it in the power cycle. Heat from the power cycle is then returned to the LNG vaporisers.

“Such advanced and integrated planning, if done early and adequately, will create more bankable projects,” asserts Mr Yu.

Problems: project financing, complex soil conditions

Speaking about challenges, Mr Yu mentions that project financing is a key barrier to universal electrification in Southeast Asia. “Often the quality of preparation work is the difference between a bankable or non-bankable project. To mitigate business risks, successful regional utilities and developers are implementing pre-construction best practices during the project financing stage.

“An owner’s or developer’s most important decision in the entire process may rest with the selection of the EPC contractor. Experienced owner’s and lenders’ engineers can guide developers through the financing and bidding process.”

In one example, as the owner’s engineer to PT Lestari Banten Energi (LBE), Black & Veatch helped garner investor confidence and overcome a major perceived underperformance of Chinese contractors and equipment suppliers. LBE was planning to build a 670 MW coal-fired supercritical power plant in Banten, West Java, Indonesia. The project was being delivered through Harbin Electric International Company Limited, a Chinese EPC contractor.

Black & Veatch’s effort resulted in on-schedule financial close in 2013. The project is the first example of an Indonesian independent power producer (IPP) development with global financing that did not require an Indonesian government guarantee. It was awarded

the prestigious 2013 Asia Pacific Power Deal of the Year by Project Finance International.

“Before financing was secured, the project addressed construction issues surrounding the perceived underperformance of Chinese contractors and equipment suppliers,” states Mr Yu. “Black & Veatch communicated with banks and other relevant parties to explain the technical and other parameters of the project, and the management controls and processes to be used.”

Another challenge facing Southeast Asia countries is building facilities in high-risk seismic zones and complex soil conditions. “In the Therma South project in the Philippines, the difficult soil condition pulled together Black & Veatch geotechnical experts, civil engineers and construction professionals from different offices to find the solution.”

Mr Yu believes pre-construction planning was critical to construction remaining on schedule. A constructability programme was devised in the proposal stage to enhance the plant’s design, tighten the delivery schedule and ensure everything was done with the construction process in mind.

“The artesian groundwater conditions made it very difficult to collect reliable soil information during subsurface investigation and geophysical testing and until the construction work actually began, the true extent of the groundwater was not fully understood,” he elaborates. “Every time the team bored into the ground to install a foundation or pile, they received new information and used this to continually evolve their design. It was a dynamic scenario that required constant diligence and re-evaluation.

“Unexpected limestone layers were discovered at the site at various locations and depths, so the team had to rethink piling plans. The discovery threatened to increase the amount of time required to drive the piles and increased the risk of pile damage. To avoid the risk of delay and increasing costs, the team decided that the piles in the limestone layers would be pre-drilled through the limestone shelf to reach solid bedrock.”



The Glow Phase 5 project is located near Rayong, Thailand. This 382 MW combined cycle cogeneration plant was built for Glow Energy Public Company Limited.

The civil, structural and geotechnical engineering team also had to design the power plant for the highest possible earthquake loads. The combination of silty soil in an earthquake zone created a further challenge - liquefaction, reveals Mr Yu. "Modelling earthquake events in the prevailing site conditions showed that the soil could develop properties of a liquid and become unstable and unable to support the load of the structures. Such understanding only heightened the importance of piling activity, as structures not supported by piles would be subject to massive settlements in such seismic incidents."

Additional preventative measures were taken to counteract the liquefaction potential. "This included the installation of stone columns as well as vibro compaction to increase soil densification, and taking into account the soil densification achieved through pile driving. Studies were also performed to understand the expected movements of flexible offshore water pipes, and design tolerances were adjusted to allow movement without damage."

"When earthquakes did strike the area during and after construction, the design coped, thereby preventing damage or structural failures."

This result clearly signifies the important role that engineers play in particularly difficult, complex projects, concludes Mr Yu. "It is these opportunities, intensified by the speed of economic and population growth, that makes this region such an exciting career adventure for engineers!" ■

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ITUANGO HYDROELECTRIC POWER PLANT

The Ituango hydroelectric power plant is set to become Colombia's biggest power plant. It is also said to be the largest infrastructure project underway in the country, which will include a 70 km long reservoir. Once the plant starts operating at the end of 2018, it is expected to generate up to 2,400 MW of clean energy - nearly twice that of the San Carlos power plant, currently the country's largest with a generating capacity of 1,240 MW.

The CCC Ituango Consortium, made up of the Colombian construction companies Concreto and Coninsa Ramón H, as well as the Brazilian construction company Camargo Corrêa, are in charge of the main civil works on this project for EPM (Empresas Públicas de Medellín, Colombia's main utilities company).



When completed, the Ituango hydroelectric power plant is set to become Colombia's largest power plant. A massive section of the mountain had to be excavated to enable the construction of this facility.



Lifting solution

Three Linden Comansa tower cranes are installed on one side of the dam that is being built, which will reach a height of 225 m. The three cranes were sold to the CCC Ituango Consortium and were initially assembled at the construction site by Gigacon, Linden Comansa's official distributor in Colombia. Gigacon provides its services throughout Colombia from its offices in Bogotá, Medellín and Cartagena.

