SOUTHEAST·ASIA CONSTRUCTION

NOVEMBER - DECEMBER 2024

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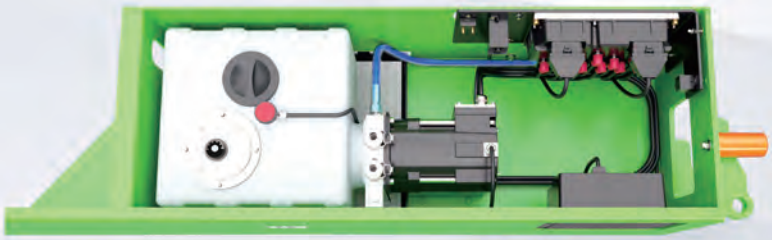

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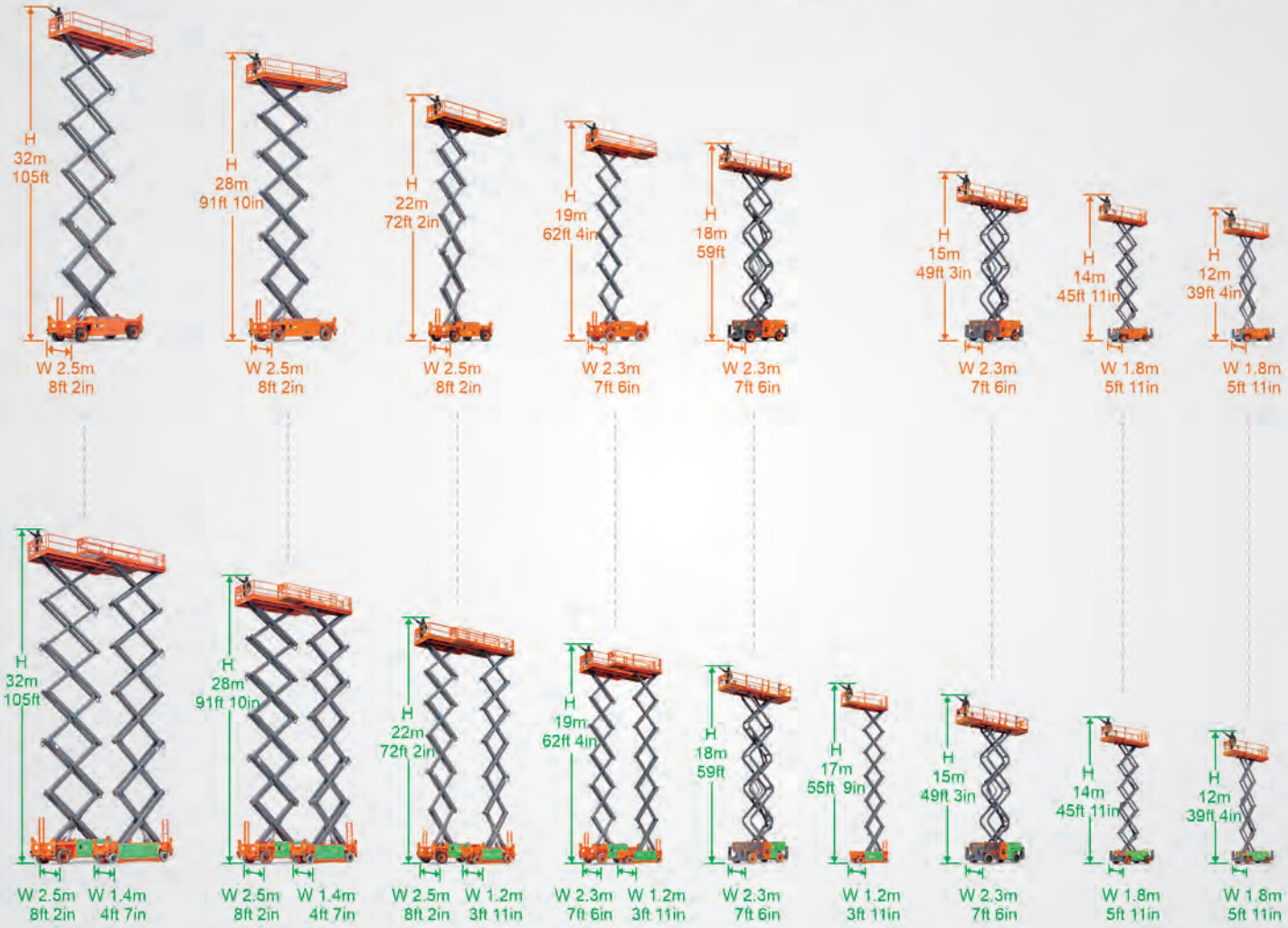

