SOUTHEAST·ASIA CONSTRUCTION

JANUARY - FEBRUARY 2024

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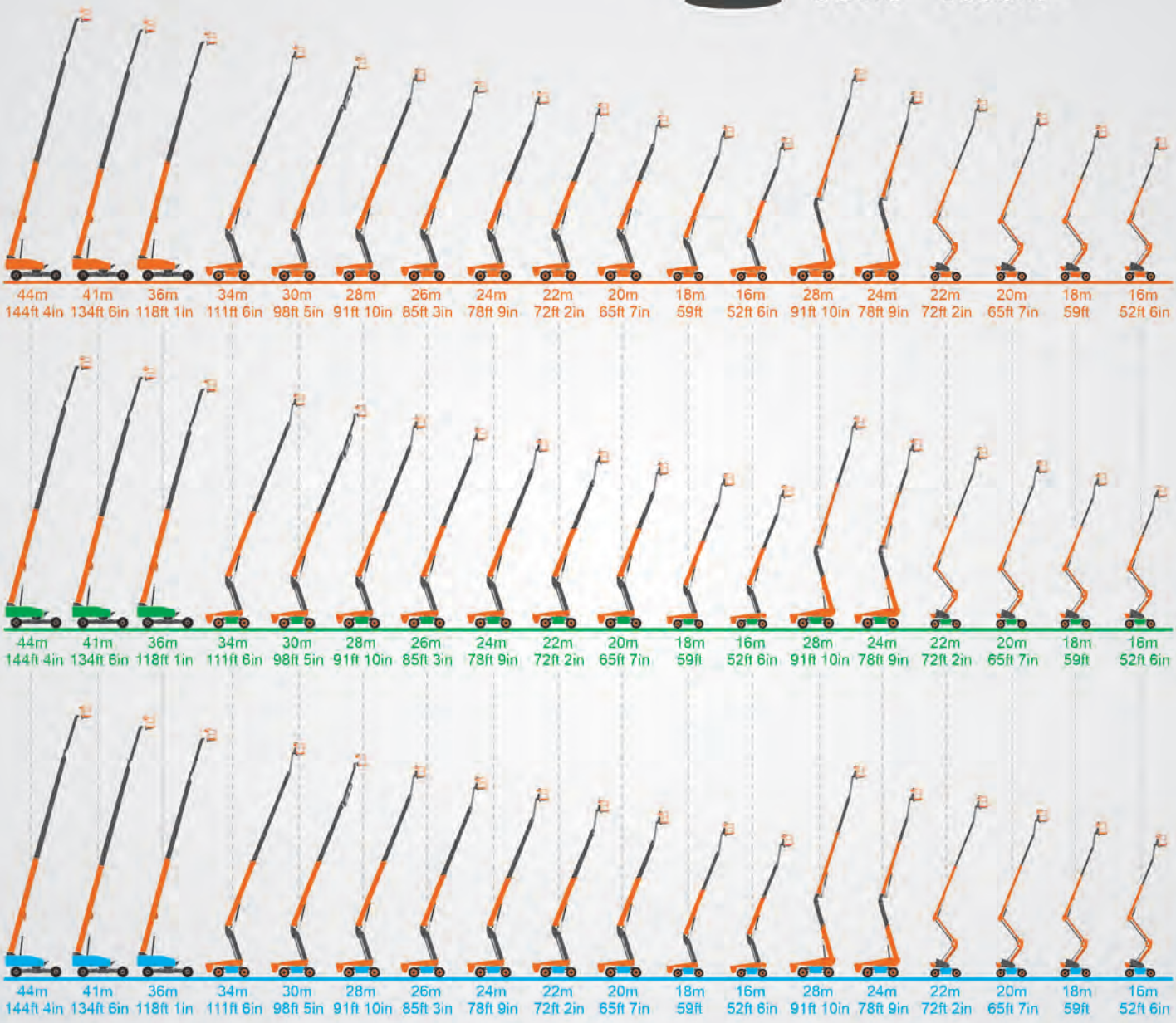

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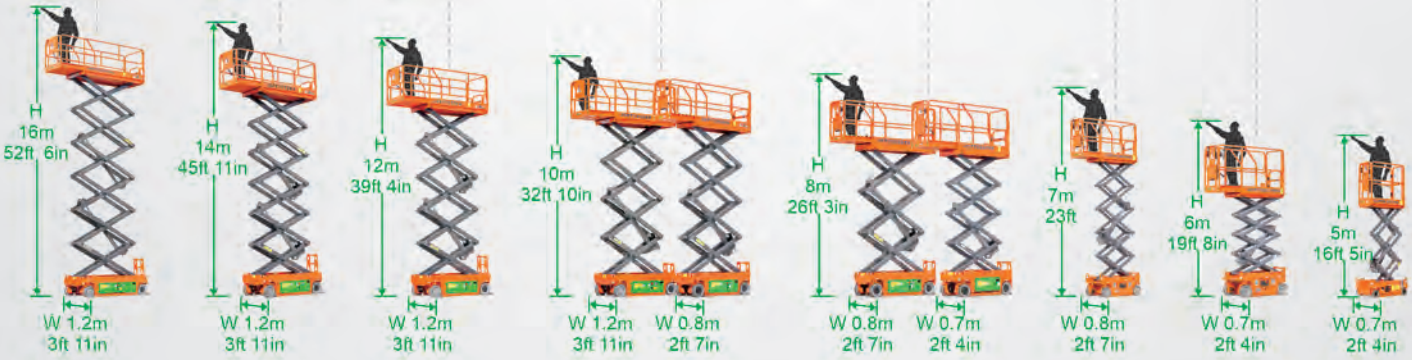

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ADB supports flagship Philippine bridge project

The Asian Development Bank (ADB) has approved financing of up to US$2.1 billion for the construction of a 32.15-km bridge connecting Bataan and Cavite provinces across Manila Bay. When completed, it will decongest Metro Manila, enable greater mobility of labour and goods, and enhance economic productivity in the Philippines' largest region of Luzon.

The Bataan–Cavite Interlink Bridge (BCIB), one of the government's flagship infrastructure projects, will complete the transport loop around Manila Bay and better link Metro Manila to central Luzon and nearby Cavite, Laguna, Batangas, Rizal, and Quezon provinces. The bridge will help boost economic activity in these areas, which together account for 60% of the country's gross domestic product.

According to ADB, the project will construct one of the world's longest marine bridges, including two cable-stayed bridges, 24 km of marine viaducts, and a total 8 km of approach road in Bataan and Cavite provinces.

"The BCIB represents the latest instalment in ADB's broader agenda of support towards strengthening urban and regional transport networks in and around greater Manila. This includes the South Commuter Railway, Malolos Clark Railway, and two other projects currently being prepared for financing – the Metro Manila Rail Transit Line 4 and the Laguna Lakeshore Road Network," said Scott Morris, ADB vice president for East and Southeast Asia, and the Pacific.

The BCIB project will cut travel time between Bataan and Cavite to 1.5 hours from 5 hours, and to about 2 hours from 4 hours between Bataan and Metro Manila. ADB said the traffic decongestion in Metro Manila and the reduced travel time will help lower annual greenhouse gas emissions in the Philippines by an estimated 79,000 t of carbon dioxide equivalent.

Image: Department of Public Works and Highways (via ADB)

The Bataan–Cavite Interlink Bridge (BCIB) project will feature one of the world's longest marine bridges, including two cable-stayed bridges, 24 km of marine viaducts, and a total 8 km of approach road.

The ADB-financed Infrastructure Preparation and Innovation Facility supported the project preparation, environment and social safeguards due diligence, and detailed engineering design for BCIB. The project will follow high technical standards to boost resilience to natural hazards and the effects of climate change, such as sea level rise, increase in temperature and heatwaves, and extreme weather events. The bridge will be built using low-carbon technologies and construction materials where applicable. ■

Tiong Woon, Mammoet form partnership to boost operations in Thailand

Singapore's Tiong Woon Corporation has announced a strategic alliance with Mammoet to expand its footprint in Thailand.

This partnership will enhance Tiong Woon's ability to cater to the evolving needs of existing customers in Thailand, and significantly broaden the group's service offerings to existing as well as new customers in the country, particularly within the heavy lift and haulage market.

It will also place both partners in a stronger position to offer, tender, negotiate and provide solutions in projects across Thailand involving their respective capabilities.

In addition, to reinforce its position in the transportation and heavy haulage industry in Thailand, Tiong Woon has acquired various assets from Mammoet, including transportation, heavy haulage and heavy lifting equipment.

The acquired equipment will enable Tiong Woon to undertake new, larger, and more complex projects for existing and new customers, further solidifying the group's reputation as a go-to partner for high-value, complex and challenging heavy lift and haulage solutions in Thailand and the region.

Ang Guan Hwa, executive director and CEO of Tiong Woon Corporation, said, "We are excited about the opportunities this strategic alliance and asset acquisition with Mammoet in Thailand brings to our organisation and our customers. This is yet another chapter in the group's growth story in the right direction. We will be positioned to deliver a wider suite of exceptional services to our customers.

"The investment also underscores our commitment to meeting the evolving needs of our customers and partners, and our vision for the group as the market leader in high-value, large, complex heavy lift and haulage solutions in Thailand and the broader region. We believe that this broadening of our strategic partnership with Mammoet in the Asia Pacific region augurs well for further growth in the region." ■

Image: Tiong Woon

The MOU signing ceremony between Tiong Woon and Mammoet. This collaboration will place both partners in a stronger position in Thailand.

JP Nelson delivers Sunward electric excavator to Singapore rail project

JP Nelson Equipment Pte Ltd has delivered a new Sunward SWE240FED battery-powered excavator to Singapore's Cross Island Line-Punggol Extension P103 MRT project. The company said this is the first fully electric 24-t excavator in Southeast Asia.

"The construction industry has been evolving at a rapid pace, driven by the need for cleaner and more sustainable solutions. One significant development in this regard is the introduction of fully electric excavators," explained JP Nelson. "These machines are revolutionising the construction sector by offering an eco-friendly and a more efficient alternative compared to their traditional diesel counterparts."

JP Nelson highlighted the key benefits of the Sunward SWE240FED electric excavator, which include zero emissions and a reduced noise level on the jobsite. It also offers higher energy efficiency and lower operating costs; and with fewer moving parts, the machine is easy to maintain.

The SWE240FED is powered by a high-performance LFP battery with a capacity of 400 kWh, allowing the machine to work for about six hours when fully charged. The charging time for the battery is up to one to two hours for fast charging.

The SWE240FED features an overall weight of 24 t, a bucket capacity of 1.0 cu m, and a tail swing radius of 2,770 mm. The machine has a travel speed of between 3.3 and 5.2 km/hr. The maximum digging depth and height are 6,750 mm and 9,710 mm respectively.

ABOVE: **The new Sunward SWE240FED electric excavator has been delivered to Singapore's Cross Island Line-Punggol Extension P103 MRT project.**

LEFT: **The SWE240FED is powered by a high-performance LFP battery with a capacity of 400 kWh, allowing the machine to work for about six hours when fully charged.**

Equipped with an integrated electric control and an intelligent remote control, the SWE240FED can adapt to various working conditions safely and efficiently. The excavator also comes with a quick coupler and an optional breaker.

JP Nelson further pointed out that "many construction companies aim to enhance efficiency and reduce their environmental footprint. As technology continues to evolve, electric machines are expected to play an even more significant role in the construction industry of the future." ■

LEFT: **The electric excavator features zero emissions and a reduced noise level on the jobsite. It also offers higher energy efficiency and lower operating costs; and with fewer moving parts, the machine is easy to maintain.**

Giken opens new facility in Japan to showcase press-in piling technologies

Japanese manufacturer Giken Ltd has established a new facility called 'Red Hill 1967', which showcases its press-in piling technologies. According to the company, since its opening, the facility has already attracted a significant number of visitors, including government agencies, contractors, users and shareholders.

Giken developed Silent Piler, dubbed the world's first reaction-based hydraulic pile jacking machine, capable of installing piles without noise or vibration. The company has been promoting its press-in technologies globally and they are now used in over 40 countries and regions.

This new complex, located in Konan-city, Kochi Prefecture, presents a variety of Giken machines, methods and structures. It was opened in May 2023 and consists of four areas, two of which are steel sheet pile-based buildings named 'Sozokan' and 'Research Building'.

1. Demonstration Area

In this area, various construction sites are reproduced with real machines on an actual scale, such as the Silent Piler, a pile press-in and extraction machine; GRB System for temporary work-free construction; and structures constructed by Implant Method.

For example, visitors can observe the Implant Lock Levee, which is designed to resist all types of levee breakage factors with great strength. They can also learn about the Gyropress Method, a rotary cutting press-in of tubular piles used for the maintenance and reinforcement of ageing infrastructures without the need for the removal of existing concrete structures.

In addition, there are construction models on display that show how the Implant Method can solve challenging conditions such as hard ground, railway adjacency, or headroom restrictions.

2. Sozokan: The Museum of Piling Machines

The structure of this building adopts sheet piles as the main structural materials and confined ground seismic dampers to create a steel spread foundation over soft ground to reduce ground subsidence in the event of an earthquake.

A total of 50 machines and equipment are exhibited at the museum, comprising the first Silent Piler, which is certified as a mechanical engineering heritage, plus Giken's most notable inventions and developments such as Silent Piler and Gyro Piler, and other piling machines with different principles. Visitors can look at the history of these innovations through the informative panels and videos.

3. Research Building

This facility is also constructed with steel sheet piles forming a continuous wall that integrates all the functionality of pile foundations, pillars and walls. As another world's first trial, a 2-m-diameter tubular pile has been deployed as the elevator shaft through which the elevator moves.

Here, visitors can find a theatre and exhibition hall – where the past, present and future of press-in principle and press-in technologies are explained – as well as an office space for research on various verification tests.

4. Kochi Factory 3

Kochi Factory 3 is the largest factory of Giken in Japan and was established as a base for accelerating product development for global expansion in 2019. It is used to develop, prototype and verify large-scale products. The building's foundation employs 54 tubular piles with 15.0 to 15.8 m in length, installed by the Gyropress Method. ■

Located in Kochi Prefecture, Red Hill 1967 displays a variety of Giken machines, methods and structures. It consists of four areas.

In the Demonstration Area, various construction sites are reproduced with real machines on an actual scale, such as the Silent Piler and GRB System.

ABOVE: **A total of 50 Giken machines and equipment are exhibited at the museum.**

LEFT: **The Research Building.**

Note: A tour of the facility is available, and bookings can be made through the website (https://redhill1967.giken.com/en)

PM Link signs MOU with Airsquire to accelerate digital transformation in Singapore's built environment

PM Link Pte Ltd, the project management subsidiary of CPG Corporation, has signed a three-year memorandum of understanding (MOU) with Airsquire Pte Ltd to accelerate the pace of digital transformation in Singapore's built environment sector.