Two of the cranes, the 21LC450 and 16LC185, are being used to build a controlled spillway with a design flow of 22,600 cu m/sec. Both cranes have been set up to reach a height of 60 m and assembled on a folding cross base with travelling system, so they can be moved on tracks installed on the ground. As such, the cranes are able to cover a greater area of the construction site much more quickly than if they had to be dismantled and assembled each time they are moved, resulting in time and cost savings.

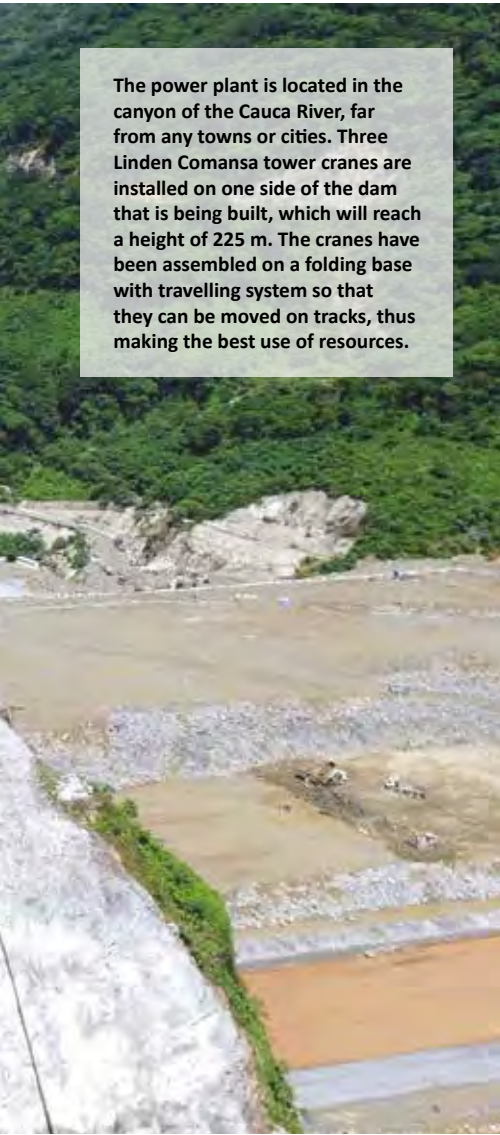
The 21LC450 has a maximum load capacity of 20 t and a height under hook of 54.6 m, whilst the 16LC185 can handle a load of up to 8 t and has a height under hook of 59.5 m.

The third Linden Comansa crane, an 11LC160, with a maximum load capacity of 8 t, has been placed in three different locations but always close to the other two cranes. It was initially installed



One of the cranes, an 11LC160, is being used to build the intake tunnels, just by the spillway.

in an area higher than the spillway so that it can be used to build the tunnel, which will provide road access to the spillway. Once this initial work was completed, the crane was moved to a slightly lower area to build the two intake tunnels, which will take water from the reservoir to the machine room and turbines, and will



The power plant is located in the canyon of the Cauca River, far from any towns or cities. Three Linden Comansa tower cranes are installed on one side of the dam that is being built, which will reach a height of 225 m. The cranes have been assembled on a folding base with travelling system so that they can be moved on tracks, thus making the best use of resources.

All images © CCC Iturango Consortium/EPM

then turn the mechanical energy into electrical energy.

At all these locations, the 11LC160 was set up with a height under hook of 40 m and also on a folding base with travelling system to allow it to be moved quickly. This way, it can also lift the different loads over a larger area than a stationary crane would be able to, thus making the best use of resources.

The modular structure of the cranes - comprised of parts that are light and easy to handle, thus making them easy to transport and assemble - was fundamental given that the power plant is located in the canyon of the Cauca River, in an area excavated from the mountain, where there is little flat ground, far removed from any towns or cities. Medellín is the closest city, located at around 170 km or about five hours from the power plant. ■

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THAITAN: DO IT ONCE, DO IT PROPERLY

SOUTHEAST ASIA CONSTRUCTION RECENTLY TRAVELLED TO THAILAND AND SPOKE WITH TRIN PIMHATAIVOOT, CEO OF THAITAN DRILLING, ABOUT THE COMPANY'S JOURNEY IN THE HDD INDUSTRY AND ITS PLANS TOWARDS THE FUTURE.

1. Mr Pimhataivoot, Thaitan was founded in October 2015, at the time when the global construction industry experienced a slowdown. Given such difficulty, how has growth been for the company?

Trin Pimhataivoot (TP): Although the global construction industry weakened, the HDD (horizontal directional drilling) sector in Thailand and Southeast Asia has continued to grow for the past few years. Since our establishment, we have carried out about 70 crossings in Thailand alone, installing approximately 20,000-m-long pipelines in total.

At the moment, our current workforce consists of 40 full-time staff in Thailand, but in the next five years, we plan to increase it to around 100.

I believe the vast amount of our success can be credited to our detailed preparation. We invest in adequate time and resources to customise our method in order to suit each project requirement, and also make sure there is a contingency plan in place to deal with emergencies. Our planning and engineering stage can take between three to six months, depending on the scale of the project.

Lack of preparation can delay a project significantly, resulting in high costs for our customers. And that is not our way. Our work principle is always 'we do it once, we do it properly' – right from the start through to the end, until our customer is satisfied with the result.