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ADB supports Laguna Lakeshore expressway project in Philippines

The Asian Development Bank (ADB) has approved financing of up to almost US$1.7 billion to help build a climate-resilient 37.5-km expressway along the Philippines' biggest lake to promote regional connectivity, reduce travel time between the capital Manila and Laguna province, and further improve the competitiveness of one of Southeast Asia's fastest growing economies.

Under the Laguna Lakeshore Road Network Project (LLRN), ADB will fund the construction of a 29.56-km section of the new expressway, including bridges and viaducts that will traverse waterways flowing into the Laguna Lake, located southeast of Manila. The project aims to provide the most resilient road link within the southern Manila transport corridor and cut peak hour travel time between Taguig City in Metro Manila and Calamba City in Laguna province by 25%.

The 7.89-km northern section of the new expressway will be funded by a US$904.35 million loan from the Export–Import Bank of Korea, Economic Development Cooperation Fund under a parallel financing scheme.

ADB's support to LLRN will be via a multitranche financing facility consisting of two loans, a US$1.2 billion first tranche loan, and a US$509.5 million second tranche loan. The Asian Infrastructure Investment Bank is cofinancing the project with an additional US$188.2 million loan.

The project is expected to benefit about 3.47 million people residing along the lake and nearby areas and improve access to markets and public services. The north–south corridor around the lake is crucial for local and international transit of goods, accounting for nearly one-third of nationwide cargo in 2021.

The ADB loan includes climate financing of US$35.6 million to cover mitigation and adaptation measures, including elevating viaducts and construction of armoured lakeside embankments. The LLRN is part of ADB's holistic support to strengthening climate-resilient infrastructure in the Philippines. This range of support includes assistance in developing the Laguna Lake masterplan and climate-resilient infrastructure standards, and the implementation of climate plans as specified in the country's Nationally Determined Contribution and National Adaptation Plan.

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

The Laguna Lakeshore Road Network Project aims to provide the most resilient road link within the southern Manila transport corridor and cut peak hour travel time between Taguig City in Metro Manila and Calamba City in Laguna province by 25%.

LLRN is aligned with the government's Luzon Economic Corridor initiatives that support connectivity between Manila and international trade hubs in nearby areas such as Subic Bay and Clark, north of the capital, and Batangas province in the south.

ADB has been helping the Philippines in developing an integrated transport network by financing several flagship transport projects, like the Malolos–Clark Railway Project, South Commuter Railway Project and Bataan–Cavite Interlink Bridge Project.

The LLRN project also aims to enhance the capacity of the implementing agency, Department of Public Works and Highways (DPWH), to implement the project and operate and maintain the road network under a public–private partnership scheme. An international consulting firm was mobilised under the ADB-financed Infrastructure Preparation and Innovation Facility (IPIF) to assist the DPWH with the project's feasibility study, detailed engineering designs, and tender documents. ■

L&T to work on India's Agra Metro Network

The Heavy Civil Infrastructure vertical of Larsen & Toubro has secured a contract from Uttar Pradesh Metro Rail Corporation Ltd (UPMRCL) for the design and construction of Agra Metro Phase 1, Line-2. The stretch will run from Agra Cantonment to Kalindi Vihar.

The scope of works involves design and construction of a vital 15.09-km elevated viaduct, 14 stations and 2.61-km depot connecting the metro line from Sadar Bazar to PAC Depot. Architectural finishes for the stations, as well as electrical and mechanical works, are also part of the scope.

This project, which will mark a key milestone in enhancing urban mobility in Agra, is to be completed within a stringent timeline of 30 months. ■

Lintec & Linnhoff appointed as official distributor for Power Curbers in Singapore, Malaysia and Brunei

Lintec & Linnhoff has been appointed as the official distributor for Power Curbers in Singapore, Malaysia and Brunei. This strategic collaboration will enable Lintec & Linnhoff to offer a wider range of high-quality concrete paving solutions to customers across these key markets.

By combining the expertise of both companies, this partnership will also enhance Lintec & Linnhoff's product portfolio and reaffirm its commitment to delivering innovative construction equipment and exceptional service across Southeast Asia.