The signing of the MOU aligns with Singapore's strategy to transform the built environment sector through the creation of a highly skilled workforce trained in the use of digital technologies throughout the construction and building life cycle. The MOU also seeks to establish and encourage local sustainable partnerships that create business value by sharing best practices and discovering new skillsets.

PM Link and Airsquire share the belief that effective collaboration across sectors can yield advantages, including closing the divide between resources and knowledge, promoting operational efficiency, and fostering an environment for experimentation and innovation.

"PM Link is constantly on the lookout for new tools that can enhance the delivery of our PM services. By collaborating with an innovative local technology firm like Airsquire, we are forging a cross-industry partnership that also benefits Singapore's built environment through the sharing of best practices and the discovery of new skillsets," said Tan Cheng Chuah, managing director of PM Link.

"Airsquire has long been working with and learning from digital engineering teams in Singapore. Through collaboration with PM Link, not only can we gain valuable insights from cross-industry experiences through feedback and learning, but we can also nurture technology and built environment talents through the joint creation of a digital culture," added Kyle Tan, CEO of Airsquire.

PM Link and Airsquire began collaborating in 2021 when the former was seeking local construction software developers to enhance the delivery of project management services for its clients. The Covid-19 pandemic highlighted the urgent need for efficient solutions to site monitoring, as people's movements to many project sites were restricted. At that time, Airsquire was launching its 360° virtual sites platform and was looking to deepen industry value through local partnerships. A partnership was thus born out of a strategic alignment of interests to collaborate on the practical implementation of 360° site monitoring.

Airsquire's virtual sites product is a 360° site reality capture solution (RCS) that allows stakeholders to view and interact, enabling all parties to remotely monitor on-site progress, identify potential conflicts or issues, and maintain the project schedule. During the trial collaboration, PM Link and Airsquire worked on two of PM Link's projects: additions and alterations work for the Family Justice Courts (FJC), and a new fitting-out for the multinational clothing company H&M's office.

The product was first implemented in the FJC project during the Covid-19 pandemic. With movement restrictions in place, Airsquire's 360° progress documentation, powered by AI, eliminated the need for lengthy site walks. PM Link's project managers were also able to improve client satisfaction through better communication about progress and issues via the immersive 360° virtual spaces.

In the case of H&M, the use of a cloud-based tool meant that the client, headquartered in Sweden, could be updated on construction progress by PM Link's local representatives because on-site progress could be easily demonstrated virtually. Productivity of the project managers was also improved through multiple location and site-monitoring enabled by same-day access to virtual sites, accompanied by swift generation of digital client reports. In both cases, feedback from the clients on this integration of technology was positive.

Under the MOU, for the next three years, PM Link and Airsquire will continue to work closely to further implement and standardise 360° digital workflows on real projects and enhancing productivity in the value chain. This collaboration not only ensures the ongoing improvement of the digital platform but also facilitates scalability to other project management initiatives under PM Link, benefiting more clients. ■

Deo Ca – IlSung JV to build Khe Net railway tunnels in Vietnam

Vietnam's Deo Ca Group, in a joint venture with South Korea's IlSung, has secured a VND552 billion contract for the construction of two tunnels on the Hanoi – Ho Chi Minh City railway line.

Awarded by the Ministry of Transport's Railway Project Management Unit (PMU-Rail) in December 2023, the contract package XL01 involves building two tunnels as part of the Khe Net Pass Rehabilitation Project on the Hanoi – Ho Chi Minh City railway line.

The package XL01 is located in the Huong Hoa and Kim Hoa communes, Tuyen Hoa district, Quang Binh province. The first tunnel has a length of 620 m and is scheduled for completion in 23 months, while the second tunnel spans 393 m and is expected to be completed in 13.5 months. Both tunnels feature a width of 10 m.

According to Deo Ca, by constructing mountain tunnels, the route of the railway can be adjusted to enhance speed, shorten travel time, improve railway infrastructure, and ensure safe and smooth traffic on the Hanoi – Ho Chi Minh City railway line.

Earlier, Deo Ca has won several expressway projects in Vietnam, including the Quang Ngai – Hoai Nhon, Cam Lam – Vinh Hao, and Dong Dang – Tra Linh. The group said it has also collaborated with universities, vocational colleges, and international partners to conduct training programmes and cultivate skilled personnel for railway and metro projects. ■

Malaysia's Ponterosso Technics takes delivery of Cat 352 and 333 excavators

Tractors Malaysia recently hosted a day of celebration for its customer, Ponterosso Technics Sdn Bhd, who bought seven excavator models from the Cat 352 and Cat 333 range.

The event took place in November 2023 in Dungun, Terengganu. Tractors Malaysia said this celebration focused on showing appreciation towards its customers, alongside building new relationships with the local business community.

The Next Generation Cat 352 hydraulic excavator with a variable gauge undercarriage offers contractors up to 45% more operating efficiency, up to 10% more fuel efficiency, and up to 15% less maintenance costs compared to the model it replaces, the 352F.

Meanwhile, the new Cat 333 hydraulic excavator is built for tough applications. The machine has an increased bucket size, up to 10% more bucket force and up to 15% more stick force than the Cat 330 to maximise performance. In addition to its 15% more digging force, the 333 excavator boasts wide track gauge and reinforced structures for increased stability and durability. Extended maintenance intervals combine with a fuel-efficient hydraulic system and two engine power mode options to lower cost-per-hour operation.

The 333 excavator delivers reliable operation and increased productivity when working in challenging applications. Reinforced linkage, sticks and booms help to provide higher digging forces when excavating tough materials. Further increasing durability, the frame of the machine is reinforced to ensure a long service life while performing at a higher capacity.

ALL IMAGES: **A special event organised by Tractors Malaysia for its customer, Ponterosso Technics Sdn Bhd, who bought seven excavator models from the Cat 352 and Cat 333 range.**

Powered by a 260-hp Cat 7.1 engine, the 333 excavator features two engine operating modes – Power and Smart – to match the machine to jobsite conditions. The Power mode delivers maximum power to meet the most demanding tasks, while the Smart mode automatically matches engine and hydraulic power to digging conditions, offering up to 10% fuel savings.

Combined with higher digging forces, the 333 excavator's large bucket capacity efficiently moves more material in fewer passes to improve productivity. This versatile machine has auxiliary hydraulic options to power a wide range of Cat attachments, including buckets, grapples, hydraulic hammers, pulverisers, sheers, vibratory plate compactors and multi-processors.

Furthermore, the 333 excavator has two levels of fuel filtration that provides enhanced engine protection from diesel contaminants. A double element air intake filter with integrated pre-cleaner features high dust capacity. Lowering fuel consumption, a high-efficiency hydraulic fan cools the engine on demand and offers an optional reverse function to keep the cores clean.

Featuring a sloped design, the track frame of the 333 excavator prevents mud and debris accumulation to reduce the risk of track damage. Grease sealed between track pins and bushings reduces travel noise and prevents debris infiltration to increase undercarriage life. ■

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MyCrane teams up with Equip9 on technical and commercial projects, exploring AI technology

Online crane rental platform MyCrane and aggregated digital platform Equip9 have signed a memorandum of understanding (MOU) to work together on joint technical and commercial projects. This agreement was signed during Excon, South Asia's largest construction equipment event that took place in Bengaluru, India, on 12-16 December 2023.

MyCrane developed the world's first online crane rental platform (www.my-crane.com) in 2021, helping customers save time and money when they need to hire a crane. Its uniform quotation system enables proposals from suppliers to be easily compared, negating the need to manually contact rental companies.

Based in Pune, India, Equip9 is an AI-enabled start-up that has developed an app for everything related to heavy equipment. With over 30,000 registered users, the app caters to a diverse audience of industry professionals, including operators, mechanics, rental equipment and owners, resellers, virtual dealerships, suppliers, financiers, e-learning and other entities.

MyCrane and Equip9 will work together to advance technical and commercial projects, particularly focusing on how AI can be used to power recommendation and selection models, including those to identify the most appropriate lifting equipment, or rental provider.

Under the MOU, MyCrane will assist Equip9 in expanding its reach beyond India, especially in the Middle East, while Equip9 will help MyCrane increase its penetration in the Indian market. MyCrane announced the launch of its wholly-owned operations in India in September 2023, following the appointment of industry partners Rajiv Waichal and Ganesh M. Patil.

"Both MyCrane and Equip9 share a common interest in ensuring the construction sector reaps the benefits of digitalisation that are present in many other segments," said Andrei Geikalo, CEO and founder of MyCrane.

Andrei Geikalo, CEO and founder of MyCrane (right) and Gaurav Bhushan, founder of Equip9 signed the MOU at Excon 2023 in India.

"With this agreement, we are establishing a formal basis of collaboration to better assist our customers, providing them with the best digital tools to help them to work more efficiently, while increasing sustainability and reducing waste at the same time.

"By partnering with Equip9, MyCrane will continue to innovate and offer the most advanced technology, and I am particularly excited to explore how AI might be used to match our customers with the most appropriate crane supplier. By joining forces, we will also be able to boost our visibility in a critical market for MyCrane."

Gaurav Bhushan, founder of Equip9, said, "Collaboration among start-ups cultivates innovation and sustainable growth. A faster search with the Equip9 app and the dedicated crane rental platform of MyCrane will make the construction and heavy equipment business easy." ■

Philippine contractor Megawide wins residential project in Laguna

The Precast and Construction Solutions (PCS) unit of Megawide Construction Corporation has secured a new contract from Philippine housing developer Century PHirst Corporation (CPC), a wholly-owned subsidiary of Century Properties Group Inc (CPGI).

The two companies sealed a new precast supply and install contract for PHirst Sights Bay – a residential development under CPC by Century Properties located in the municipality of Bay, Laguna province.

"This new project firmly reinforces the credibility of PCS as a dependable partner in the Greater Manila area and is a testament to the [Megawide] Group's engineering solutions overall," said Markus Hennig, executive vice president for Megawide PCS.

The contract covers the supply of precast materials to build a total of 1,816 units in the municipality's Barangay Puypuy. This makes about 20,000 external housing units of PHirst delivered by Megawide PCS since the two parties started their partnership in 2018.

PHirst Sights Bay will feature two types of residences – a two-storey townhouse that will comprise 1,108 units, as well as a modified two-storey loft-type with 708 units, for which PCS created a new precast design. Construction work on the project is currently underway, with completion expected by December 2025.

Megawide PCS delivers end-to-end engineering innovations that enable speed to market, more environment-friendly processes, and lower long-term costs, aside from lessening manpower requirements on construction sites. The company produces up to 131,000 cu m of precast products annually. ■

Denzai Huationg and Peck Tiong Choon acquire first Zoomlion ZAT2500V all-terrain cranes in Singapore

Antar Cranes Services Pte Ltd has handed over three units of Zoomlion ZAT2500V to Denzai Huationg Pte Ltd (one unit) and Peck Tiong Choon Leasing Pte Ltd (two units) in September and October 2023 respectively.

The ZAT2500V is a five-axle, 250-t-capacity all-terrain crane with a main boom length of 88 m, which is said to be the longest in its class. There is also an optional fixed jib of up to 33.5 m to increase the total boom length to 115.5 m.

According to Antar Cranes, the three units acquired by Denzai Huationg and Peck Tiong Choon are the first three Zoomlion ZAT2500V cranes in Singapore. "This model will meet the demand from our customers for a new 250-t all-terrain crane that can replace their older unit," said Andrew Tan, general manager of Antar Cranes.

"Many of our customers in Singapore require cranes that are less than 15 years old, especially for use on LTA and HDB projects."

Mr Tan added, "Another benefit of the ZAT2500V is its long boom. The crane can carry out a variety of tasks without the need to install an additional jib, thus reducing logistics and manpower requirements."

Andrew Tan, GM of Antar Cranes (right) hands over the Zoomlion ZAT2500V to Peck Tiong Choon.

With a small outrigger width of 8.3 m, the ZAT2500V is also highly versatile and can be easily deployed on restricted jobsites. Plus, the crane has the option to place its counterweights in two different positions: the front position is suitable for operations in a tight space, while the rear position allows the crane to provide a better lifting capacity.

For further ease of operation, the ZAT2500V is equipped with an automatic telescopic system, which enables the operator to select the boom length automatically via a screen panel. All the machine's functions are displayed on a 10.4-in, two-in-one LCD (touch screen) panel, which is designed to be user friendly. The cab can be tilted by 0-20° to improve the operator's field of vision and reduce fatigue.

In addition, the Zoomlion ZAT2500V has a central lubricating system for the superstructure and the chassis. All the lubricating points are automatically supplied with the correct grease quantity for prolonged crane service life and easy maintenance.

By adopting the CAN Bus technology, the superstructure and the chassis can monitor the outrigger pressures and the tilting angle of the chassis frame in real time to ensure a safe operation. Several encoders and sensors are also available to help keep track of the machine in real time, enhancing efficiency and safety.

As more projects are taking place across Singapore, more cranes will be needed to support contractors in delivering their jobs. Mr Tan pointed out, "The local construction industry will be busy for a while, at least in the next three to five years, with a number of major projects currently ongoing – such as the Cross Island Line (CRL), Jurong Region Line (JRL) and North-South Corridor (NSC) by LTA, public housing projects by HDB, and various private developments."

Denzai Huationg has also received a unit of Zoomlion ZAT2500V from Antar Cranes.

Mr Tan said that in general, the future of Southeast Asia's construction industry is looking positive. "A wide range of infrastructure developments are being implemented throughout the region, including airport projects in Vietnam, highway projects in Thailand, wind power projects in the Philippines and Thailand, the Johor Bahru-Singapore RTS Link, as well as the East Coast Rail Link (ECRL) and MRT projects in Malaysia, to name just a few." ■

Ammann to acquire Volvo CE's ABG Paver business

Volvo Construction Equipment (Volvo CE) has reached an agreement to divest its ABG Paver business to the Ammann Group, including the ABG production and technology centre in Hameln, Germany.

The agreement will benefit both parties by strengthening Ammann's product portfolio and distribution network, while allowing Volvo CE to continue to focus on developing sustainable solutions and future technologies and services, in line with the company´s strategic direction.

Based in Switzerland, Ammann is a leading global supplier of mixing plants, machines and services for the construction industry with core expertise in roadbuilding and transportation infrastructure, which the company intends to develop further through the ABG Paver business expansion.

According to Volvo CE, the number of its employees impacted as a result of this announcement is approximately 400. With the acquisition, production of Volvo CE compaction equipment in Hameln will also be phased out over time.

Customers will continue to have access to the ABG paving range, as well as aftermarket and other services, through Ammann dealer network and some selected Volvo CE dealers.

In a separate statement, Ammann said the transaction includes the transfer of Volvo CE's paving businesses in Linyi (China) and Bangalore (India) as well as the ABG facility in Hameln.