ABOVE: **Trin Pimhataivoot, CEO of Thaitan Drilling.**

BELOW: **The company provides a complete HDD solution, including planning, engineering and installation.**

2. You mentioned Thaitan also provides in-house engineering services. How much involvement do the engineers have during the planning stage?

TP: It is one of the most critical parts, due to the complicated nature of our projects. Our HDD engineers can help to design safe trenchless crossings for our customers. This work requires specialised skills and in-depth experience. We currently have three in-house engineers who collaborate with the rest of the team in the planning stage.

3. Speaking of complex projects, Thaitan's policies emphasise on safety and environmental management systems. Could you share how you implement them?

TP: Our commitment to safety and environmental protection serves as the foundation for our operational excellence. First, it is our policy to keep a safe working condition for all employees, customers and the public. We are benchmarking our safety performance against the oil & gas industry standard, which is considered the highest among other industries, and we are



working towards ISO certification.

When we accept a project, we will ensure that it doesn't pose any danger or cause disruption to the surrounding communities. We also conduct safety trainings regularly, and sometimes when the project is quite challenging, we have to carry out simulation trainings (role play scenarios).

As for environmental management system, it was also implemented for us to protect the environment by performing business operations in a sustainable manner. We try to reduce waste as much as possible, for example, by recycling our bentonite mud.

4. What sort of projects are you focusing on?

TP: We are presently focusing on onshore projects – 80 percent of them are still pipeline installations, and the remaining are cable installations. In some projects where crossings are very difficult, we also work hand in hand with our partners.

5. HDD technology has come a long way within the construction industry. Have you seen many changes in the Southeast Asia region?

TP: Now that customers in Southeast Asia - particularly Thailand - are becoming more aware of the technology, especially its advantages, they also expect more from us. They want better services, better equipment, and better end results overall.

As far as advancements in HDD technology are concerned, I believe automation would eventually make its way in the future. It's going to take a while.



Thaitan Drilling team on a pipeline project site in Thailand.



LEFT: Mr Pimhataivoot (on the right) with Jon Jamieson from Asia Technical Consulting Co Ltd (ATC), the exclusive dealer for Vermeer equipment in Thailand. Thaitan has acquired many HDD machines from ATC for use in its projects.

BELOW LEFT: Thaitan has carried out various onshore pipeline projects across Thailand, and the company is looking into expanding in the region.



6. With the booming HDD projects in Southeast Asia, do you have any plans to expand across the region?

TP: We already have a partner in Indonesia; it is a highly potential market for the trenchless industry, especially HDD. The Philippines is another market that we are setting our sights on.

The greater level of urbanisation in Southeast Asia is one of the factors that will drive the need for trenchless installations, as you just can't apply the open cut method through the cities anymore. Plus, with the benefits of HDD technology getting more valued, demand for it could increase tremendously.

We are positive about the future and the HDD sector is certainly looking good! ■

TAKING THE HIGH ROAD

CELEBRATING ITS 60TH ANNIVERSARY THIS YEAR, LIUGONG SHOWCASES VARIOUS MACHINES FOR THE GLOBAL MARKET. AMONG THEM ARE THE B160 BULLDOZER AND THE NEW 4180D MOTOR GRADER, WHICH ARE DESIGNED WITH INNOVATIVE FEATURES TO HELP THEM WITHSTAND HARSH CONDITIONS IN ROAD CONSTRUCTION PROJECTS WORLDWIDE. THE COMPANY SHARES WITH SOUTHEAST ASIA CONSTRUCTION THE MAIN HIGHLIGHTS OF THESE TWO POWERFUL MODELS.



ABOVE AND LEFT: Liugong's new 4180D motor grader features improved visibility and manoeuvrability, as well as better serviceability and controllability. The machine offers a maximum speed of 42 km/hr, operating weight of 15,500 kg, drawbar pull of 86 kN and blade width of 3,960 mm.



ABOVE AND LEFT: The 4180D with an articulated frame has a small turning radius and is equipped with an electro-hydraulic speed control system. The cab has also been improved to ensure greater visibility and operator comfort.

4180D motor grader

LiuGong's new D-series motor grader - the 4180D - is designed with improved visibility and manoeuvrability, as well as better serviceability and controllability.

"We have enhanced the visibility to the front and rear of the machine, making it easier and safer for the operators to work on the jobsite," said Gary Major, LiuGong's industrial design director.

The 4180D has a small turning radius resulting in better manoeuvrability, and is equipped with an electro-hydraulic speed control system. The motor grader, featuring an articulated frame, offers a maximum speed of 42 km/hr, operating weight of 15,500 kg, drawbar pull of 86 kN and blade width of 3,960 mm.

"The 4180D is a medium-range model with a Tier 2 engine. It will be part of a new product family in the future, along with smaller and larger models," said Mr Major.

The 4180D is powered by an electronically controlled high-pressure common rail engine, which delivers a rated power of 140 kW @ 2,200 rpm. It has a large 348-l capacity fuel tank to allow continuous operations. The motor grader is also fitted with ZF axle and gearbox for reliable performance. The rolling disc operating device features



The LiuGong B160CL bulldozer is suitable for wetland projects, featuring an operating weight of 18,500 kg, maximum torque of 830 Nm and blade capacity of 3.8 cu m.

excellent rigidity, high precision and a large working range, and is maintenance-free, said LiuGong.