"Lintec & Linnhoff is proud to be named Power Curbers' official distributor across Singapore, Malaysia and Brunei and is thrilled with the addition of the company's products to our existing portfolio of equipment brands. We look forward to a successful collaboration as we continue to expand our business footprint in Southeast Asia," said Tee Peow Aik, group chief operating officer at Lintec & Linnhoff.

"Given Lintec & Linnhoff's renowned reputation in the construction equipment market, we have great confidence that this agreement will provide new and exciting opportunities for our customers," said Marc Van Gemert, international sales manager at Power Curbers. "We are confident that their strong market presence and commitment to customer service will bring added value to our product range in these key markets."

Innovative paving solutions

The Power Curber 5700-D curb & gutter machine is a 'one-machine solution' that can easily handle curb & gutter work, highway safety barriers, irrigation ditches, sidewalks and other special applications. The upgraded Power Curbers SlipSmart control solution provides contractors with a new level of responsiveness, simplicity and precision. The compact size of the 5700-D makes tight jobs easier to do than ever.

Another model is the Power Curber 7700 multipurpose slipform machine, designed for a wide variety of offset and paving applications. Like the other machines from Power Curbers, it is as easy to operate as it is versatile. In addition, the Power Paver SF-3404 is one of the most innovative full-width slipform pavers on the market. This new four-track paver is operator-centric and has an optional compact dowel bar inserter (DBI). ■

FROM LEFT: **Christabel Chan (global business director) and Tee Peow Aik (group COO) of Lintec & Linnhoff, with Marc Van Gemert (int'l sales manager) and Juan Luis Fumadó (int'l sales director) of Power Curbers.**

The Power Curber 5700-D curb & gutter machine is a 'one-machine solution' that can easily handle curb & gutter work, highway safety barriers, irrigation ditches, sidewalks and other special applications.

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The new Power Paver SF-3404 is one of the most innovative full-width slipform pavers on the market.

New landmark of Asia: AAHK unveils expanded blueprint for Hong Kong's Airport City development

The Airport City at Hong Kong International Airport (HKIA) will be transformed into a new, world-class landmark that integrates commercial activities, popular culture, art trading, entertainment and leisure under an expanded development blueprint spearheaded by the Airport Authority Hong Kong (AAHK), with the aim of driving further economic development of Hong Kong and the Greater Bay Area.

First unveiled in 2019, the Airport City blueprint combines the airport's core functions with related business segments to create strong synergy, fully leveraging the airport's geographical location with a view to seizing the opportunities brought by various new infrastructures. AAHK has since proactively taken forward several projects, including a new hotel and three Grade-A office towers, both already opened for business; as well as 11 Skies, a complex integrating retail, dining and entertainment facilities scheduled to open in phases from the second half of 2025.

The expanded Airport City blueprint is underpinned by land resources on the Hong Kong Port Island of the Hong Kong-Zhuhai-Macao Bridge (HZMB) and the bay area between the airport island and Tung Chung, more than doubling the scale of development.

New projects include an ecosystem for the art industry, AsiaWorld-Expo Phase 2 development, a marina with ancillary facilities, a fresh food market, and more. These new projects will promote high-end commercial, tourism and leisure activities, and are expected to be completed from 2026 to 2031.

A variety of new facilities

AAHK is formulating plans to create an art ecosystem at HKIA, and is also taking forward the Phase 2 development of AsiaWorld-Expo. The latter will consist of Hong Kong's largest multi-purpose indoor arena with a seating capacity of over 20,000 people, and more convention and exhibition facilities.

In addition, AAHK will fully utilise the water resources adjacent to the airport island to introduce Hong Kong's biggest marina and ancillary facilities, providing around 600 berths. This will enable the Airport City to become a new yacht tourism destination in Asia, especially in the Greater Bay Area, featuring a diverse range of water leisure and recreational facilities.

Different kinds of indoor and outdoor leisure, cultural and entertainment facilities will be developed along the coastlines of the airport island and the Hong Kong Port Island, with hotel development and promenades of distinct characteristics.

Also on the Hong Kong Port Island, AAHK is making plans for a brand-new sportainment complex that will combine novel indoor and outdoor sports concepts for adventure, exploration, sports and entertainment; plus a 'Jet Fresh Market' to consolidate the city's position as the hub of high-end fresh foods from around the world.