"This strategic acquisition completes the depth of our product offerings and makes the solutions we offer customers more comprehensive," said Hans-Christian Schneider, CEO of Ammann. "The acquisition will also position Ammann with a suite of solutions, covering everything from asphalt plants to paving and compaction."

An ABG paver from Volvo CE.

In addition, Ammann will leverage its industry knowledge and customer relationships to guide development of the pavers, with ABG in Hameln becoming the Centre of Excellence for paving operations within the group.

The transaction is expected to be completed in the first half of 2024. ■

Tadano to acquire Nagano Industry

Tadano has entered into an agreement to acquire all the shares of Nagano Industry Co Ltd with its shareholders.

Founded in 1968, Nagano Industry is a renowned manufacturer of self-propelled crawler aerial work platforms in Japan, with sales of 5.6 billion yen in 2022. The company's products are highly specialised and used in a wide range of fields, including construction and civil engineering, as well as factories, shipbuilding and maintenance sites.

At the same time, Tadano manufactures aerial work platforms that meet the diverse needs of its customers. This new acquisition will enhance the company's ability to deliver a broader range of solutions, as Tadano will now be able to include self-propelled aerial work vehicles in its product offerings – a category in high demand worldwide.

With a market share of over 30% in Japan for truck-mounted aerial work platforms, Tadano is poised to leverage Nagano's advanced development and manufacturing technologies to fuel further growth in the aerial work vehicle business. ■

RIGHT: **Nagano articulated boom lift.**

LEFT: **Nagano Industry is a renowned manufacturer of self-propelled crawler aerial work platforms in Japan.**

ABOVE: **Tadano AT-150S (Super Deck) aerial work platform.**

BELOW: **Tadano AT-110TTE aerial work platform.**

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Website: www.geoconnectasia.com

BuildTech Asia
19 to 21 Mar 2024
Singapore Expo
Singapore
Website: www.buildtechasia.com

Trenchless Asia
26 to 27 June 2024
SMX Convention Centre Manila
Metro Manila, The Philippines
Website: www.trenchlessasia.com

CBA Expo (ConsBuild Asia)
22 to 24 Aug 2024
Bangkok International Trade & Exhibition Centre
Bangkok, Thailand
Website: www.consbuildasia.com

BCT Expo (Building Construction Technology Expo)
18 to 20 Sept 2024
Impact Exhibition and Convention Centre
Bangkok, Thailand
Website: www.bct-construction.com

BuildXpo Malaysia
20 to 24 Oct 2024
Malaysia International Trade and Exhibition Centre
Kuala Lumpur, Malaysia
Website: www.buildxpo.com.my

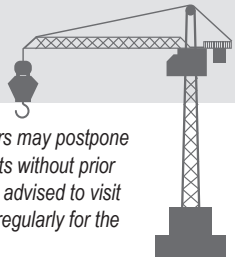
Philconstruct
7 to 10 Nov 2024
SMX Convention Centre Manila &
World Trade Centre Metro Manila
Metro Manila, The Philippines
Website: www.manila.philconstructevents.com

bauma China
26 to 29 Nov 2024
Shanghai New International Expo Centre
Shanghai, China
Website: www.bauma-china.com

// Events outside Asia

World of Concrete
23 to 25 Jan 2024
Las Vegas Convention Centre
Las Vegas, USA
Website: www.worldofconcrete.com

bauma
7 to 13 Apr 2025
Munich Trade Fair Centre
Munich, Germany
Website: www.bauma.de



Note: *The organisers may postpone or cancel their events without prior notice. Readers are advised to visit the event websites regularly for the latest update.*

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BuildXpo Malaysia 2023 closes on high note

BuildXpo Malaysia 2023, hosted by the Construction Industry Development Board (CIDB) Malaysia and organised by Qube Integrated Malaysia, has concluded its three-day exhibition in conjunction with International Construction Week (ICW) 2023. The event was held on 15-17 November at the Malaysia International Trade and Exhibition Centre (MITEC) in Kuala Lumpur.

According to the organiser, BuildXpo drew close to 10,000 international and local trade visitors, with nearly 200 booths from local and international construction players across the supply chain, and achieved almost RM500 million in trade value.

"[2023] marked the 22nd edition of the International Construction Week and the inaugural year for BuildXpo. The quality of trade visitors and high-level discourse facilitated through this platform is a testament to the construction and building industry's leadership and sought after capabilities," said Dato' Sr. Mohd Zaid Zakaria, CEO of CIDB Malaysia.

The trade value generated comprises RM117.8 million in potential sales from 126 business meetings that took place during the International Sourcing Programme (INSP) organised in conjunction with BuildXpo. A total of 42 Malaysian companies (sellers) were matched with 19 foreign companies (buyers) from seven countries, including Cambodia, Vietnam, Philippines, Thailand, Hong Kong, Kazakhstan and Germany.

The business discussions at the INSP revolved around sourcing of materials, technologies and services, such as heavy machinery, roofing and solar lights. Also in high demand were building information modelling (BIM) software solutions, drones, smart building technologies and integrated engineering services.

The organiser added that the engagements through bilateral meetings with high-level policymakers such as Zambia Minister of Infrastructure and Housing, Charles Milupi, and representatives from the Zimbabwe Ministry of National Housing and Social Amenities also contributed to the generation of potential sales at BuildXpo.

The exhibition floor featured a wide range of innovations, showcasing high-tech extended reality tools, simulators, immersive built structures and eco building materials. Among the exhibitors were Petronas, MRCB, Gamuda, YTL Cement, Malaysia Green Building Council (MGBC), the Small And Medium Enterprises Association (SAMENTA), MCC Overseas (M) Sdn Bhd, Cement Industries of Malaysia Berhad (CIMA), Majlis Amanah Rakyat (MARA), and Malaysian Timber Industry Board (MTIB).

Some of the innovations on display included: the virtual reality (VR) goggles at the MARA pavilion, which highlighted how TVET students at Kolej Kemahiran Tinggi Sri Gading are empowered with an immersive experience mimicking real-world site visits; and the VR welding simulator at the CIDB Tech pavilion that simulated welding for training purposes, allowing visitors to experience a smooth assimilation between the digital and real-world application. Embedded AI technology also enabled users to identify defects in a welding exercise for a comprehensive learning experience.

The drone technology by Akademi Binaan Malaysia demonstrated the potential of robotics in construction. Malaysia is said to be the first in Southeast Asia to deploy the SkyGauge, a drone with remote ultrasonic technology used for inspection and non-destructive testing of tall structures, thus minimising worker risk. Examples of applications include testing for corrosion and metal thickness.

ALL IMAGES: **Hosted by CIDB Malaysia, BuildXpo drew close to 10,000 international and local trade visitors, with nearly 200 booths from local and international construction players across the supply chain.**

In addition, visitors were able to view the smart helmet at the Petronas pavilion, a data-driven, smart industrial-grade safety helmet. This wearable helmet-mounted computer is an Internet of Things (IoT) solution which enables connectivity, data capture and live wireless monitoring.

The 2023 Malaysian Structural Steel Association (MSSA) Open Ideas Competition, themed 'Synergising Architectural Creativity and Engineering Precision', held its final judging and award ceremony at BuildXpo. Out of the 19 submissions from seven universities, Universiti Sains Malaysia (USM) emerged as a double podium finisher, clinching the first and third place, while Universiti Teknologi MARA (UiTM) took the second place. USM's winning submission – titled 'TxT (Township multiply Township) – impressed the judges by addressing space scarcity with a vertical design engineered to free-up the ground level for community activities.

BuildXpo Malaysia, in conjunction with ICW, is scheduled to return from 20 to 24 October 2024 at MITEC. ■

Website: www.buildxpo.com.my

Geo Connect Asia to return in March 2024

The next edition of Geo Connect Asia will be held from 6 to 7 March 2024 at the Sands Expo and Convention Centre, Marina Bay Sands, Singapore, with the theme 'Geospatial driven impacts: underground, ground and sea to sky'.

Working with the Singapore Land Authority (SLA) as its strategic partner, Geo Connect Asia provides a platform for the introduction of geospatial-based solutions across the region. The event is organised by Montgomery Asia.

Geo Connect Asia 2024 will be co-located with three major shows: Digital Construction Asia, aimed to help meet the demands for digitalisation in the construction industry; Drones & Uncrewed Asia (formerly Drones Asia), which serves as a platform for the region's UAV markets showcasing the latest in aerial, unmanned and ground-based solutions; and the inaugural Marine & Hydro Asia, focusing on the hydrospatial challenges of managing key issues related to Asia's coastal and marine waters.

According to the organiser, more than 130 companies are expected to take part in the combined exhibitions, with more than 70 speakers contributing to the associated conferences. Altogether, the event is anticipated to draw more than 3,500 visitors. ■

Website: www.geoconnectasia.com

RIGHT: **The next Geo Connect Asia will take place on 6-7 March 2024.**

New multilingual guidance aims to boost standards in powered access equipment rental

The International Powered Access Federation (IPAF) has taken another step forward in the internationalisation of its guidance for equipment rental companies and users of powered access equipment.

In August 2023, the organisation launched the IPAF Rental Standard at its Asia Conference in Thailand and has now published versions in English, Spanish, French, German, Dutch, Italian, and Chinese to serve the global rental market.

The IPAF Rental Standard was created to share recognised industry good practices and help rental companies comply with safety requirements and important legislation, and to assist them in consistently delivering excellent customer service. It also enables contractors and end users to better understand what a good rental experience should look like and allows them to standardise the supply of powered access equipment.

Written by a group of industry experts, the standard comprises a set of guidelines for equipment rental companies, as well as contractors and end users of powered access equipment.

IPAF Rental+ scheme manager Martin Wraith said, "We're delighted to have made the IPAF Rental Standard more accessible for equipment rental companies and their customers around the world.

"By adopting this voluntary standard, rental companies, contractors and end users of powered access equipment can increase safety, reduce incidents, and avoid lost working time.

"Voluntary compliance with the IPAF Rental Standard forms a stepping stone to IPAF Rental+ certification, which offers rental members independently-verified assurance of compliance to the

standard."

Members of IPAF Rental+ are audited annually to ensure they comply with the requirements of the IPAF Rental Standard and promote continuous improvement.

IPAF CEO and managing director Peter Douglas said, "IPAF Rental+ is a badge of professionalism across the powered access industry. All of our UK hire company members have been mandated to achieve IPAF Rental+ certification since 2017, and our Irish Council recently introduced the same requirement for the island of Ireland.

"It is fantastic to see the adoption of the rental standard gaining momentum, and this new multilingual resource gives the project a further boost." ■

Website: www.ipaf.org/en-gb/ipaf-rental-standard

IPAF reaches 500,000 ePAL app download milestone

The International Powered Access Federation (IPAF) launched the ePAL app in June 2021 for operators of mobile elevating work platforms (MEWPs) and mast climbing work platforms (MCWPs). This app has now achieved the milestone of 500,000 first-time downloads.

Available in seven languages, the app is free and contains digital certification of training, including the IPAF Powered Access Licence (PAL) Card. It also allows sharing of safety guides and messages, logs machine use time and machine familiarisation, and can be used to report incidents and near misses.

"Reaching half a million downloads is a major milestone and a clear indicator that the powered access industry has embraced our digital approach," said Peter Douglas, IPAF CEO and managing director. "ePAL provides easily-accessible assurance that MEWP operators hold the right qualifications and helps to keep industry colleagues informed on safe working-practices.

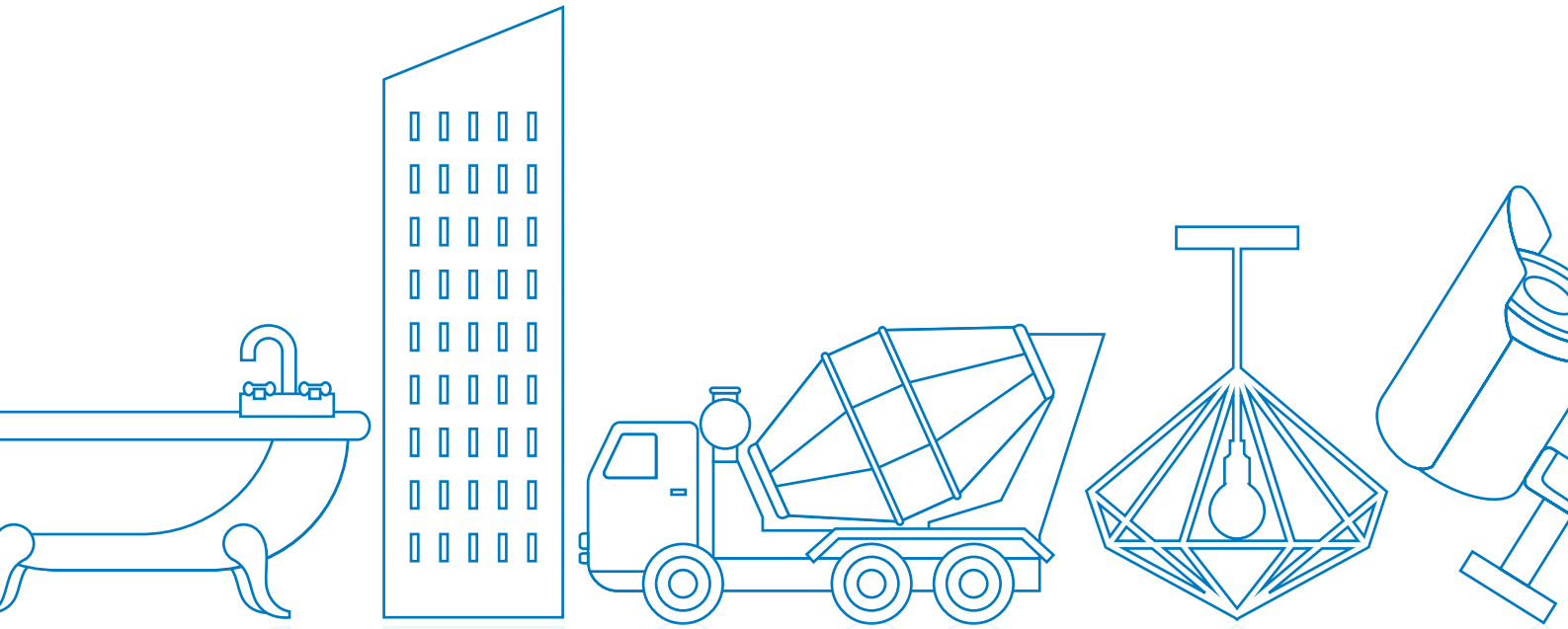
"It also gives easy access to our accident reporting portal, helping to build a global picture of safety issues that informs our training, advice, communications and campaigns. The direct connection the app creates with powered access users around the world is central to our work."

Besides supporting safety work, the app has also helped to reduce the environmental impact of IPAF's training and

certification programme.