LiuGong's motor graders are suitable for a wide range of projects such as highways, airports and other large areas of ground levelling. They are used for digging trenches, scraping and bulldozing, as well as for loose soil and snow removal operations. They can also work on farmland improvements and water conservancy projects.

Mr Major added, "More investments are now being made in road buildings, not only in China but also worldwide, so we expect to see increased demand for motor graders, rollers and bulldozers."

B160 bulldozer

LiuGong's B160 bulldozers, launched in 2014, consist of four types: standard, wetland, landfill and forest lumbering.

The B160C is the standard type, which features a well-matched power transmission system and high working efficiency. It has a blade capacity of 4.5 cu m, operating weight of 17,000 kg and maximum torque of 830 Nm.

The B160CL is designed for wetland projects, fitted with a low ground pressure undercarriage and mounted wetland blade. It has an operating weight of 18,500 kg, maximum torque of 830 Nm and blade capacity of 3.8 cu m.



ABOVE AND BELOW: LiuGong celebrates its 60th anniversary with commemorative models.



ABOVE AND BELOW: LiuGong's Changzhou factory in eastern China manufactures bulldozers, excavators and mining equipment.



The B160CR is suitable for landfill jobs. It is also fitted with a low ground pressure undercarriage, plus a mounted recycling blade. This model has an operating weight of 18,700 kg, maximum torque of 830 Nm and blade capacity of 10.4 cu m.

The B160 is intended for forest working environments, equipped with a powerful engine and advanced hydraulics. The rollover protection structure effectively protects the operator, and the front mounted cylinders help increase work efficiency. The model has an operating weight of 17,000 kg, maximum torque of 830 Nm and blade capacity of 4.5 cu m. The hydraulic winch is offered as an option, which can be used for transport of lumber and other traction operations.

All of the bulldozers are powered by Weichai engines that deliver 120 kW @ 1,850 rpm (net power).

"Our R&D teams in China and Poland have been involved in the development of LiuGong bulldozers," said David Beatenbough, LiuGong's vice president for R&D. "The teams also work closely together to develop Dressta bulldozers.

"The LiuGong bulldozers feature simpler technologies, compared to the Dressta machines, attracting customers in China and Southeast Asia. The Dressta bulldozers with their more advanced features are popular not only in Poland, but also in countries like Russia and some parts of Asia. The two brands serve different target markets and they have been successful in creating a name for themselves."

Continued on page 84...



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‘Belt and Road’ commitment

LiuGong is also marking its 60th anniversary with a ‘global tour’, starting from China and then going around the globe, with a stop in each overseas subsidiary.

“In the last few years, we have been investing heavily in innovations and recruiting more staff – especially engineers – as well as building manufacturing plants and R&D facilities,” said Zeng Guang’an, chairman of LiuGong Group. “For the next 60 years, we will continue to focus on innovations and also our customers. We will keep pursuing excellence in quality and supports, and working towards becoming a world-class respectable company.”

Additionally, LiuGong has reaffirmed its strategies for the Belt and Road Initiative (BRI). Speaking at the Belt and Road Forum in Beijing in May 2017, Mr Zeng said that the initiative has been integrated into the company’s 13th five-year strategy.

The BRI has brought a new impetus to LiuGong’s grand vision. The company has set up a business network in 58 of the 65 countries involved in the BRI, and there are also five overseas subsidiaries including two manufacturing facilities in India and Poland to support dealers and customers.

The BRI covers a vast territory of geographical diversity, such as plateaus, deserts and frozen earth. On top of this, the environments are made more demanding due to extremely hot summers and freezing winters, which inevitably leads to difficulties in the construction of infrastructure and place high demands on the construction equipment used.



The launch ceremony of China-Laos railway was held in December 2015 in Laos. It is the first official overseas construction project under the Belt and Road Initiative, which is planned to be completed in 2020. About 70 LiuGong machines are currently working on the project.

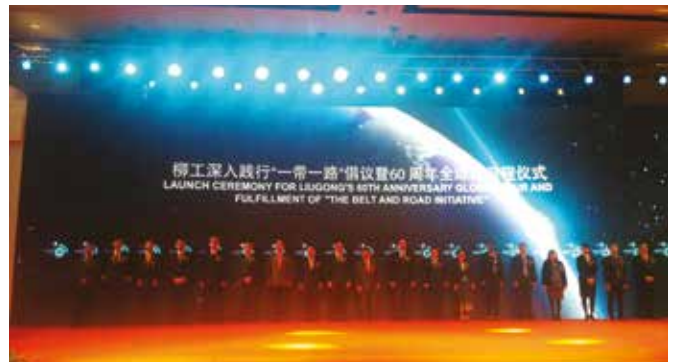


LiuGong machines also participate in the construction of Pakistan PKM expressway, one of the projects under the Belt and Road Initiative.



LEFT: Zeng Guang’an, chairman of LiuGong Group, speaking at the LiuGong global dealer conference in November 2017.

BELOW: The event also saw LiuGong reaffirm its strategies for the Belt and Road Initiative.