"HKIA is a leading international aviation hub in Asia. With the three-runway system fully operating by the end of this year, we are in a position to press full steam ahead with innovative projects in different market segments," said Fred Lam, chairman of AAHK.

"The expansion of the development blueprint will focus on leveraging Hong Kong's unique advantages and creating synergy among various projects to transform the Airport City into a new landmark of Asia. It will be a distinct tourist hotspot for visitors from Hong Kong, the Greater Bay Area and all over the world, especially premium visitors, injecting impetus into the economic growth of Hong Kong and the region." ■

AAHK will expand the Airport City development blueprint.

The AsiaWorld-Expo Phase 2 will include Hong Kong's largest multi-purpose indoor arena.

All images: Airport Authority Hong Kong

ABOVE: **Pedestrian walkways and leisure facilities along the Airport Tung Chung Link.**

LEFT: **The Airportcity Link, with a pedestrian walkway, will connect the Hong Kong Port of HZMB and 11 Skies.**

Malaysia's ECRL Gombak Tunnel achieves breakthrough

The East Coast Rail Link (ECRL) project's 959-m Gombak Tunnel recently broke through, one month ahead of schedule, becoming the 36th ECRL tunnel to successfully complete the excavation process to date.

The final blast at the Gombak Tunnel punched through the last barrier some 38 m from the tunnel's entrance portal. This achievement is a culmination of approximately 5,813,560 man-hours and the adoption of the drill-and-blast method of tunnelling that bored through primarily weathered granite.

The permanent lining for the Gombak Tunnel has progressed to 892 m prior to the breakthrough ceremony on 29 October 2024. The tunnel has an average height of 12 m and width of 13 m, thus providing the space for two standard gauge railway tracks upon completion.

The excavation work for Gombak Tunnel commenced in June 2023, with the breakthrough originally scheduled for the fourth quarter of 2024. All related civil works for the tunnel are expected to be fully completed by March 2025.

The construction of the tunnel will enable the ECRL railway track to comply with its maximum gradient of 0.9% as well as avoid major open forest cutting at the Batu 11 Gombak area.

The ECRL project features the construction of 41 tunnels with a total length of about 69 km along its rail alignment, of which 21 tunnels are located within Section A (Kota Bharu-Dungun) and Section B (Dungun-Mentakab), while the remaining 20 tunnels are situated in Section C (Mentakab-Port Klang).

Of the 20 ECRL tunnels in Section C, a total of nine tunnels are located within Selangor. These include the 3.50-km Serendah 1 Tunnel and 9.85-km Serendah 2 Tunnel which are both under excavation.

"The ECRL Gombak Tunnel breakthrough marks another milestone in the project's progress as it is an integral component for the completion of the ECRL alignment from Kota Bharu, Kelantan to the Gombak Integrated Terminal, Selangor by December 2026," said Dato' Sri Darwis Abdul Razak, CEO of Malaysia Rail Link (MRL), the ECRL project owner.

"We are optimistic to commence ECRL operations from January 2027 onwards to align with the aspirations of the people and the business communities by providing seamless transportation for passengers and freight respectively." ■

AP Rentals named Jekko dealer in Hong Kong, Macau and Singapore

Italian mini crane manufacturer Jekko has expanded its presence in Asia with the appointment of a new dealer, AP Rentals Limited, which will serve Hong Kong, Macau and Singapore markets.

Based in Hong Kong, AP Rentals operates in construction, E&M engineering, and event and entertainment businesses, providing rental and sales of power and energy, lifting and material handling equipment.

Founded 45 years ago by Thomas P S Lau and Chan Kit Mui, its parent company AP Rentals Holdings Limited has been listed on the Main Board of The Stock Exchange of Hong Kong Limited since 2016.

AP Rentals' rental fleet comprises diesel generators, air compressors, diesel welders, light towers, articulated boom lifts, diesel and electric forklifts, telehandlers and cranes. The company offers various services, such as project analysis, machine application, project evaluation, training, service and spare parts supply.

For the Jekko brand, AP Rentals will provide rental, sales, service, parts and technical consulting for the whole range, which includes the SPX mini cranes (2.8-8 t), JF articulated cranes (6.1-21.5 t) and MPK minipickers (0.6-5 t).