"ePAL has helped us to significantly reduce our carbon footprint by slashing the number of plastic PAL Cards and paper certificates sent around the world each," said Mr Douglas. "Offering the PAL Card digitally also means lost cards and the associated costs have been eliminated for ePAL users."

The team at IPAF developed the app in partnership with member firm Trackunit. ■



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Dingli introduces BA11NE mini electric articulated boom

Dingli has launched a new mini electric articulated boom lift, the BA11NE, which offers a maximum working height of 10.8 m and a maximum load of 227 kg. The machine is driveable at full height, especially designed for narrow and tight working conditions.

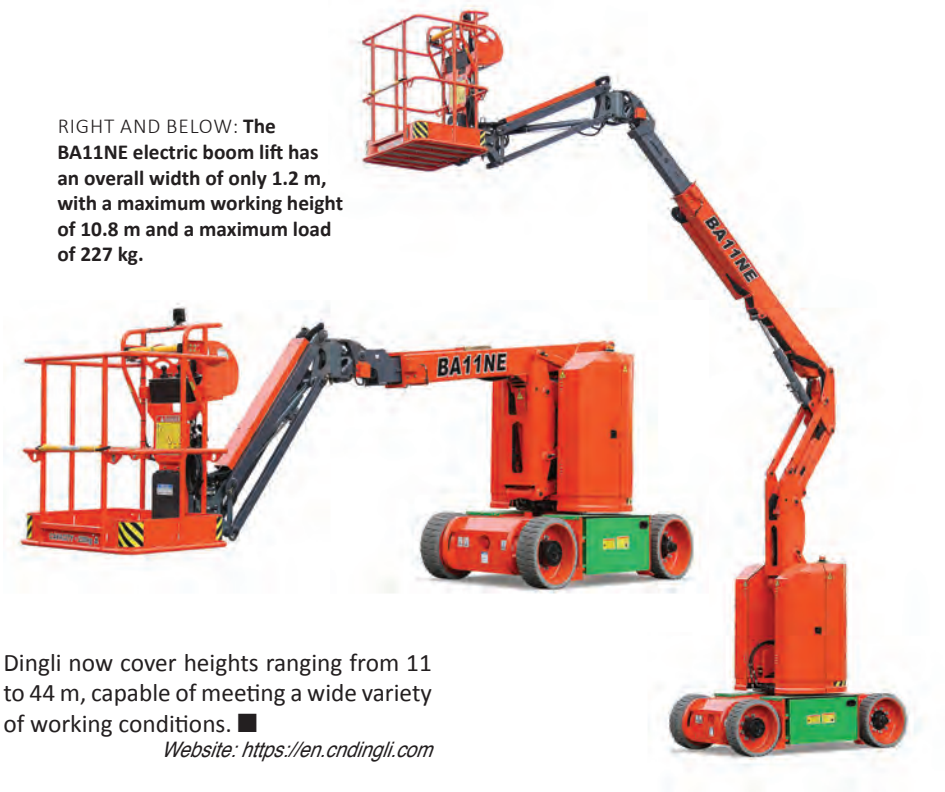
The BA11NE features a compact design, with an overall width of only 1.2 m and a stowed height of 2 m for easy manoeuvrability. This electric boom lift delivers zero emissions and a low noise level.

According to Dingli, the BA11NE is the smallest electric boom of its kind in the industry. It is suitable for applications such as indoor venues, warehousing logistics, shopping malls, and more.

In addition, the BA11NE has 4x2 drive, a maximum up and over height of 3.8 m, and a maximum horizontal outreach of 6.35 m. Dingli said the machine was developed based on the AMWP11.5-8100 vertical mast lift.

The electric articulated boom lifts from Dingli now cover heights ranging from 11 to 44 m, capable of meeting a wide variety of working conditions. ■

Website: https://en.cndingli.com



RIGHT AND BELOW: **The BA11NE electric boom lift has an overall width of only 1.2 m, with a maximum working height of 10.8 m and a maximum load of 227 kg.**

Yanmar's next-gen electric work machine prototype

Yanmar has unveiled a prototype of an electric work machine with advanced force control at the Construction DX Challenge 2023, organised by the Japanese Ministry of Land, Infrastructure, Transport, and Tourism.

Developed in collaboration with the Japan Aerospace Exploration Agency's (JAXA) Space Exploration Innovation Hub Centre, the large SEA (Series Elastic Actuator) was part of a prototype for the next-generation work machine under the Moonshot Research and Development Programme.

Yanmar has implemented force control capabilities, a challenge for conventional hydraulic systems. Using the SEA composed of an electric motor, reducer, and spring, the functionality was implemented in an electric mini excavator.

This technology aims to automate fine manual tasks, addressing labour shortages at construction sites. Moving forward, the company plans to conduct further verification to realise the practical applications of next-generation work machines in construction sites and similar environments.

Aligned with the Yanmar Green Challenge 2050, the company continues its commitment to achieving a sustainable society, contributing to customers' decarbonisation efforts through ongoing developments in electrification and other forward-looking technologies.

For this electric work machine prototype, the large SEA is mounted on a Yanmar ViO25 mini excavator in the 3-t class. Its rate load during lifting is 209 kg. ■

Website: www.yanmar.com

Yanmar's next-gen work machine prototype with force control technology, featuring zero emissions.

New RB 65 mobile drilling rig from Bauer

Bauer recently presented its latest generation of RB 65 mobile drilling rig. This new machine features an electrical pilot control for a more economical and safer operation based on automation processes.

Depending on the geology as well as the size and weight of the drilling tool, the RB 65 can be used for small calibre drilling up to a depth of 1,550 m and large calibre diameters of 1,200 mm up to a final depth of roughly 400 m.

Bauer's mobile drilling rigs in the RB series are suitable for a wide range of applications. They offer the optimal technical prerequisites, for example, to develop low-lying drinking water sources, make geothermal energy usable, explore raw material deposits or for dewatering well drilling in mining operations.

The major advantage of the RB rigs is that, with minimal retrofitting, the same equipment can be used to implement various methods, such as direct flush, mud rotary reverse circulation airlift, hammer drilling or cable core drilling.

The current RB product series from Bauer comprises the trailer-based rigs RB-T 100 and RB-T 135 (maximum hook load of 142 t) along with the two truck-based rigs RB 50 and RB 65 (maximum hook load of 70 t).

The on-board hydraulic system of the RB 50 and RB 65 is powered via the truck's auxiliary drive, and the two rigs feature a hybrid feed system using cylinder and hoist. External components such as compressors or flushing pumps are integrated into the drilling system of the rigs.

Equipped with the Restricted Operating Mode (ROM), protective cage, safety control and other features, both the RB 50 and RB 65 also fulfil all requirements pursuant to CE/DIN EN 16228. ■

Website: www.bauer.de

ABOVE: **The new Bauer RB 65 mobile drilling rig features an electrical pilot control for a more economical and safer operation based on automation processes.**

BOTTOM LEFT: **Depending on the geology as well as the size and weight of the drilling tool, the RB 65 can be used for small calibre drilling up to a depth of 1,550 m and large calibre diameters of 1,200 mm up to a final depth of roughly 400 m.**

All images: Bauer Group

New Wirtgen WRC 240(i) rock crusher for road projects

The new Wirtgen WRC 240(i) rock crusher breaks coarse rocks in-situ, as found in hand-packed pavement layers (e.g. Telford bases) or stony soils, and produces a homogeneous mix in a continuous process. The machine features a working width of 2,320 mm and a working depth of up to 510 mm, delivering an output of up to 600 t/hr.

The WRC 240(i) expands Wirtgen's portfolio of wheeled soil stabilisers designed especially for the processing of stony ground. In addition to the crushing of rocks and stones with an edge length of up to 300 mm and a compressive strength of up to 200 MPa, the machine can add cement and water in the same pass, for instance in the preparation of base layers. Here, the cement is pre-spread with a binding agent spreader and the water required is sprayed into the mixing chamber of the rock crusher via the machine's Varioinjection bar.

The WRC 240(i) can also be used for soil stabilisation. For this application, the pre-spread binding agents such as lime or cement are mixed into the existing soil with insufficient bearing capacity, then it is transformed in-situ into a high-grade construction material and deposited evenly behind the machine. The main task of the WRC is the granulation and mixing of a variety of soils, courses and layers to produce a homogeneous final product in a continuous process. As opposed to the removal and replacement of material, the processes here are characterised by shorter construction times, conservation of resources and lower CO2 emissions.

The rugged and resilient crushing and mixing rotor with toolholders developed especially for crushing applications with the HT18 provides optimal results when working in stony ground. The tools are fitted with large, impact-resistant carbide cutting edges and the holder bases are protected by wear-resistant protective elements made from high-tensile steel. This ensures high machine utilisation rates and process reliability in demanding applications. The rotor is driven via a transmission developed especially for the WRC that enables the realisation of high rotor speeds.

In order to ensure long-term resistance to the enormous stresses encountered when crushing rocks, the rotor housing of the WRC 240(i) is lined with abrasion-resistant wearing plates made from extremely tough high-tensile steel. This guarantees a longer service life and increases the overall stability of the housing. The entire mixing chamber is also lined with these hard-wearing plates, which can be individually replaced if and when required.

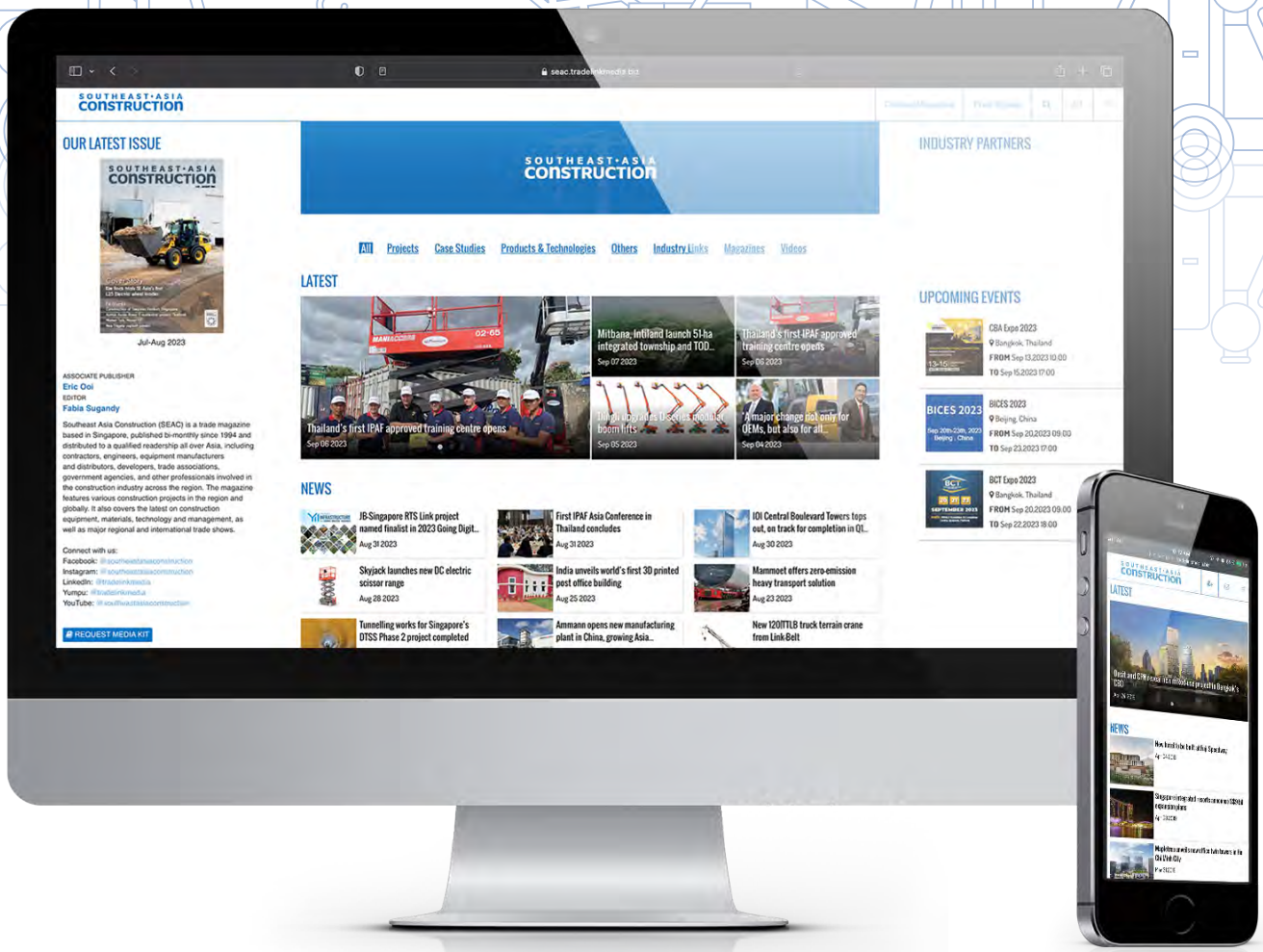
The Wirtgen WRC 240(i) rock crusher features a working width of 2,320 mm and a working depth of up to 510 mm, delivering an output of up to 600 t/hr.

The vertically-stacked, hydraulically-adjustable classifying screens of the WRC 240(i) ensure that only material that has reached the desired grain size is output from the crushing process in the rotor housing.

Furthermore, the WRC 240(i) offers several setting options that enable the achievement of the desired grain size and consistently uniform distribution in a wide range of applications. Nine rotor speeds, a variable crushing stage, exchangeable screens with a range of clear mesh sizes and adjustable distance from the rotor, adjustable rotor plate pressure and the machine advance rate enable the configuration of the machine to meet the needs of actual site conditions and the desired application.

With precise, automatic steering, the satellite-based AutoTrac system helps the WRC to achieve greater process efficiency and in turn a high degree of environmental compatibility. It steers the machine accurately within tolerances of a few centimetres on the basis of a previously calculated reference strip and a specified overlap of adjacent strips, resulting in consistent utilisation of the machine's ideal working width. The Wirtgen Performance Tracker (WPT) registers all relevant location-specific working parameters to provide a comprehensive database for the analysis and documentation of the construction site. ■

Website: www.wirtgen-group.com



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Bauer India builds deepest diaphragm wall element for Patna Metro project

Construction is currently underway on the Patna Metro subway project, located in the state of Bihar in northeastern India. Apart from subway lines and stations, the project also includes elevated railway routes along with train depots and the associated infrastructure.

Bauer Engineering India Pvt Ltd was awarded the contract for diaphragm wall work at four stations as well as for a retrieval shaft. "We are excited to contribute to this groundbreaking project. Our diaphragm wall elements act as solid and permanent foundations on which the new subway stations will be constructed," said Yogeshwaran Purushothaman, project manager at Bauer India.