Offering a full line of extreme duty, intuitive machines, LiuGong provides total solutions for infrastructure projects. Its machines can be used for basic earthworks, road or railway projects, airport developments, tunnel and bridge constructions, and other tasks relating to transportation infrastructure, regardless of the challenges.

LiuGong further pointed out that its intuitive machines can be reliably operated anywhere and are smartly designed to allow for maintenance in the most isolated locations – making them perfect for meeting the demands of the BRI construction.

The company has already been involved in several BRI projects, including the 3rd Bridge and national power plant project in Turkey, Ashdod Port and Tel Aviv light rail construction in Israel, China-Laos railway construction, PMK expressway in Pakistan and China-Myanmar gas pipeline project.

The China-Laos railway, launched in December 2015, is the first official overseas construction project under the BRI. It begins in Kunming, Yunnan province, China and travels southward to Jinghong and Mohan until entering Laos through the Laos’ border city of Boten. After that, it goes past Luang Prabang and Vang Vieng before arriving in the capital Vientiane. About 70 LiuGong machines are working on the project.

The 418-km China-Laos railway is expected to be completed in 2020. Once operational, it would allow speeds of up to 160 kph for passenger trains and 120 kph for cargo. The route reportedly passes through one of the most extreme geographic and climatic regions in the world, and more than 60 percent of the construction will be bridges and tunnels. As a result, the project will need tough equipment that is flexible to work both in harsh environments and can deal with complicated construction requirements.

Speaking of its global expansion, especially along the BRI regions where the culture and politics are complicated, LiuGong highlighted that ‘acting local’ is the key to success. The company has long held a strong culture of localisation, openness and inclusiveness. By hiring local talent and participating in local activities, LiuGong has made an effort to integrate different cultures and established itself as a true localised company. ■

Website: www.liugong.com



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PTOLEMAIS UNIT V POWER PLANT



The Ptolemais Unit V lignite-fired power plant is deemed one of Greece's biggest construction projects in recent years. With a much higher level of efficiency than the older units, it will fire fuel at a considerably lower rate of consumption and emit significantly less CO₂ than the existing power plants in the country.

To meet the increased demand for electricity and relieve the strain on coal-fired power plants of older design, the 660 MW Ptolemais Unit V lignite-fired power plant is being built in Ptolemaida, an industry and mining region in northern Greece, about 500 km from the capital Athens. Greek construction company Terna SA was contracted to build the project.

The Ptolemais Units II to IV are lignite-fired plants of older design. The upcoming modern, high-efficiency Unit V is under construction on the unused site of the former 'Komanos' open-cast lignite mine. It is due to enter commercial operation in 2019. With a much higher level of efficiency than the older units, Ptolemais V will fire fuel at a considerably lower rate of consumption and emit significantly less CO₂ than the existing power plants in Greece.

The 'tallest' cooling tower

The cooling tower for the plant features 170 m high with a diameter of 110 m – it is said to be the tallest in Greece. To form this structure, Terna turned to Doka formwork systems.

Doka Greece and Doka's Global Expertise Centre Energy (GEC EN) in Amstetten, Austria, were commissioned to supply specially designed formwork for the first rings of the cooling tower. The solution is designed for the seismic-load classification of this region. According to Doka, this is the first time that the company has used an earthquake-proof design to form the first rings of a cooling tower.

Difficult access to the project is one of the challenges faced by the formwork engineers. Others include ultra-high specs for



the quality of the finished concrete and optimum dovetailing of the individual steps along with the construction timeline.

Another problem is the location of the power plant, which is in a seismically unstable part of Greece. Therefore additional materials are needed on the site and extra safety precautions have to be implemented on the project. In close cooperation, Doka Greece and the GEC EN in Amstetten elaborated a specific construction concept to maximise the efficiency of Doka formwork technology. For example, more braces, anchorages and stiffening profiles are added to ensure stability during construction.

The Doka Top 50 large-area formwork and Staxo 100 load-bearing towers were used at the start of the project and for forming the first ring. Then the SK175 automatic climbing formwork for cooling towers was brought in.

The SK175 cooling tower formwork is an all-mechanical automatic climbing system for pouring-section heights of 1.50 m. This solution is ideal for precision forming combined with short cycle times. The climbing scaffolds are carriers for the steel formwork and are climbed from section to section by at least 10 electro-mechanical lifting systems. As



TOP: Construction company Terna uses Doka SK175 cooling-tower formwork on the project. This automatic climbing system is suitable for precision forming combined with short cycle times.

ABOVE: The 108 pouring sections are being cast in a one-day cycle, so progress is fast and also safe.

it climbs, the formwork is safely guided up the structure. Climbing operations are virtually unaffected by wind velocity and weather conditions, said Doka. In total, 104 units of SK175 cooling-tower formwork are deployed on this project.

The 108 pouring sections are being cast in a one-day cycle, so progress is fast and also safe.

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“Doka gave us full support and the design of the SK175 system is excellent. So we’ve been able to stick to a very tight construction schedule,” said Makis Siderakis, construction manager for the cooling tower at Ptolemais Unit V. “Doka’s capability plus our well-organised site crew is the combination that enabled us to achieve a one-day cycle for a ring height of 1.50 m sooner than initially planned.”