"I am fully confident that the choice of AP Rentals as a partner will take us a fundamental step forward," said Diego Tomasella, Jekko CEO. "Its strong company structure with a well-trained and motivated team and an in-depth market knowledge offer us key insights on the current market needs an on the upcoming developments. This feedback is a fundamental help for Jekko to tailor its offerings to meet specific regional demands. We are convinced that our user-friendly and technologically advanced cranes will be appreciated by operators since they will easily understand the flexibility of use that is unattainable by other types of cranes."

Thomas P S Lau, AP Rentals chairman and CEO, added, "We are happy to start the business with Jekko since we have known this brand for more than eight years. We will establish the application & service support to Jekko machines to offer best highlights and continuous customer support in Hong Kong and Asia Pacific area." ■

AP Rentals Limited has been appointed as Jekko dealer for Hong Kong, Macau and Singapore markets.

For the Jekko brand, AP Rentals will distribute the SPX mini cranes, JF articulated cranes and MPK minipickers.

Surbana Jurong, Hyundai E&C sign MOU to collaborate on renewable energy and infrastructure projects

Singapore's Surbana Jurong Group (SJ) has signed a memorandum of understanding (MOU) with South Korea's Hyundai Engineering & Construction Co Ltd (Hyundai E&C) to explore opportunities in renewable energy, construction technology, and infrastructure related to small modular reactors (SMR). The MOU ceremony was part of the Singapore-Korea Business Forum that took place on 8 October 2024 in Singapore.

This strategic partnership leverages the respective strengths and expertise of Hyundai E&C and SJ to advance sustainable practices within the built environment industry while addressing global energy challenges. Hyundai E&C is renowned for its extensive track record in construction, while SJ has extensive experience in multidisciplinary consultancy services across the built environment and energy sector, including clean fuels, new energies, energy transition, engineering and project management.

Key objectives of the MOU include:

1). Exploration of collaborative projects: Hyundai E&C and SJ will jointly identify potential projects within the realms of renewable energy and infrastructure.

2). Research and development: Hyundai E&C and SJ will jointly undertake R&D initiatives focusing on low-carbon business practices and innovative construction technologies, such as carbon capture and storage (CCS) and prefabricated prefinished volumetric construction (PPVC).

3). Cooperation on infrastructure technology: The MOU outlines plans for general cooperation in infrastructure technology, including construction automation or robotics, collaborative workshops, training programmes, and technical support.

4). SMR: Hyundai E&C and SJ will also collaborate on opportunities related to SMR technologies, an area critical for Singapore's future needs.

The MOU ceremony was part of the Singapore-Korea Business Forum that took place on 8 October 2024. Present at the ceremony were (from left): Young-joon Yoon, president and CEO of Hyundai E&C; Ahn Duk-geun, South Korea's Minister of Trade, Industry and Energy; Tan See Leng, Singapore's Minister of Manpower and Second Minister for Trade and Industry; and Sean Chiao, group CEO of SJ.

"The transition to net zero is underway, but it's not happening fast enough, and the demand for resilient infrastructure has never been greater," said Sean Chiao, SJ's group chief executive officer. "By joining forces, Hyundai E&C and SJ aim to push the boundaries of sustainable practices in the built environment and address global energy challenges head-on. SJ's multidisciplinary consultancy, deeply rooted in sustainability, combined with Hyundai E&C's world-class engineering and construction expertise, will drive innovation in clean energy solutions and advanced construction technologies, paving the way for a greener, more resilient future."

A representative from Hyundai E&C stated, "Since entering the Singapore construction market in 1981, Hyundai E&C has actively contributed to the country's economic development through major infrastructure projects, including the construction of Changi International Airport, Marina One, South Beach, and Southeast Asia's largest underground substation.

"With this business partnership with SJ, a leading built environment consultancy with a long track record of successful project delivery, we will make every effort to accelerate Singapore's energy transition based on the strengthened collaboration network at both the government and group levels and the trust we have built with the Singapore government and clients." ■

YTL Cement completes acquisition of Singapore's NSL Ltd

Malaysia's YTL Cement Berhad has acquired an 81.24% stake in Singapore-based NSL Ltd, effective 1 October 2024. With this acquisition, NSL is now officially part of the YTL Cement Group.