The work started in November 2022 and is expected to be completed by March 2024. Over this period, a total of 636 diaphragm wall/barrette elements will be constructed for all four stations. As an impermeable/structural retaining structure, they provide stability and structural support. Among other equipment, a Bauer GB 34 hydraulic grab, a Bauer GB 50 and a DHG grab on a Bauer MC 96 duty-cycle crane are being used.

In June 2023, Bauer India set a record on this project as the team achieved the deepest barrette foundation element ever constructed at Patna Metro. It was installed at a depth of 75 m using a hydraulic grab. "This is a milestone in the history of Bauer India," said Mr Purushothaman. The remaining diaphragm wall elements will be installed up to a depth of 55 m.

The Bauer India team has faced a range of challenges in the process. For instance, the different geological soil profiles across the four sites and retaining verticality during work require the utmost attention.

Furthermore, all work has to be executed under very limited spatial conditions within the city. "This project is an absolute highlight for the entire team," remarked Mr Purushothaman. "We are unbelievably proud and motivated to master all the challenges involved." ■

Website: www.bauer.de

All images: Bauer Group

LEFT: **Construction is currently underway on the Patna Metro subway project, located in the state of Bihar in northeastern India. Here, Bauer carries out diaphragm wall work for four stations as well as for a retrieval shaft.**

ABOVE: **In June 2023, Bauer India set a record on this project as the team achieved the deepest barrette foundation element ever constructed at Patna Metro. It was installed at a depth of 75 m using a hydraulic grab.**

First Volvo CE electric machines in Japan get to work

Following the launch of Volvo Construction Equipment's (Volvo CE) electric machines in Japan recently, the first units are now at work. Among them is an ECR25 Electric compact excavator being used on a residential development in Osaka.

At the CSPI-Expo in Tokyo held in May 2023, Volvo CE unveiled two electric machines for the Japanese market. Just a few months later, the first units are already at work, delivering emissions-free performance on local jobsites.

One of the first projects in the country to take advantage of these electric machines is a new condominium construction underway in Osaka. The main contractor on the project is using an ECR25 Electric excavator rented from Nishio Holdings. The company was the first in the country to receive electric machines from Volvo CE and purchased them from local dealer Yamazaki Machinery, which is providing full sales and service support.

A representative from the contractor working on the Osaka project said, "We've already received significant positive feedback on the ECR25 from our operators at the construction site who love the reduced noise in their working enclosure and find the performance almost identical to diesel machines.

"It's a stylish and modern-looking machine that is perfect for urban areas. In addition, as the electric machines are CO2 free, we are proud to be able to proactively contribute to reducing our carbon footprint in line with the Japanese government's plans."

The ECR25 Electric compact excavator is a 2.6-2.8 t capacity machine with a 22.3 kN breakout force. It has an onboard charger for general charging, an external quick charger (optional for indoor/outdoor specifications), and a 20-kWh battery array, allowing for three to four hours of work per charge.

"There is huge interest from customers in Japan for emissions-free, electric construction machines. We're discussing multiple projects and applications and expect more machines to arrive in 2024. Our company is committed to reaching net-zero emissions by 2040 as part of our commitment to Science Based Targets," said Shoji Isamu, head of market Japan at Volvo CE.

"In addition, the Japanese government is aiming to reduce carbon emissions by 60% by 2035. We believe that switching to zero-emissions machines can help many industries support the wider, national goals of Japan." ■

The Volvo ECR25 Electric compact excavator working on a residential project in Osaka. This 2.6-2.8 t capacity machine has an onboard charger for general charging, an external quick charger (optional for indoor/outdoor specifications), and a 20-kWh battery array, allowing for three to four hours of work per charge.

A Nishio Holdings operator using the ECR25 excavator. The company was the first in Japan to receive electric machines from Volvo CE and purchased them from local dealer Yamazaki Machinery, which is providing full sales and service support.

Website: www.volvoce.com/asia

BUILDING INFRASTRUCTURE AROUND THE WORLD THE LINTEC & LINNHOFF WAY

A LEADING PLAYER IN THE ASPHALT AND CONCRETE BATCHING PLANT SECTORS, LINTEC & LINNHOFF HAS BEEN INVOLVED IN KEY INFRASTRUCTURE PROJECTS AROUND THE WORLD. ***SOUTHEAST ASIA CONSTRUCTION (SEAC) TALKS TO TEE PEOW AIK, GROUP CHIEF OPERATING OFFICER AT LINTEC & LINNHOFF,*** ABOUT OPPORTUNITIES AND CHALLENGES IN THE ASIAN MARKET, DIGITALISATION AND ITS IMPACT ON THE GROUP'S OPERATION, AND WHAT'S IN STORE FOR THE FUTURE.

1 Mr Tee, Lintec & Linnhoff is active globally. Can you tell us more about the group's presence in Asia, and the challenges faced in this market?

Tee Peow Aik (TPA): Asia is one of our biggest markets and certainly one where we've established our strongest presence. Challenges and opportunities vary across the region. We take a granular approach – not only to working with individual countries, but with individual customers in those countries. If you focus a business around its customers, then it directs a lot of what happens on a day-to-day basis.

Given that Lintec & Linnhoff is headquartered in Singapore, there are multiple benefits that help us address challenges across the region. Singapore's strategic location at the heart of Southeast Asia makes it a global hub for businesses looking to access markets across Asia. In addition, Singapore boasts excellent infrastructure including world-class ports and airports, ensuring efficient logistics and supply chains, coupled with strong government support and a skilled labour force.

Lintec & Linnhoff is backed by our strong German heritage, which dates back over 100 years. It also has a strong presence in Asia since 1986, including manufacturing facilities in Malaysia and China for supply to local and regional markets.

Having said that, within each country, there are specific aspects of business including regulatory or environmental, supply chain or logistics. We rely on our close-knit team and network of well-established dealers to stay ahead of what's going on. It's all about staying on top of market changes, building strong partnerships and being flexible.

The outlook for Asia over the medium term is positive. We expect ongoing investment in infrastructure including our newly launched manufacturing plant in Johor, Malaysia, which is near strategically important and cost-efficient shipping lanes. We remain upbeat about Asia's future and are fully focused on remaining a leading supplier for the region.

LEFT: **Mr Tee shares Lintec & Linnhoff's growth ambition globally as the group plans to extend its presence in Asia, Latin America, Africa and the Middle East.**

BELOW: **Lintec & Linnhoff offers highly flexible solutions to meet different customer needs. One of the examples is this Linnhoff asphalt batching plant, which has been customised for a contractor in the Philippines.**

❷ Speaking of the new factory in Johor, this is a major investment for the group. Can you share the progress so far?

TPA: Phase one covering 88,888 sq ft was launched in December 2022. The plan was to start two additional expansions at the facility to meet our growth ambitions. Phase two, with an extra 76,850 sq ft is in progress and almost 80% complete and we expect this to be done by early 2024. This will enable us to develop and manufacture Lintec containerised asphalt and concrete plants at the facility.

The third phase of expansion work at the facility will begin shortly after that. This will see an increase in the size of the open-yard area for storage and create more space for rigorous testing and assembly of plants before delivery to customers.

We have an exciting, long-term vision for our facility in Johor and additional investment will also be made for new equipment to support production capacity and efficiency. Once complete, there is scope for the planned development of the Johor facility to cover more than 282,000 sq ft.

Lintec ECP Eco is a new generation of concrete batching plant, which is eco-friendly and capable of producing high-quality concrete in large quantities.

❸ Digitalisation has significantly transformed the way businesses operate. How does it impact Lintec & Linnhoff, particularly in Asia?

TPA: Digitalisation, one of the most exciting areas of growth and development for the construction segment, has been an essential feature of our plants for many years. We use the Microsoft platform for the operating system within our plants, making it a simple 'plug and play' step for customers to integrate the plant into their IT infrastructure.

We've also had automation in our operations for many years. Of course, the acceleration we're seeing in other industries will continue to impact the concrete and asphalt segments, including our brands.

Overall, I'd say there are several areas where we expect digitalisation to have a stronger impact on our business and our customers. These are:

- Process optimisation: Digitalisation allows for real-time monitoring and control of plant operations.
- Remote monitoring: It's possible to monitor, adjust and troubleshoot operations from the office, allowing contractors to manage multiple plants and projects at once. This is beneficial in Asia, where large construction projects are often located in remote areas, making it challenging to have personnel on-site at all times.
- Environmental impact: We can help project managers focus their attention on the sustainability and environmental

ABOVE LEFT, ABOVE,FAR LEFT AND LEFT: **Lintec & Linnhoff's manufacturing facility in Johor, Malaysia, is currently undergoing the second phase of expansion. When completed, it will produce Lintec containerised asphalt and concrete plants.**

performance of their jobsites, by providing real-time data. Digitalisation can help us monitor emissions and promote the use of recycled materials in asphalt and concrete production.

• Quality control: Similarly, digital technologies can enable better quality control through continuous monitoring of material proportions and mixing processes. This results in higher-quality products, which is vital for the durability of infrastructure in Asia's diverse climate conditions.

• Customer experience: Digital platforms enable better communication with customers. Clients can track the progress of their projects and receive real-time updates, enhancing transparency and satisfaction.

A Lintec asphalt plant in operation in China. This unit is fitted with a hot recycling system that delivers a number of environmental benefits, and also features the containerised concept for easy transportation.

4 As you mentioned, digital technologies boost operational efficiency, improve product quality, and also encourage sustainable practices in the use of Lintec & Linnhoff plants. Besides these benefits, what are the other features of the plants that make them stand out?

TPA: Our Lintec and Linnhoff product lines have built their reputations on a combination of innovative design and reliable, productive performance.

We're unique in offering the perfect balance between industry-leading German engineering design and localised manufacturing and service. We harness our global design talent and use that to produce the plants in Asia and Latin America.

In terms of design, our flagship Lintec asphalt and concrete plants boast the

With digital technologies, users of Lintec & Linnhoff plants can monitor, adjust and troubleshoot operations remotely, allowing them to manage multiple plants and projects at once.

containerised concept, where we prebuild components of the plants into 100% ISO certified sea containers. This simplifies transportation, and delivers time- and cost-savings on the jobsite with a plug-and-play system. Each container also features a flat rigid surface area which ensures stability on suitably compacted soil, removing the need for concrete foundation and allowing a lower total cost of ownership. Similarly, the ease of assembling and disassembling a Lintec or Linnhoff plant is another feature that is regularly appreciated by our customers.

In terms of customer support, our business structure is designed to be highly adaptable, so we offer clients the solutions they need. We take a three-pronged approach that looks at project requirements, business goals and budget. No matter what the variables are, we always have a solution that's right. We don't expect customers to fit in with what we offer, but instead, we finetune our proposals to fit customer needs.

5 With such specialised equipment, does Lintec & Linnhoff provide any training to enhance the skills of the plant operators and technicians?

TPA: At Lintec & Linnhoff, we offer complete training and support at any time during a plant's lifecycle. As technology progresses, new techniques and ways of working can help clients get more from their plants. Training is important because operating and maintaining such specialised equipment requires expertise and knowledge. Some aspects we focus are:

• Plant operation: Teaching operators how to effectively run and manage the plant, understanding the control systems, material handling, production processes and more.

• Maintenance and troubleshooting: Providing training on equipment maintenance, preventive maintenance and troubleshooting. This includes identifying common issues to minimise downtime and ensure optimal performance.

• Safety: Ensuring that operators and technicians are well-versed in safety protocols and best practices to prevent accidents and ensure a safe working environment.

• Environmental compliance: Training on how to operate the equipment in an environmentally responsible manner, including compliance with emissions and pollution control regulations.

• Upgrades and technology: Updating operators and technicians on the latest technological advancements and upgrades available for Lintec & Linnhoff equipment.

TOP, ABOVE AND BELOW: **Lintec & Linnhoff provides complete training and support at any time during a plant's lifecycle. As technology progresses, new techniques and ways of working can help customers get more from their plants.**

6 Lintec & Linnhoff recently announced the consolidation of the Eurotec brand into the Lintec brand. So, can we expect to see more investments and new innovations happening in the near future?

TPA: Lintec & Linnhoff has big plans to globalise in the coming years. For Asia, we want to grow our leading position by extending our presence in more countries. The same goes for Latin America, where we're also strong, and we want to expand our presence there. There are exciting opportunities for us in the Middle East and Africa, and recent years have proved fruitful in both those markets thanks to our continuous investment in our team and dealer network.

In terms of product, you can expect to see further advances in the sustainable performance of our plants and technology. We've already set solid foundations in both these areas of machine performance, and we expect that to continue. ■

Website: www.lintec-linnhoff.com


SAFETY IS THE MEASURE OF OUR SUCCESS

SINGAPORE DEEP TUNNEL

Surbana Jurong takes on DTSS2 project

Singapore's Deep Tunnel Sewerage System Phase 2 (DTSS2) recently marked a new milestone with the completion of its tunnelling works. In this project, Surbana Jurong provided comprehensive engineering services for various aspects of the contract T-11, including deep underground tunnel design, shaft design, ground improvement, hydraulic design, initial and final support, instrumentation and monitoring all the way to aboveground structures. The team was also involved in the operation of a vertical shaft sinking machine (VSM).

The DTSS2 T-11 consisted of 11,500-m-long tunnels with diameters of 3.0 and 3.3 m, as well as 15 shafts and five slurry tunnel boring machines (TBMs). The scope of works for this section included, among others:

1). South Tunnel, its shafts and other features, starting from Shaft Ki located at Keppel Road/Anson Road junction, along Ayer Rajah Expressway (AYE), to Shaft M at Portsdown Avenue/AYE (Shaft Ki to Shaft M). The total length of the South Tunnel is 6 km.

2). Southern Region Link Sewer Tunnel with a total length of 5.5 km, its nine shafts and other features, with the first Shaft L-LS8 located at Sentosa Island to Shaft LW at Warwick Road/Alexandra Road junction (Shaft L-LS8 to Shaft LW).