The inclination of the formwork is adjusted from the automatic climber using adjusting spindles. The maximum angle of inclination is 22 degrees. “So even at a 70-m radius we can climb without any adaptations and all the geometries usually encountered in cooling tower construction are covered,” said Andreas Guttenbrunner, Doka’s engineering manager at the Global Expertise Centre Energy.

The units are climbed by a climbing winch and a gear motor. There are five to six motors mounted on each of the units for the interior and exterior formwork of the tower. These motors are repositioned horizontally whenever necessary. Reinforcement holders integrated into the scaffold permit fast, simple installation of the reinforcement.

Secured to the actual structure, the formwork is safely guided in all phases of climbing, so there are no problems with climbing at great heights even in windy conditions, said Doka. A safety system installed on the automatic climbing formwork incorporates fall protection, with limit-switch-triggered automatic shut-down to prevent overclimbing. The working platforms overlap and incorporate integral access and guardrail systems. Platform width is also optimised to help ensure a safe working environment for the construction crew. ■

Website: www.doka.com



Doka’s solution has been designed for the seismic-load classification of this region. The company said this is the first time it has used an earthquake-proof design to form the first rings of a cooling tower.

The background of the entire page is a complex, light blue architectural drawing or blueprint. It features various geometric shapes, lines, and patterns, including a large circular structure at the top center, a rectangular structure on the right, and a large, irregular shape at the bottom left. The drawing is composed of many fine lines and some larger, more prominent shapes, creating a technical and professional atmosphere.

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The 6.9 km long Ulriken Tunnel extends the railway link between Bergen and Arna on the west coast of Norway. After months of tunnelling through some of the toughest hard rock, the project was completed successfully.

ULRIKEN TUNNEL

Following months of excavating some of the toughest hard rock in Norway, Skanska Strabag Ulriken ANS joint venture finally made its breakthrough at the Ulriken Tunnel in late August 2017. The contractor drilled through the tunnel using a Gripper TBM with top advance rates of up to 170 m/week.

The new 6.9 km long Ulriken Tunnel extends the railway link between Bergen and Arna on the west coast of Norway. Passing through the Ulriken mountain, the tunnel is said to be the first major traffic project in Norway to be built with a Gripper TBM. The hard rock machine from Herrenknecht, named Ulrikke, has a diameter of 9,300 mm and drive power of 4,200 kW.

With compressive strength of up to 300 MPa, Scandinavian rock is regarded worldwide as the ultimate test for mechanised tunnelling technology. At the Ulriken Tunnel, the TBM cutterhead weighs 236 t and was equipped with a total of 62 19-in disc cutters to enable the machine drive through extremely hard gneiss with overburdens of up to 600 m.

Mechanised tunnelling

The drill & blast tunnelling method traditionally dominates in Norway. "The realisation that mechanical tunnelling is a real alternative even in the extremely hard rock now seems to be spreading in Scandinavia," said Eric Fouchault, Herrenknecht's project manager.

Compared to the traditional drill & blast method, mechanised tunnelling has a number of advantages, explained Herrenknecht. It has less impact on the mountain and provides highest safety for the crew, without the shocks of blasting. As such, the short distance of only 30 m from the existing operational railway tunnel was decisive in the use of a TBM at the Ulriken Tunnel. Furthermore, the machine technology can achieve higher average advance rates, especially over long distances.

According to Herrenknecht, TBMs are also preferred over the traditional drill & blast method in other Norwegian tunnel projects. One of them is the upcoming large-scale infrastructure project, the 'Follo



The Ulrikke tunnel boring machine breaks through the target wall. The cutterhead weighs 236 t and was equipped with a total of 62 19-in disc cutters to allow the machine drive through extremely hard gneiss with overburdens of up to 600 m.



Skanska Strabag Ulriken ANS joint venture made the breakthrough in late August 2017. The Ulriken Tunnel is said to be the first major railway project in Norway that has been built with mechanised tunnelling technology.

Line' in Oslo, where four Herrenknecht double shield TBMs –with a diameter of 9,900 mm - are creating one of the country's longest railway tunnels. In 15

months of excavation, more than 19 km of the approximately 38 km long total route has been driven as a tunnel. ■

Website: www.herrenknecht.com

CZECH D11 MOTORWAY



ATM CZ, a Czech Republic-based company has recently started work on a two-year project to extend the country's D11 motorway by 15.5 km. The road currently connects the Czech capital Prague and the city of Hradec Králové. Once the project is complete, it will continue to Smiřicemi. The motorway is part of European route E67 – the so-called Via Baltica – from Prague to the Finnish capital Helsinki by way of Poland, Lithuania, Latvia and Estonia.

Moving the earth

To move the vast amount of earth and materials on site, ATM CZ is relying on a Terex Trucks TA300 articulated dump truck. The company bought the machine from Terex Trucks' dealer Austro Baumaschinen (ABM). The TA300 is powered by a fuel-efficient five cylinder Scania DC9 engine. It has a maximum payload of 28 t and a 17.5 cu m heaped capacity.

"I chose the TA300 because of its excellent fuel economy, operator comfort and the service and support Terex Trucks provides," said Tomáš Michalička, owner of ATM CZ. The company specialises in large earthworks, road and motorway construction.