NSL Ltd is a prominent industrial group in Asia Pacific, with a strong presence in Singapore, Malaysia, Dubai and Finland. Established in 1961 as The National Iron and Steel Mills to support Singapore's nation-building efforts, NSL has grown to become a market leader in precast and prefabricated bathroom units (PBU) and environmental services. Its Precast & PBU division is a key player in Singapore, Malaysia and Dubai, while its PBU business dominates the Scandinavian market. ■

Manitou Asia appoints new dealer in Thailand to distribute Gehl equipment

Manitou Asia Pte Ltd has signed a new dealership agreement with Pin Siam Company Limited to distribute Gehl branded compact equipment in Thailand, including telehandlers, backhoe loaders, skid steer loaders and track loaders. This partnership marks another key advancement in Manitou Asia's strategy to expand its market presence in the earthmoving equipment sector throughout the region.

Pin Siam's strong reputation and extensive network across Thailand, including locations in Bangkok, Wang Noi, Lampang, Hat Yai, Udon Thani and Surin, makes them an ideal partner, said Manitou Asia. "This collaboration will further enhance our reach, supported by Pin Siam's team of highly skilled technicians, who bring extensive experience and expertise in specialised heavy machinery," added the company.

Established in 1997, Pin Siam started its business with the service of distributing second-hand heavy machinery, spare parts, and maintenance of heavy machinery. In 2014, the company began to serve as a distributor of new and second-hand heavy machinery from recognised brands in Thailand.

"At Pin Siam, we focus on representing equipment brands that are known for their high quality, reliability and efficiency, and Gehl meets all these criteria. Although telehandlers, skid steer loaders and backhoe loaders have not yet gained significant traction in the market, we recognise their potential," said Kirk Burapachaisri, managing director of Pin Siam Company Limited.

"While promoting these products in Thailand presents its challenges, the market remains less saturated compared to other heavy equipment categories, such as excavators. We are dedicated to establishing ourselves as the leading provider in these machine categories over the long term."

"Partnering with Pin Siam is a strategic move that aligns with our vision of expanding the Gehl Compact Equipment's footprint across Thailand," said Bernd Freudenmann, vice president APAC for Manitou Group. "Pin Siam's comprehensive network makes them an ideal partner to drive growth in this market. Together, we are confident in our ability to introduce reliable solutions that will meet the evolving demands of the construction industry in Thailand." ■

ABOVE: **Manitou Asia has officially appointed Pin Siam as its new dealer in Thailand for Gehl branded compact equipment.**

BOTTOM LEFT: **Gehl telehandlers (pictured) will now be available in Thailand, along with backhoe loaders, skid steer loaders and track loaders.**

Bentley partners with Google to bring powerful geospatial context and capabilities to infrastructure

Bentley Systems has announced a strategic partnership with Google to integrate Google's high-quality geospatial content with Bentley's infrastructure engineering software and digital twin platform to improve the way infrastructure is designed, built and operated.

As a digital representation of the physical world, digital twins unlock meaningful value and insights throughout the infrastructure lifecycle, from project planning and design through construction and asset operation. By leveraging the engineering data created and managed in Bentley software alongside Google's geospatial data, AI and analytics, and cloud technologies, engineers can design and manage infrastructure in context and at scale to address today's most urgent challenges, from mitigating climate risk to maintaining ageing infrastructure.

Through the partnership, Bentley software users and developers can use Google Maps Platform's geospatial content, including Google's Photorealistic 3D Tiles, for real-world geospatial context and immersive 3D experiences in their digital workflows. This partnership complements Bentley's recent acquisition of Cesium, the foundational open platform for creating powerful 3D geospatial applications. Cesium is the creator of the 3D Tiles open standard used by Google. Bentley is also collaborating with Google Cloud to deliver AI-driven insights for asset analytics.

"By combining Google's extensive geospatial content and cloud capabilities with Bentley's infrastructure engineering software and digital twin platform, infrastructure professionals can improve their work and ensure projects and assets are created and operated with greater resilience and sustainability," said Bentley CEO Nicholas Cumins. "This partnership demonstrates how open standards, such as 3D Tiles, can help infrastructure professionals evolve their practices by leveraging the power of geospatial context."

Image: Bentley Systems

Bentley software users and developers can use Google Maps Platform's geospatial content, including Google's Photorealistic 3D Tiles, for real-world geospatial context and immersive 3D experiences in their digital workflows.