OPPOSITE, ABOVE AND ABOVE RIGHT: **Tunnelling works for Singapore's DTSS2 project were recently concluded. Here, Surbana Jurong provided comprehensive engineering services for various aspects of the contract T-11.**

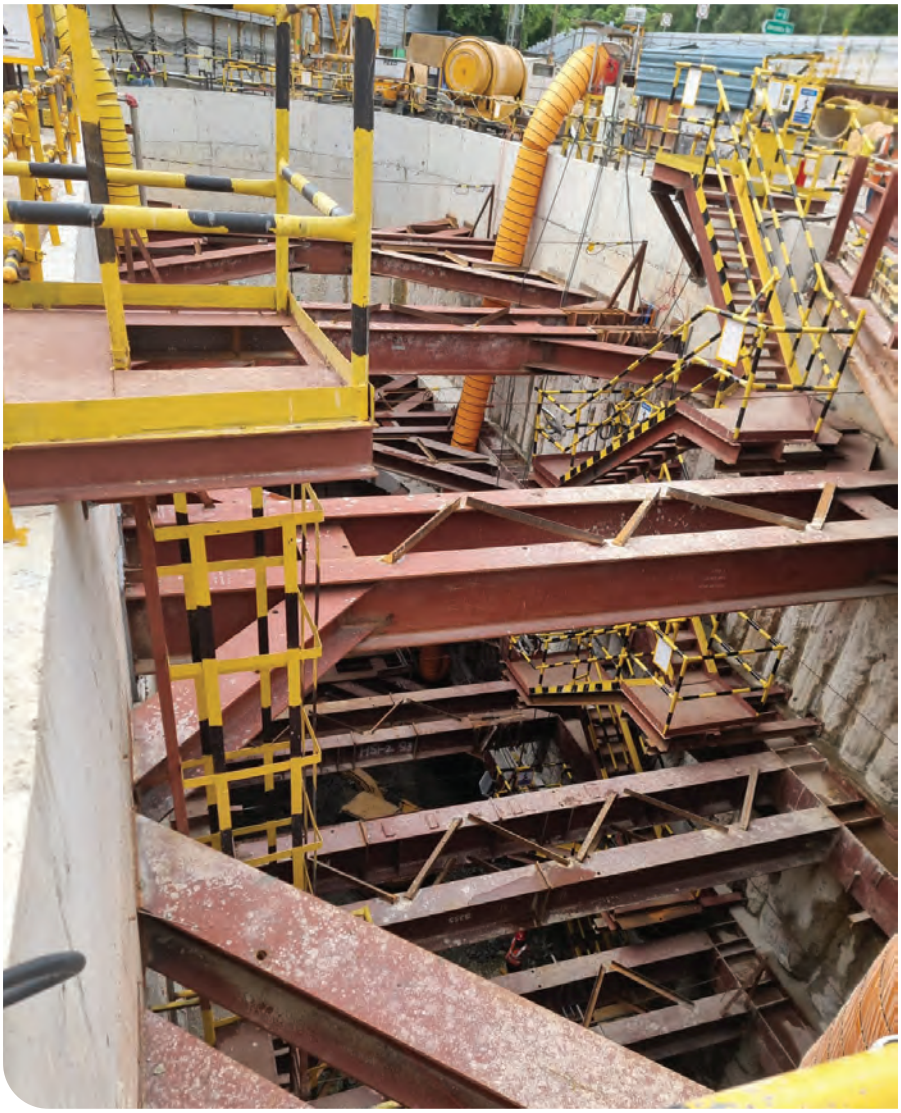
ABOVE AND LEFT: **The vertical shaft sinking machine (VSM) technology was used in the DTSS2 T-11 section, allowing safe and quick shaft construction in difficult ground conditions below groundwater table.**

Shaft excavation with VSM technology

The VSM technology was adopted in the DTSS2 T-11 section, which was the first in Asia for circular shaft construction, revealed Surbana Jurong. It increases the efficiency of excavation in difficult ground conditions.

"It is the inverted form of the conventional, partial face excavation on machines used in horizontal tunnel boring, i.e. from horizontal to vertical," explained Surbana Jurong. Here, the shaft boring machine operates under water/slurry at a maximum depth of 85 m. All the machine components, such as the hydraulic systems, electrical systems, sealing and lubrication systems, have also been designed to withstand the water pressure at such depth.

According to Surbana Jurong, the VSM technology allows safe and quick shaft construction in difficult ground conditions below groundwater table. This method is suitable for hard rock with an UCS of up to 140 MPa and a hydrostatic pressure of up to 10.2 bar.



Another benefit of the VSM technology is that it enables simultaneous excavation and construction of caisson lining. Plus, the shaft construction can be carried out within a very limited space in densely populated areas, without impacting the existing development or causing severe ground settlements.

Surbana Jurong further highlighted that the DTSS2 tunnels use microbiological-influenced corrosion (MIC) resistant concrete and high density polyethylene (HDPE) lining to protect against corrosion, particularly from bacteria and other microorganisms and also from gaseous fumes in the sewer environment. This sustainability and resilience-driven initiative forms part of the corrosion protection system to ensure the structure is highly durable and will be able to meet the design life of 100 years. ■

Website: www.surbanajurong.com

TOP AND LEFT: **By applying the VSM technology, the shaft construction can be carried out within a very limited space in densely populated areas.**

All images: Surbana Jurong

TEAMWORX GOES DIGITAL TO BOOST PRODUCTIVITY

Since 2003, TeamworX has been providing engineering, procurement and construction management (EPCM) services for clients across Indonesia. As its business grew, the company needed to manage a never-ending paper trail for each project. It also had to factor in the growing administrative responsibility for regulation, compliance and accreditation requirements on each construction project.

The TeamworX project teams used a mix of spreadsheets, forms and online documents on daily project tasks. With so much project management data from various sources, it took time to collate information and stay up-to-date with variations, making it very difficult to organise schedules and budgets.

The need for greater transparency and control over the communication of variations led TeamworX to implement a digital construction management platform, facilitating the company's digital transformation process.

Indonesia-based TeamworX has implemented a digital construction management platform, facilitating the company's digital transformation process.

Replacing paper trail

TeamworX has selected Procore as its partner, employing the platform to capture real-time transparent construction data to share it with construction teams, TeamworX executives and building owners. The result is that onsite document managers no longer have to collate information from different sources and so they can be redeployed to higher-value tasks.

Procore's Project Management and Quality & Safety software solutions are used to efficiently capture, manage and access the information needed for clients operating a portfolio in highly regulated industries.

Over 150 staff from TeamworX have been trained to input digital information for RFIs, documents, inspections and photos into the Procore platform to replace paperwork and transform how the company builds. There are no more manual follow-ups and time-consuming physical site inspections.

TeamworX uses the Procore platform to capture real-time transparent construction data to share it with construction teams, TeamworX executives and building owners.

The site team members previously responsible for chasing outstanding documents and conducting physical site walks have been redeployed to focus on project workflow and resolve outstanding items as quickly as possible.

"Previously, we have had to assign a document controller on each site to manage the manual documentation and systems we have had in place. Integrating Procore is the only way to track and analyse real-time changes to our budgets,

FAR LEFT: **Marangkup Manik, director and head of construction and project management at TeamworX.**

LEFT: **Hendy Alvianto, construction manager at TeamworX.**

BELOW: **Over 150 staff from TeamworX have been trained to input digital information for RFIs, documents, inspections and photos into the Procore platform to replace paperwork and transform how the company builds.**

schedules and projects," said Marangkup Manik, director and head of construction and project management at TeamworX.

Creating digital culture

Since implementing Procore in December 2021, TeamworX has established a digital culture among its team members, clients and contracting staff. The company plans to extend its Procore footprint, adding pre-construction and tender management shortly to its processes.

"The vision for TeamworX is to onboard our entire contracting workforce to the Procore platform and share the benefits of digital construction management. Over 70% of our contractors love the change immediately and quickly understand how Procore will help them build. Our goal is to mandate the use of Procore across all of our projects by the end of the year," said Mr Manik.

Creating a digital culture has already paid off for TeamworX as its recent surveillance audit for ISO 9001 and other standards was a success. "With centralised data and documentation, our auditor commented on how much Procore supported a more streamlined and professional auditing process," said Hendy Alvianto, construction manager at TeamworX.

According to Procore, because many of its staff come from the construction sector, they can communicate easily with TeamworX to explain, for example, the need to use software to manage the administration of concrete pours and steel construction schematics. The Procore platform has been rolled out across TeamworX's new projects and all of its construction sites.

"There is no way you can implement Procore to digitise your construction management and then consider going back to manual ways," said Mr Manik. "We are starting our new journey into hospital consultancy services using the Procore platform for our communications. Procore is the right location for sensitive data and client accreditation details as our complex project progresses. It's so easy to use Procore we look forward to building it into our future." ■

Website: www.procore.com/en-sg

TeamworX plans to extend its Procore footprint, adding pre-construction and tender management shortly to its processes.

All images: TeamworX

GO GREEN, GO DIGITAL

The recent Liebherr trade press tour was held on 6-7 November 2023 in Ulm and Bad Schussenried, Germany, showcasing a number of low- and zero-emission machines and equipment as well as various digital solutions offered by the group. Southeast Asia Construction (SEAC) joined the event to take a closer look at these innovations.

ECO-FRIENDLY MACHINES

Electric excavator and wheel loader

Liebherr's first battery-powered wheeled excavator and wheel loader are the A 916 E and L 507 E respectively. Both models deliver zero emissions onsite and a low-noise level, making them ideal for use in inner-city areas and for indoor applications. The performance of these electric machines matches that of their conventional diesel counterparts.

According to Liebherr, the A 916 E wheeled excavator has been available in selected European countries for a few months now, while the L 507 E wheel loader has been offered by the group's sales partners in several European countries since October 2023.

A 916 E electric wheeled excavator

The A 916 E is equipped with a 260 kWh battery unit divided into four sections. On the left of the uppercarriage there is a battery with a 130 kWh capacity, while three batteries connected in series with a total output of a further 130 kWh are installed on the right-hand side of the uppercarriage. Depending on the location and application, this electric wheeled excavator can be operated for up to nine hours at a time.

The A 916 E can be charged with both alternating current (AC) and direct current (DC) and has two integrated chargers with a total of 44 kWh. Depending on the power supply, the machine can be charged in around six hours at 400 V and 63 A, for example. A fast charger with a maximum of 120 kW (DC) is also offered as an option.

Liebherr said the electric drive concept for the A 916 E was implemented via a close partnership between the group, its Dutch

Liebherr's low- and zero-emission product offerings being showcased to the global construction trade media in Bad Schussenried.

ABOVE RIGHT: **The A 916 E battery-electric wheeled excavator.**

ABOVE: **The L 507 E battery-electric wheel loader.**

LEFT: **With extensive use of glass in its operator cab, the L 507 E provides good visibility of the work area.**

Liebherr's top executives at the press conference in Ulm, including (from left) Steffen Günther, Stephen Albrecht and Heinz Klemm.

sales partner Wynmalen & Hausmann, and a company specialising in the electrification of construction machinery.

Except for its electric drive concept, the A 916 E has been designed based on the Liebherr A 916 Litronic standard wheeled excavator. For example, the different undercarriage variants of the A 916 Litronic are available for the A 916 E. The undercarriage structures are robust and, in combination with the firmly welded supports, ensure a secure footing and thus maximum stability in every application. The support and dozer blade as well as the outriggers are also built for tough conditions.

The cab incorporates a folding arm console to provide extra safety for the operator when climbing in and out. Thanks to the large windows, the operator can have a good view of the work area at all times. Other features such as the windscreen wiper for the lower windscreen, generous storage options, an easy-to-clean floor mat and adjustable armrests offer even more comfort in the cab. Depending on the job, various equipment combinations, Liebherr attachment tools and Liebherr quick coupler systems are also available for the A 916 E.

L 507 E electric wheel loader

For the L 507 E, Liebherr has adopted a high-voltage battery system – specially developed for this electric wheel loader – to ensure a powerful performance and efficient charging. The machine has a 32.2 / 64.4 kWh battery capacity.

Depending on the conditions, the L 507 E offers a running time of up to eight hours. Liebherr's modular battery design also makes it possible to install a second lithium-ion battery to increase the running time. Depending on the on-board charging technology and power rating, the battery can be fully charged in about one and a half to three hours.

The L 507 E has a final speed of 20 km/hr. However, the wheel loader is also optionally available as a 'Speeder' and in this version reaches a speed of up to 30 km/hr, which enables the machine to move easily from one jobsite to another. For greater efficiency, the energy generated downhill and during braking is fed back into the battery through recuperation.

Designed based on the conventional Liebherr L 507 Stereo wheel loader, the new L 507 E also features stereo steering. This combination of articulated steering and steered rear axle offers the advantages of conventional articulated steering with those of all-wheel steering, resulting in a minimal turning circle and a reduced articulation angle of 30 degrees, and in turn increasing the stability of the wheel loader. Moreover, Liebherr has installed its articulated

The MK 88-4.1 mobile construction crane features a hybrid power concept.

The LTC 1050-3.1 mobile crane can be powered by an electric motor, in addition to its six-cylinder engine.

pendulum joint in the L 507 E, which compensates for uneven ground and ensures that the wheel loader has excellent stability.

The L 507 E uses the same lift arms as those of the L 507 Stereo. They are fitted with powerful z-bar kinematics, which also work safely in fork operation without manual readjustment. Here,

the new electro-hydraulic pilot control of the L 507 E enables highly responsive and precise movements on the lift arms. The fully automatic Likufix quick-coupler system is also available, allowing the operator to change between mechanical and hydraulic attachment tools from the cab quickly at the touch of a button.

The extensive use of glass in the operator cab provides good visibility of the work area. Various setting options as well as operation-relevant data, such as the charge status of the battery, can be found on the height-adjustable display with a touch function. In addition, the operator has the option of adjusting the steering wheel and seat individually as desired.

Mobile cranes with hybrid power

MK 88-4.1 mobile construction crane

Designed for global markets, the MK 88-4.1 mobile construction crane is suitable for use in densely populated city centres, on night construction sites and in residential areas. The crane can be unfolded and positioned close to buildings and requires only minimal floor space.

With a lifting capacity of up to 2.2 t at a maximum radius of 45 m, the four-axle MK 88-4.1 offers high flexibility in a wide range of construction projects. The crane has the capacity to lift up to 8 t.

The MK 88-4.1 can be operated in electric mode using site electricity instead of its diesel engine, delivering zero emissions locally and a low noise level. According to Liebherr, using site power makes crane operation significantly more cost-efficient. Over a year, this results in only 10% of the operating costs associated with use of a diesel engine.

If there is insufficient or no on-site power available, Liebherr's mobile battery-based energy storage system Liduro Power Port (LPO) is able to take over supply, so that hybrid or all-electric construction machines can be operated and charged locally with zero emissions. A diesel-powered generator is also available as an option.

The alternative fuel HVO (hydrotreated vegetable oil) can be used for the engine in its pure form or mixed with diesel to any required ratio. Liebherr said fuel for its machines comes from food industry waste, without using palm oil. By reducing exhaust gases, HVO helps to limit global greenhouse gas emissions. The fuel is fully compatible with all engine components.

LTC 1050-3.1 mobile crane

The 50-t LTC 1050-3.1 mobile crane is available with an electric motor (72 kW), in addition to its six-cylinder engine. Depending on the job conditions, either the engine or the electric motor can be selected in crane mode.

The electric motor reduces both air and noise emissions to a minimum, making the LTC 1050-3.1 suitable for use in noise-sensitive and zero-emission areas. The engine can be fuelled with HVO without restrictions, helping to reduce its CO2 emissions by up to 90% compared to fuelling it with diesel.