"My crew continually praise the TA300 for its simple and effective design. It has also been good to work with ABM again," continued Mr Michalička. "Although I am a first-time Terex Trucks customer, we've been working with ABM since 2012 and they've previously supplied us with other machines, such as excavators. We are extremely happy with the level of service and support they offer. In fact, things are going so well that I'm already



TOP: ATM CZ has started work on a two-year project to extend the D11 motorway in Czech Republic. The road currently connects the country's capital Prague and the city of Hradec Králové. When completed, it will continue to Smiřicemi.

ABOVE: To move the vast amount of earth and materials on site, ATM CZ relies on a Terex Trucks TA300 articulated dump truck. The machine is designed with a maximum payload of 28 t and a 17.5 cu m heaped capacity.

thinking about buying a second Terex Trucks articulated dump truck from ABM."

Terex Trucks range of off-highway articulated dump trucks are built to withstand extreme environments. They are ideal for construction, quarrying and mining applications. ■

Website: www.terextrucks.com

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NAPLES AFRAGOLA RAILWAY STATION



The first phase of Naples Afragola railway station has been opened. Featuring four levels, the iconic bridge-like structure covers an area of more than 30,000 sq m and rises to a height of 8 m above the level of the tracks.

After two years of construction, the first phase of Naples Afragola railway station was opened in June 2017. It is dubbed as the 'gateway to the south of Italy' due to its role in linking the north to the south of the country.

Featuring an iconic design, the station serves as a strategic hub for the regional and national high-speed railway network. Once working at full capacity - thanks to its future connection with the Circumvesuviana line - the station will be able to accommodate up to three million passengers.

The €60 million project was divided into two phases. Phase 1 involved the commissioning of high-speed railway service area as well as Level 2 of the building where the commercial services and west entrance are located. Phase 2 will see the completion of all works connected to the project for the Naples/Cancello link, which is planned to conclude in 2022.

Bridge-like structure

The Naples Afragola station was designed by late architect Zaha Hadid and built by contractor Astaldi Group for the owner RFI (Rete Ferroviaria Italiana), a subsidiary of the national railway company FS Italiane.

Developed over four levels, the bridge-like structure covers an area of more than 30,000 sq m and rises to a height of 8 m above the level of the tracks. The first level is for the movements of the trains which, during the first phase, will use four of the available platforms (two for arrivals and departures, and two for the trains that do not stop at the station). A further two platforms will be put into service during the second phase and they will be used for both regional trains and the extension to the Circumvesuviana line.

Installation of the metal and glass roof structure of the station, where Polyglass synthetic membranes were also used.



ABOVE AND BELOW: Where required, the concrete was repaired and levelled off with Mapegrout T60 and Mapegrout LM2K. Eporip was applied to seal any cracks in the concrete.



The second level comprises the ticket offices and hospitality lounges of the railway company, which will provide various services for the passengers. The third and fourth levels will be phased in shortly with shops and other commercial services.

The main body of the station measures 400 m in length. A large glass panel of more than 6,000 sq m is installed on the roof. The external area of the station will occupy 150,000 sq m with gardens and a carpark for around 500 cars - upon completion it will be extended to 1,400 cars.

Reinforced concrete is adopted for the base of the building, while glass panels for the roof over the commercial and shopping gallery. For the raised structure, the external shell of the building (around 20,000 sq m) supported by around 200 specially-shaped steel columns, is made from concrete and Corian, a material chosen for its high performance properties in these particular atmospheric conditions and its exposure to chemical agents.

The station is also designed with sustainability features, including solar panels that are integrated into the roofs, plus the combined ventilation and integrated cooling and heating systems - all of which help to reduce the amount of energy required over the years. In addition, natural light entering from above improves visibility in the station, the internal walls are mainly covered in glass, and the artificial lighting primarily uses LED to ensure higher efficiency.

Astaldi is one of the world's largest civil infrastructure construction companies based in Italy. It operates in more than 20 countries worldwide with an annual turnover of €3 billion, working on various projects including bridges, bored tunnels, highways, MRTs, high-speed railways and dams, among others. The company is also involved in the hospital/medical sector. Strengthening globally, Astaldi has recently opened its Singapore office.



The walls in the area alongside the platforms were protected against scuffmarks and scratches with Wallgard Graffiti Barrier.

Concrete protection and waterproofing

Mapei has also played a role in the project right from the start. The company supplied its systems for the construction and installation of the external shell and also for the floor coverings inside the station. Floor coverings have been installed up to Level 1 and most of Level 2, apart from the east gallery; while Levels 3 and 4 have been left in a semi-finished condition for the present time. The areas open to the general public have been cordoned off from the ones that are still closed, so that the station can remain fully operative.

The facades of the building are in exposed concrete, and thus Mapei repaired and levelled off the surfaces where required with Mapegrout T60 fibre-reinforced, sulphate-resistant thixotropic mortar and Mapegrout LM2K two-component, fibre-reinforced, thixotropic cementitious mortar mixed with corrosion inhibitor. To seal the cracks on the surfaces, Mapei applied Eporip two-component, solvent-free epoxy adhesive.

Not long after that, the delicate job of skimming the facades commenced. Mapei used Planitop Fine Finish, a light grey coloured one-component, ultra fine-textured cementitious skimming compound that gives the mortar a particularly high level of adhesion and excellent flow during application. Once the substrate was cured, it was treated with Malech micronised acrylic resin-based primer. This system evened out the absorption of substrates and promotes a better bond with the layer of paint applied afterwards.