Chris Phillips, vice president and general manager of Geo at Google, commented, "Photorealistic 3D Tiles in Google Maps Platform power breathtaking immersive experiences and can transform workflows for architects, engineers and urban planners. We're excited to partner with Bentley to bring powerful geospatial context and capabilities that can dramatically improve how infrastructure is designed, built and operated with data." ■

Yanmar CE establishes Asia, Oceania and Latin America (AOLA) region, led by Naoki Maehara as president

Yanmar Compact Equipment (Yanmar CE) has announced the creation of its Asia, Oceania and Latin America (AOLA) region, which is led by Naoki Maehara as president (pictured), effective 1 October 2024.

A seasoned Yanmar executive, Mr Maehara has over two decades of domestic and international experience within the company, in marketing and strategy roles, in multiple divisions (marine, agriculture, construction and Yanmar Holdings headquarters), and most recently served as chief strategy officer of Yanmar CE. His leadership of the newly formed AOLA region will focus on executing the company's strategic vision and driving growth in these key markets.

With this latest move, Yanmar CE aims to expand its footprint in some of the world's fastest-growing economies. Currently, the company's business in the AOLA region spans 26 countries, including major markets like India, China, Brazil, Indonesia and Australia, with a combined population exceeding two billion. Its long-term potential for compact equipment sales growth is immense, driven by urbanisation, industrial development and the shift towards machine-assisted labour, particularly in sectors such as construction, utilities and demolition.

"AOLA presents unique growth opportunities. Customer requirements differ greatly in these developing nations, where durability and competitive pricing are essential, compared to the high-end market demands of customers in markets such as Japan, Europe and the US," explained Mr Maehara.

Yanmar CE's new AOLA region has ambitious growth objectives, including developing a more market-appropriate product portfolio, strengthening the distribution channel and boosting organisational growth. "We need to launch competitively priced products that are durable and suited to the needs of developing countries," said Mr Maehara. "Additionally, we will look to strengthen our distribution network on both sales and aftermarket customer support, in order to maintain strong long-term relationships with customers."

The company plans to leverage its already strong market presence in countries like Brazil, South Korea and New Zealand, and grow its presence in markets such as Thailand and India. "The AOLA region will play a critical role in Yanmar CE's winning aspiration to become a global leader in compact equipment," said Mr Maehara. ■

Tadano to acquire transportation system business of IHI Transport Machinery

Tadano has announced that it will acquire the transportation system business of IHI Transport Machinery Co Ltd, a consolidated subsidiary of IHI Corporation based in Koto-ku, Tokyo, Japan.

The acquisition aligns with Tadano's mid-term management plan for promoting strategies to deliver new value for its customers' business endeavours by diversifying the equipment portfolio to include a broader set of lifting solutions. It represents an important addition to Tadano's growth strategy, advancing its position in the global lifting equipment market.

With over 50 years of experience in engineering and manufacturing, IHI Transport Machinery's transportation systems business includes jib climbing cranes, port and large offshore cranes, wind power cranes, and bulk handling systems.

This acquisition brings valuable expertise to Tadano, building on its achievements and enabling synergies with Tadano's German-based crawler crane business.

"We are excited to further enact our mid-term management plan through this acquisition. Tadano remains focused on the global lifting market and offers over a century of industry experience. However, tower and port cranes are new products for our group, and they give Tadano the ability to develop deeper relationships with our customers and better serve their lifting needs," said Toshiaki Ujiie, president, CEO and representative director of Tadano Ltd.

"Additionally, the ring lift cranes offer many synergies with our lattice boom crawler cranes manufactured by Tadano in Germany, and we anticipate these cranes will supplement our offshore wind power equipment needs."

Toshiaki Ujiie, president, CEO and representative director of Tadano Ltd.

Through the transportation system business acquisition, Tadano will provide management of the new business through planning, development, design, manufacturing, sales, installation, maintenance, repair and operation of the new crane equipment. The lines are expected to support the general industrial, construction, port and offshore, wind power, and bulk handling systems business segments. ■

Singapore's public housing projects deploy autonomous tower crane with Skyjuster

In 2022, Singapore's Housing and Development Board (HDB) launched the Construction Transformation Project (CTP) to kick-start the next phase of HDB's productivity transformation journey towards its 2030 target, adopting various advanced technologies in the design and construction of its BTO (build-to-order) projects, Garden Waterfront I & II @ Tengah. The CTP, which is a partnership with construction firm Obayashi Singapore Pte Ltd, aims to realise a 25% improvement in site productivity, compared to other BTO projects.