Liebherr revealed that only the electric motor and a distributor gear as well as the required control equipment need to be added to the existing LTC 1050-3.1 to transform it into an electric version. Such a simple solution enables the operator to switch flexibly between diesel-hydraulic power and electro-hydraulic power.

The electric motor uses the existing hydraulic pump, which is mounted on the powershift transmission. The distributor gear is located between the crane pump and the powershift transmission.

Site current at 125 A is required to achieve full performance, but the LTC 1050-3.1 also works well with a 63 A supply, said Liebherr. Alternatively, the crane can be operated using an external battery pack if the site does not have the appropriate electrical infrastructure.

TOP: **The new Betomix and Mobilmix concrete mixing plant series has a lower carbon footprint during operation.**

ABOVE: **An ETM concrete truck mixer with electric drum drive.**

The Liebherr-Mischtechnik factory in Bad Schussenried manufactures concrete truck mixers, concrete pumps and concrete mixing plants.

Other features for the electric version of the LTC 1050-3.1 include a 36-m Telematik telescopic boom, RemoteDrive option for remote-controlled driving, and height-adjustable elevating cab. This crane is available for global markets.

Lower-emission concrete plants and truck mixers

Betomix and Mobilmix concrete plants

The new Betomix and Mobilmix concrete mixing plant series can be built entirely using a modular system. Customers benefit from a greater range of configuration options, shorter lead times, faster assembly and high parts availability. In addition, these plants are more environment-friendly.

According to Liebherr, the new generation of plants requires up to 30% less energy than the previous versions, and the necessary electricity supply can also be reduced. This is achieved by frequency converters for the drives on the mixer and skip; power peaks can be avoided. Wear on mechanical parts is considerably reduced due to smooth starting and stopping processes for the drives.

Furthermore, thanks to the frequency converter, the speed of the twin-shaft mixer can be changed during the mixing process and adapted to the recipe. The lower energy requirement over the entire service life of the mixing plant constitutes an enormous contribution to environmental protection.

The biggest factor in improving environmental protection is the cement, revealed Liebherr. The frequency converters enable an accuracy of +/- 0.5% when metering cement. With a typical recipe featuring 300 kg of cement per cubic metre of concrete, up to 7.5 kg of cement can be saved. For example, with an annual output of 50,000 cu m of concrete, this corresponds to savings of 375 t of cement per year. Cement production has a global warming potential of 587 kg per tonne. According to this calculation, the new generation of mixing plants from Liebherr can save up to 220 t of CO2 per year.

ETM truck mixers

The ETM truck mixer series with electric drum drive allows concrete to be unloaded at the construction site with zero local emissions. Customers can choose from a number of different concepts: the hybrid version on a chassis with a conventional diesel drive, the fully electric version, or as a semitrailer with any tractor unit.

For the hybrid version, the ETM concrete truck mixers can be combined with a conventional diesel chassis. This means the journey to and from the jobsite is made with a diesel engine. On site, a battery-powered rotating drum is used for mixing, unloading and waiting periods. The battery is charged during the outward and return journey using a smart charging system.

On average delivery trips, it is not necessary to charge the vehicle at a charging station, said Liebherr. Compared to conventional concrete mixers, it is possible to reduce fuel consumption by up to 30% with the ETM series, thereby cutting CO2 emissions by 30% as well. Noise levels are also much lower.

When the ETM truck mixer series is mounted on a fully electric chassis, the electric drum drive is powered by the chassis traction battery. The semitrailer also has an electric drum drive, available again in hybrid or fully electric versions, depending on the tractor unit. A combination involving a gas tractor unit has also been realised.

LPO mobile energy storage system

The Liduro Power Port (LPO) is a battery-based, mobile energy storage system ideal for use on construction sites. It enables the operation and charging of hybrid or fully electric construction equipment with zero local emissions.

The Liduro Power Port (LPO) enables the operation and charging of hybrid or fully electric construction equipment with zero local emissions.

A Liebherr mobile construction crane with the LPO energy storage system.

Liebherr said that starting from 2024, the LPO will have power ranges of up to 160 kW/ kWh. It can be charged at up to 32 A and deliver power to loads via multiple connections that can be used simultaneously: 16 A / 32 A / 63 A / 125 A. The LPO can also be charged and discharged at the same time. The energy and condition monitoring is managed via the local control and, additionally, via a remotely available app for smartphones and tablets.

The LPO can supplement an insufficient grid connection or be deployed as an isolated grid when there is no grid connection on the jobsite. According to Liebherr, by using the LPO as a supplement to the grid connection, the dimensioning of the grid connection power can be significantly reduced, as the energy storage unit covers the load peaks of the machines.

What's more, the LPO can be transported easily with an optional trailer chassis or standard trailers. On site, if required, it can be moved by crane or excavator, using suspension points; and lifted and moved from all sides by a forklift. The basic dimensions of the LPO are 2,434 x 1,520 x 1,433 mm (L x W x H) or 3,903 x 2,031 x 1,899 mm with a trailer.

DIGITAL SOLUTIONS

Liebherr's digital solutions aim to achieve greater efficiency, safe and comfortable operation of machines and systems, as well as time and cost advantages for its customers.

Central user platforms

MyLiebherr

The central platform for digitalisation is MyLiebherr. All the digital services and offers are bundled together there and made available in an easy-to-understand manner for the respective user. The MyLiebherr portal works across all applications and plays a crucial role in every division of the Liebherr Group.

Tower Crane Portal 2.0

The central digital platform for the tower cranes division has undergone a comprehensive update and is fully integrated into MyLiebherr. The digital crane details have been redesigned and contain all the essential machine data at a glance. Sales information, operating instructions, technical information, data sheets or service forms are all centrally available, including via smartphone.

Planning

MyGuide for Earthmoving

With MyGuide for Earthmoving, Liebherr is launching a new app for earthmoving and material handling machinery specifically for customers and machine operators, as well as fans and anyone else interested in construction machines. This application bundles product information and news from both segments, so that users can access the relevant topics quickly and easily at any time.

Earthmoving Configurator

Inclusion of the Liebherr Earthmoving Configurators directly in the MyGuide for Earthmoving app enables improved operation and application. Users can easily create, save and manage the configuration of their chosen machine at any time via the app. Earthmoving Configurator includes a broad portfolio of machines, attachments, quick coupling systems and services from the areas of earthmoving and material handling machinery. This application is simple and intuitive, and guides the user step by step through the machine design and the available equipment versions and options.

Crane Planner 2.0

With the operation planner for mobile and crawler cranes under MyLiebherr, customers can easily plan crane operations, integrate them into the real environment via Google Maps or generate 3D representations. From this, planning reports (including visibility of all set-up codes, ground pressures, bottlenecks and the required footprints) can be created to show the end customer, without the need for CAD knowledge.

Crane Finder

Upon entering data on the load, required height and desired radius, the Crane Finder displays a range of suitable Liebherr mobile and crawler cranes for the task at hand – including possible configurations. The objective is to find the right crane for a given lifting task quickly and easily. The Crane Finder web application is available free of charge via the MyLiebherr customer portal and can be used on a variety of devices.

Operations and Maintenance

MyLiebherr Maintenance

This digital service enables customers to operate fleets of earthmoving and material handling technology with maximum reliability. Integrated into the MyLiebherr portal, MyLiebherr Maintenance supports plant managers in reducing unscheduled machine downtimes and the time required to identify, assess and resolve issues. For fast troubleshooting, plant managers can view, for example, the machine operator's MyAssistant damage reports in the service history.

Moreover, MyLiebherr Maintenance can be used to keep an eye on and plan for upcoming maintenance tasks, similar to the machine display. In this way, service activities can be bundled and adapted to operational requirements. Spare parts can easily be ordered in just a few clicks via the MyLiebherr spare parts shop.

MyLiebherr Performance

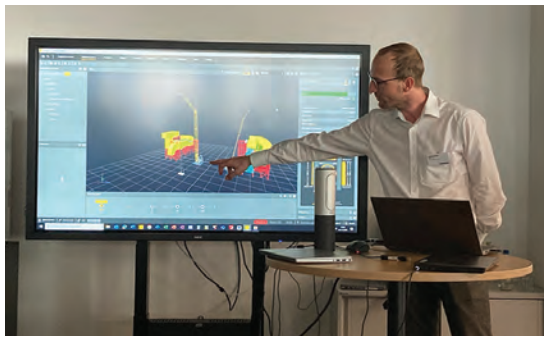
This digital service is also integrated into the MyLiebherr portal. MyLiebherr Performance enables customers to keep an eye on service data from earthmoving and material handling machines and attachment tools. This helps to identify inefficient machine operations, reduce downtimes, thereby saving fuel, and analyse weighing data. The utilisation overview gives operators a quick overview of how heavily the machines are being used.

An additional feature displays the fuel economy of individual machines and compares them to a global average. With the group comparison function, individual machine groups can be created according to the type of use or the machine category and compared in terms of working hours, downtime and consumption.

Attachment Assist and MiC 4.0 BUS

Liebherr's Attachment Assist enables smart attachment tool recognition. This solution detects the attachment and transmits its data to the machine. The machine then adjusts automatically to the attachment tool. The data transfer between the machine and the attachment tool is carried out via Bluetooth, so attachment tools can be detected regardless of the quick coupler or manufacturer. All the relevant operational data, like operating hours and coupling times, are recorded and made available online in MyLiebherr Maintenance and MyLiebherr Performance.

Attachment Assist ensures needs-based maintenance, as it reports service intervals and upcoming maintenance. This system



At Liebherr-Digital Development Centre in Ulm, the media gets insights into various digital solutions offered by the Liebherr Group.

The MyLiebherr portal works across all applications and plays a crucial role in every division of the Liebherr Group.

uses the new, manufacturer-independent communication standard MiC 4.0 BUS. This makes for significantly easier integration of different attachment tools both with Liebherr machines and with those of other manufacturers.

Digital Mobile Crane Operator

Liebherr offers an eLearning course for digital mobile crane operation, which is carried out online independently and at flexible times. Over 18 units of around 60 minutes each, users are taught the principles of how to handle mobile cranes.

Concrete Connect Portal

The Concrete Connect Portal digitally connects all Liebherr Mischtechnik GmbH machinery related to concrete production, concrete transport and the placement of concrete using concrete pumps. This enables the customer to access individual machine data through to processed information relating to their own Liebherr fleet and thus optimise their working processes. Further functions such as maintenance management and interfaces to other systems within the construction process are in development.

Safety

Safety-relevant assistance systems

To make working with wheel loaders safer, Liebherr has developed an extensive range of assistance systems for the operator. For example, active person recognition automatically differentiates between people and objects using sensors and artificial intelligence. The Skyview 360° camera system uses a number of additional cameras to record the machine surroundings and create a bird's eye view.

Another example is the weighing device. It is a check weigher that operates automatically and provides the driver with valuable information about the loading process. This is not just used in wheel loaders, but also in the TA 230 Litronic dump truck.

LiReCon (crawler dozer)

The Liebherr Remote Control system is suitable for all crawler dozer applications and increases safety, comfort and productivity, particularly in dangerous working environments. It consists of the Liebherr teleoperation booth, an advanced operator station with all the necessary controls, and the system information: cameras for different viewing angles, microphones for recording machine sounds, and radio transmitters and receivers.

MyNotifier

The monitoring tool for wind conditions and battery status provides the most important data in real time. The wind sensors on the boom of the crawler crane constantly measure the wind speeds. Depending on the length and configuration of the boom, the maximum permitted values are continuously controlled and adjusted.

An early warning system informs the operator in good time of anticipated critical wind speeds. It helps to prevent dangerous situations – for example, the boom can be lowered in advance of critical wind speeds. For the new Liebherr Unplugged machines, MyNotifier has another vital function: The battery status is displayed live.

Performance

Bucket Fill Assist

The new excavator model series from Liebherr is available with the Bucket Fill Assist function. This assistance system has an 'anti-stalling' mode, which prevents the bucket from getting stuck in the excavated material. In addition to reducing fuel consumption by 10%, the system minimises any vibrations to make work more comfortable. It also reduces wear on the bucket and in turn lowers the operating costs.

LEFT: **MyJobsite, the digital tool for deep foundation machines, provides an overview of all the construction site data at the push of a button.**

BELOW: **For safety in wheel loader operation, active person recognition uses sensors and artificial intelligence to distinguish between people and objects.**

Performance Mobile Cranes

Besides the machine's location data, the fleet data management solution for mobile and crawler cranes shows a host of other live data, like fuel consumption, current wind speed, the load weight on the hook or when the next service is due for the crane. Customers can also generate their own reports in the system for specifically defined construction sites, e.g. on fuel consumption or CO2 emissions.

From 2023, many new cranes will have the necessary cellular modem on board as standard. Cranes in the field can easily be retrofitted in the future. In any case, Liebherr bears the telecommunications costs.

MyJobsite

This digital tool for deep foundation machines simplifies the documentation of data from a variety of sources and their processing, analysis and translation into relevant information such as performance parameters, construction progress or machine utilisation. Quality control can be performed on that basis for certain tasks on the construction site. This lays the foundations for optimising work processes and ultimately saving time and money.

A list of all the work processes can be stored in MyJobsite. In this way, work steps can be carried out systematically. Machine and process data can be accessed live and is constantly updated. The user always has an overview of scheduled, active and completed jobs and therefore of the current progress of the construction site.

Liduro Power Port app

With the app for the LPO mobile energy storage system, the functions and statuses of a fleet of LPOs can be monitored from anywhere, including the state of charge (SoC), power input and output, energy input and output or geolocation. Fleet managers or rental providers can access advanced functions such as measurement of energy input and output for specific time ranges, definition of loading modes, timer and lock modes and monitoring of all devices and SoCs. ■

Website: www.liebherr.com

ROAD TO NUSANTARA

Waskita Karya used digital tools to build section 5A of the IKN toll road

Waskita Karya is the main contractor responsible for the 6.675-km Simpang Tempadung-Jembatan Pulau Balang section 5A of the roadway network, connecting the new IKN VVIP Airport to the new capital's Central Government Core Area (CGCA) via the existing Pulau Balang Bridge.

Indonesia's new national capital Nusantara ('Ibu Kota Nusantara' in Indonesian, or IKN) is scheduled to be inaugurated in August 2024, replacing Jakarta. Spanning approximately 2,560 sq km, this newly planned city is located on the east coast of Borneo in East Kalimantan province, surrounded by hilly landscape, forest, and a natural bay.

Being built with a national identity that promotes economic transformation and tourism, the metropolis is utilising artificial intelligence (AI) and advanced technologies to support sustainable transport, renewable energy, and green development. Connecting roads, government offices, utilities, and all necessary infrastructure are being constructed to achieve intelligent, sustainable industrial development, protecting surrounding forests and facilitating zero carbon emissions to become a world-class smart forest city.