ABOVE RIGHT AND RIGHT: The surfaces were skimmed with Planitop Fine Finish, which was specifically developed for this site. They were then finished off with Malech primer and Colorite Beton paint in a tailor-made RAL colour.



The article courtesy of *Realta Mapei Internazionale* no. 65

The entire surface was then painted with Colorite Beton semi-transparent, anti-carbonation paint.

In certain areas of the station such as the platforms, up to a level of 1.5 m above ground level, the walls were protected against scuffmarks and scratches with Wallgard Graffiti Barrier paint.

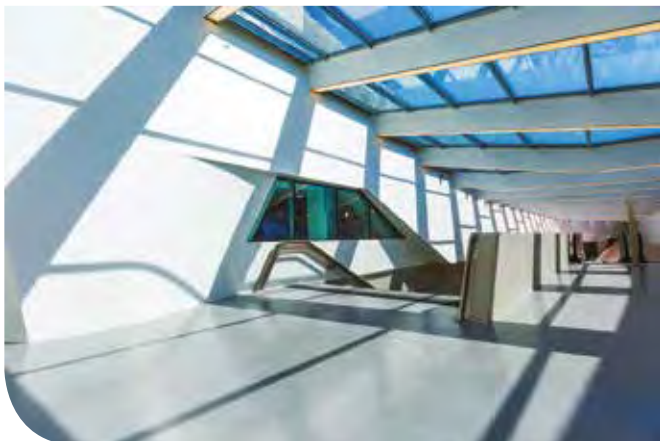
For some of the works on the roof, Mapei employed waterproofing membranes from its subsidiary Polyglass. The collector channels for the rainwater on the metal roof were coated with white, high-reflectance Mapeplan T B flexible, waterproof polyolefin membrane. The membrane was bonded to the metal sandwich support panels with Mapeplan ADS 300 adhesive.

The waterproofing work was carried out in two phases: the first phase was to pre-waterproof the collector channels prior to installation in the Carrara works, which was performed by the

specialised company contracted on the job; the second phase was the actual installation of the collector channels on site and then to blend in and finish off the waterproof membrane.

To form the resin floors inside the station (around 8,000 sq m), Mapei provided its Mapefloor System 31. This system is particularly recommended for floors areas where a multi-layered, non-slip resin coating with excellent mechanical properties and excellent resistance to chemicals and abrasion is required. The coating was formed by priming the floor with Mapefloor I 910 epoxy binder and then applying a layer around 0.8- to 1.2-mm thick of Mapefloor I 300 SL two-component, solvent-free, fillerised epoxy formulate. When needed, some of the areas were treated with Mapecoat I 600 W two-component, epoxy resin-based-formulate. ■

Website: www.mapei.com.sg



TOP, ABOVE LEFT AND ABOVE RIGHT: The gallery where the shops and commercial services are located, the corridors connecting various areas in the station and the waiting areas were coated with Mapefloor System 31.

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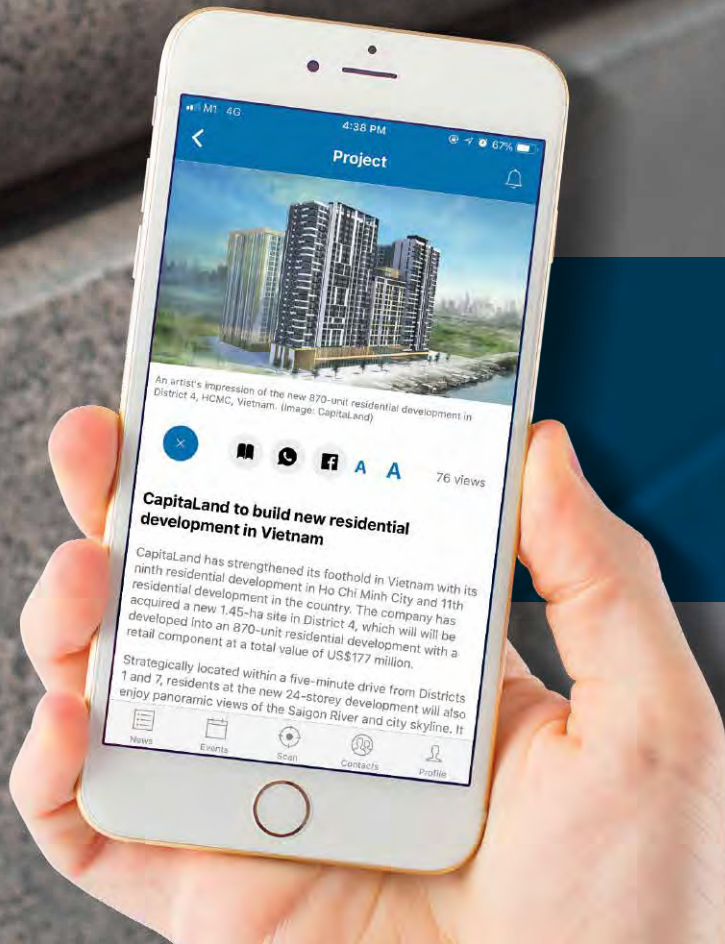


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