As part of this smart city megaproject, 75.62 km of toll road infrastructure is being constructed to improve connectivity and shorten travel times between the city of Balikpapan and the capital's Central Government Core Area (CGCA) from 2.5 hours to 30 minutes. PT Waskita Karya is the main contractor responsible for the 6.675-km Simpang Tempadung-Jembatan Pulau Balang section 5A of the roadway network, connecting the new IKN VVIP Airport to the CGCA via the existing Pulau Balang Bridge.

"As the main contractor, having a good data communication system between stakeholders is essential to ensure the project is within schedule," said Indah Nurcahyani, BIM engineer at Waskita Karya.

Waskita Karya adopted a digital twin solution to improve communication, eliminating 20,000 truck movements during initial construction and lowering diesel fuel consumption by 32,800 l to save IDR 590 million. For this project, the contractor was named a recipient of Bentley Systems' 2023 Founder's Honors.

Various challenges

While the new purpose-built capital is strategically positioned in the middle of the Indonesian archipelago, the area's topography consists of lush, hilly rainforests dominated by soft soil and clay. "One of the conditions to be considered in determining the design is the extreme terrain, which requires cutting several hills, and the geological conditions, dominated by soft soil and clay layers," said Ms Nurcahyani.

Compounding these site constraints is the need to align the toll road with the Pulau Balang Bridge, which has already been built. From the initial 3D models, Waskita Karya realised that the basic roadway design plan did not support the existing bridge. "There is a horizontal alignment difference of about 1.5 m; for vertical alignment, there is an average elevation difference of 4 m," said Ms Nurcahyani.

The difference in distance and elevation between the toll road and bridge had to be discussed with numerous stakeholders located far from the project site, and a design decision reached quickly to keep the project on schedule. To address these design compatibility issues while ensuring structural integrity amid the challenging terrain and tight construction schedule, Waskita Karya wanted to establish a coordinated design review process that allowed for potential design changes, adjusting the toll road to meet the existing bridge parameters.

"The primary and essential focus is reviewing and changing designs quickly, precisely, and accurately," said Ms Nurcahyani. Waskita Karya needed an easy, fast, and accurate multidiscipline collaboration platform so that the team and stakeholders could virtually visualise and communicate to make timely, optimal decisions regarding design changes.

Collaborative workflows and digital twins

Waskita Karya set up a common data platform using ProjectWise for all participants to access current project information. With iTwin, the team established a real-time, cloud-based design review environment. The team also performed a site survey using drones to capture high-resolution imagery of existing topography and bridge conditions and, using iTwin Capture Modeler (formerly ContextCapture), processed the images into a reality mesh.

"We captured over 10,000 images and processed them in iTwin Capture Modeler, generating a high-fidelity 3D model of the existing bridge that was then uploaded to the cloud," said Ms Nurcahyani. Integrating Bentley's open 3D modelling applications, the team created a 3D design model and digital twin of the bridge and toll road.

Working in a collaborative digital environment, Waskita Karya reviewed and commented on the models and performed clash detection to virtually predict potential construction issues. As discussions progressed and the team made decisions regarding design changes, it seamlessly updated and synchronised the models via Bentley's iTwin Platform, eliminating time-consuming file import and export processes. Field crews also had access to the digital twins via tablets to record their inspections directly on the models.

"Working with the 3D digital twins means that the field team could inspect the basic design plan remotely, record their findings directly on it, and accurately pinpoint the areas in need of repair," said Ms Nurcahyani. The cloud-based digital twin solution streamlined collaboration among Waskita Karya's designers and construction personnel, accelerating informed decision-making to ensure bridge and roadway alignment and keep the project moving forward.

'Saving critical time and costs'

Bentley's integrated modelling applications provided a connected digital ecosystem to generate digital twins and perform real-time coordinated design reviews, reducing design time by 40% and field inspection time by 50%. "The digital twins provide valuable data and information and function as a communication tool, enabling real-time collaboration and problem solving among the team, without disrupting current processes," said Ms Nurcahyani. By optimising the horizontal and vertical alignment of the road within a 3D virtual design environment, Waskita Karya saved IDR 12.5 billion in potential rework costs in just the first kilometre of the design plan.

Using Bentley software as an environmental and digital design and construction management platform, Waskita Karya could link multiple data sets, resolving visibility issues and providing accurate material information to construction teams. This practice saved critical time and costs while achieving higher quality deliverables, compared to previous design workflows. The digital twin solution improved communication among engineers, field personnel and stakeholders, eliminating 20,000 truck movements during initial construction and lowering diesel fuel consumption by 32,800 l to save IDR 590 million.

Establishing a connected digital ecosystem and single source of truth enhanced design quality, mitigated risks and provides a solid digital framework for construction. "The project is now under construction, and we anticipate a more accurate design to minimise the need for [on-site] rework and associated costs," said Ms Nurcahyani. ■

Website: www.bentley.com

All images: PT Waskita Karya (Persero) Tbk

IN THE FAST LANE

Three pavers and a material feeder from Vögele carried out the four-layer paving operation to build a new race track close to the town of Minamiboso in Japan.

A new private racing circuit has recently been built in Japan, located about 70 km from Tokyo and close to the town of Minamiboso. This 3.5-km circuit features steep downhill gradients of up to 16% and uphill gradients of as much as 19%. The longest straights extend for 800 m and there are also chicanes and tight corners with a 14 m radius.

To deliver this challenging project, paving contractor Maeda Road Construction Co Ltd deployed four Vögele machines, comprising Super 1800-3i and Super 1803-3i Universal Class pavers and a 1900-2 Highway Class paver to complete the paving, while an MT 3000-3i Offset material feeder was used to transfer asphalt from the truck to the material hoppers of the pavers.

The three pavers paved four layers totalling just under 100,000 sq m – an 18-cm non-bonded base course, a 12-cm bonded base course, a 6-cm binder course and a 4-cm surface course. In addition to the racing circuit measuring 36,000 sq m, paving work involved another 60,000 sq m of run-off area, pit lane and service roads. A Super 1900-2 paver was responsible for producing these secondary areas and the base courses.

'Hot to hot' paving

The pavers worked mainly 'hot to hot': two machines paved together at a slight offset to produce an asphalt surface without joints, measuring 8 to 12 m across the full width of the carriageway. This ensures that the carriageway provides both high resistance to deformation and a long service life.

The different undercarriage concepts also offer a number of benefits. The Super 1800-3i tracked paver is characterised by a high degree of traction and maintains consistent straight-line travel, whilst the Super1803-3i wheeled paver is particularly good at producing corners with a tight radius, as its undercarriage enables the machine to steer sensitively and smoothly. As a

result, the paving team used the Super 1803-3i primarily on inside corners.

Meanwhile, the Vögele MT 3000-3i Offset material feeder decouples the transfer of material from the truck to the paver to ensure a constant, efficient paving process. Conical augers in the receiving hopper of the material feeder convey the material crosswise to render it thermally homogeneous.

Furthermore, the material feeder features effective heating of both conveyor and transfer points, actively counteracting cooling and segregation of the material. Another highlight is that, the 'Offset' version of the machine has a height-adjustable conveyor that can pivot 55° to the left and right. The discharge point into the extra material hopper of Super pavers can be as high as 3.6 m, optionally up to 3.9 m. It is controlled ergonomically by a joystick.

Despite the extreme grade and slope, the pivoting conveyor meant that on this jobsite, the MT 3000-3i Offset could continuously feed two pavers with material alternately without the need to manoeuvre constantly, thus increasing efficiency and paving quality. ■

Website: www.wirtgen.com

LEFT: **There are uphill gradients as steep as 19% on the new race track, and also downhill gradients as much as 16%.**

BELOW: **The Vögele pavers worked 'hot to hot' to deliver a high-quality asphalt surface across the full width of the carriageway.**

Granirapid System cementitious adhesive system from Mapei was used to bond the stone slabs in the Pikes Peak Summit marker.

BUILDING AT THE TOP OF AMERICA'S MOUNTAIN

At 4,302 m above sea level, Pikes Peak Summit is one of the most visited mountains in the world. Its new visitor centre is currently the most sustainable high-altitude structure in the US.

Known as 'America's Mountain', Pikes Peak has been designated as a National Historic Landmark in the US, featuring a summit of 4,302 m above sea level. It is one of the most visited mountains in the world and a top tourist destination in the state of Colorado.

Maintained by the City of Colorado Springs, which sits at the base of the mountain, the new visitor centre at the summit was completed in 2021 and has attracted an estimated 750,000 people per year.

Highly sustainable structure

To ensure that the construction of the visitor centre was environmentally sound, the City of Colorado Springs decided to pursue multiple green building certifications, including LEED and the Living Building Challenge (LBC). For instance, in addition to the logistics of just getting materials up the mountain, the Pikes Peak design team considered factors including designing the building in such a way as to be net-zero water-ready. This means that the building is able to, among other features, gather and reuse rainwater and snow.

The sustainability team at Mapei Corporation, the US subsidiary of Mapei Group, has been involved in the project since early 2019, consulting with the tile contractor, architectural firm and general contractor to make recommendations and provide sustainable products that meet the requirements of both certifications.

Article courtesy of Realtà Mapei International 96

Several Mapei products were also used to install and grout ceramic floors in the kitchen, restaurant, shop and toilets.

"We advocate to be involved with the design team early in a project, especially when it comes to sustainability, as the design and construction teams are not expected to know every manufacturer's product line inside and out. Then add having to know each product's sustainable attributes and certifications on top of that," said Brittany Storm, sustainability manager at Mapei Corporation.

However, what works for one green building system may not work for another. Speaking about the challenge, Ms Storm explained, "We had to work with contractors, design team and construction team to strategically select products that not only met the performance, aesthetic and other traditional considerations but also LEED's and LBC's sustainability requirements

"While there are synergies between the two green building standards, there are also product requirements that would work for one standard but not the other. We had to juggle both standards and find products that took both traditional (durability, technical performance and aesthetic impact) and sustainable considerations into account."

This effort eventually paid off as the Pikes Peak Summit Visitor Centre achieved LEED Platinum certification and is currently the most sustainable high-altitude structure in the US.

Various Mapei solutions

Overall, more than 15 Mapei solutions across three product lines were chosen to build the visitor centre due to their sustainability features, such as low emission level of volatile organic compounds, use of recycled materials and local raw materials, environmental product declarations, etc. They were employed in both external and internal areas.

Inside the monument that marks the summit of Pikes Peak, the substrates were waterproofed by applying Mapelastic Turbo elastic membrane, while the stone slabs were installed using Granirapid System cementitious adhesive system. The joints were grouted with Ultracolor Plus FA cementitious mortar, and the expansion joints were sealed with Mapesil T elastic sealant.

In the interior areas of the centre, Mapei systems were used to prepare the substrates for all the floors, consisting of Primer L acrylic primer, Novoplan Easy Plus levelling mortar and Mapecem Quickpatch patching compound. For the toilets, Mapelastic Aquadefense ultra rapid-drying, elastic, liquid waterproofing membrane was chosen. The installation of ceramic tiles on the stairs was carried out using Ultraflex 3 one-component, modified polymer-based adhesive.

Different types of grouts for joints were selected based on their applications: Ultracolor Plus cementitious grout for the joints in the ceramic flooring in the entrance and sales areas; Kerapoxy CQ bacteriostatic epoxy grout with BioBlock technology for the joints in the bathrooms, thanks to its excellent cleanability, resistance to aggressive substances and general healthiness; and Kerapoxy IEG CQ epoxy grout for the joints in the kitchen because of its high resistance to stains, high temperatures and frequent cleaning with enzymatic cleaners.

Furthermore, Keracaulk S sealant was used to seal the floor/wall joints and the joints in the corners of the floor and wall coverings. Planigrout 755, Planigrout 712 and Planigrout 728 non-shrinking construction grouts were used to create the cementitious baseplates for the wastewater treatment equipment. ■

Website: www.mapei.com.sg

Note: Products mentioned in this article (except for Mapelastic Aquadefense, Mapelastic Turbo and Kerapoxy CQ) are only available in North America. Alternative products are available in the Singapore market. Please contact the customer service representative at Mapei Far East for more details or visit the website.

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KEEP ON CRUSHING

The Rockster R1100S impact crusher with a screening system recycling concrete at a demolition site in a residential area of New Haven, Connecticut, USA.

A recent project commissioned by the city of New Haven in Connecticut, USA, aimed to demolish a number of low-income houses to make room for new ones. The project's contractor, SRC Construction, deployed a Rockster R1100S track-mounted impact crusher to help deliver the job.

On-site recycling

The R1100S impact crusher was supplied by Equip Sales & Leasing Corp, a Rockster distributor on the east coast of USA. For this project, recycling and reusing the final material on-site have proven to be extremely efficient and cost-effective. Such an approach was not only saving costs, but also adding value to the production of aggregate on-site. Recycled concrete with a feeding size of roughly <500 mm (up to 20-in) was recycled to a 0/32 mm (1.25-in) final product and later used for new building sub-base.

The R1100S crusher recycling mainly concrete with a feeding size of <500 mm and crushing it down to 0/32 mm.

Powered by a 380-hp Cat engine in combination with a hydrostatic drive system, the Rockster R1100S continuously processed about 1,400 t of material per day and the project took only one month to complete. With the demolition site located in a residential area and right across the street from a school backyard, a dust suppression system was necessary.

"The Rockster R1100S was perfect for this job. It was across from a school, so the impactor performed great with the dust suppression system. No dust contaminates left the job site," said Tim, Equip Sales operator who oversaw the project.

Highly mobile

"Being mobile worked very well for moving across the site," added Tim. One of the main advantages of the Rockster R1100S is its compact size, resulting in high mobility. Plus, its compact dimensions and weight make the transport of the machine from one jobsite to another very economical and productive. This was the case with the New Haven project where the crusher needed to move, and due to its track-mounted system and a radio remote control, the R1100S is easy to operate

"The R1100S is equipped with a standard magnetic separator. That way I know the iron rebar from the reinforced concrete will be removed and the customer is getting clean material," explained Tim.

With a radio remote control, the Rockster R1100S crusher can be operated easily and efficiently.

Standard equipment on the R1100S crusher also includes a vibration feeder with two-step prescreen, an adjustable bypass chute, a crusher overload protection system, a sound insulated engine housing, a dust suppression system and a central control unit with colour display. All of these just add to the convenience and ease of operating a Rockster crusher. ■

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The Worldwide Leader in Concrete Paving Technology

GOMACO offers the full range of concrete slipform pavers, curb and gutter machines, trimmers, placer/spreaders, texture/cure machines, and bridge/canal finishing equipment. GOMACO equipment features our exclusive and proprietary G+® control system, created in-house by our software engineers from the wants and needs of contractors paving in the field. At the heart of GOMACO equipment is our passion for concrete and our commitment to our customers. We look forward to visiting with you at Bauma in Munich, Germany, about your upcoming paving projects and your concrete paving equipment needs. Our worldwide distributor network and our corporate team always stand ready to serve and assist you.

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