The innovative technologies tested in Garden Waterfront I & II @ Tengah are expected to yield higher productivity through more efficient use of manpower and resources. These innovations will be studied for possible wider-scale implementation in future BTO developments.

AI in autonomous tower crane

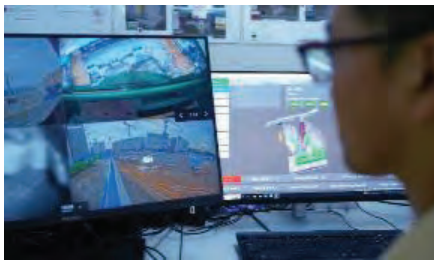
To enhance the efficiency, safety and precision of tower crane operations, AI is being used in the autonomous tower crane integrated with Skyjuster. AI helps to automate the lifting and transportation of precast components, and adjust the orientation of the suspended components mid-air for greater precision, which speeds up installation of precast components. This will enable HDB to build flats faster and safely, compared to traditional construction methods.

Before any on-site works begin, a comprehensive virtual design and construction model using building information modelling (BIM) is developed and seamlessly integrated with the autonomous tower crane. This information model (digital twin) specifies the placement of each precast component, before they are hoisted. The digital twin is continuously updated during the installation process to help the crane monitor live construction activity and maintain the required safety clearance from installed structures.

To initiate hoisting works, the operator only needs to touch a button in the cabin, then the crane autonomously lifts and transports precast units through the shortest safe route to their designated locations recorded in the BIM. This streamlined process reduces operator fatigue and enhances operational efficiency on-site.

The AI-powered autonomous tower crane with Skyjuster is seen here lifting and transporting a precast module.

The integration of the Skyjuster to the lifting frame helps eliminate swaying motions of the modules, and automate the rotation and positioning of suspended components to the intended alignment before they are lowered into place.



Before any on-site works begin, a digital twin is developed and integrated with the autonomous tower crane. It specifies the placement of each precast component before they are hoisted. The entire installation process from hoisting to final placement will be monitored live through the digital twin model remotely at the site office.

During the automated hoisting and placement, the crane operator also acts as a safety contingency, where they can manually override the movement of the tower crane should they notice any potential safety hazard.

The integration of the Skyjuster – which houses a gyroscope – to the lifting frame further enhances the crane system by eliminating swaying motions of the modules, and automating the rotation and positioning of suspended components to the intended alignment before they are lowered into place. It removes the need for manpower to provide manual rope guidance, and speeds up the construction process while enhancing overall safety, especially for large and heavy precast modules that require significant effort to manoeuvre.

The entire installation process from hoisting to final placement is monitored live through the digital twin model remotely at the site office, ensuring accurate and safe installation.

Crane machine guidance

Another innovation being piloted as part of CTP is the crane machine guidance technology, which is being used in mobile cranes for the construction of a multi-storey car park. The technology incorporates advanced safety features, thereby enabling two adjacent mobile cranes to operate safely and simultaneously within a confined space, with less manpower.

The GPS system on the mobile cranes defines each crane's specific operational zones to ensure their safe movement, and the sensors on the crane's boom provide alerts to the crane operator to ensure that safe distances between the cranes are maintained. Light Detection and Ranging (LiDAR) sensors on the boom also provide the crane operator with feedback on the vertical accuracy of the hoisted components and detect potential obstructions in the object's path, therefore facilitating precise and safe component installation without the need for an onsite spotter.

In addition, the crane machine guidance technology provides mobile crane operators with a birds' eye view of the construction area, eliminating the need for traditional walkie-talkie communication with workers to manoeuvre the boom, and enabling tasks to be carried out safely and with greater precision, in a shorter time.

Robots for painting and skimming

HDB has also announced that starting from next year, it will progressively expand the use of robots to carry out painting and skimming works across approximately half of new BTO construction sites, to enhance site productivity and deliver better homes.

With the rise of robotics, automation and artificial intelligence (AI), HDB has been collaborating with global research and industry partners, investing in research and development, and trialling new technologies to push the boundaries of construction productivity in public housing projects. A key focus area is leveraging robotics solutions and automation to streamline construction processes and achieve improvements in time savings, site productivity and safety.

To reduce reliance on manpower and increase construction efficiency amid a tight labour market in construction, HDB has conducted 10 on-site trials, involving construction robots in BTO projects, since 2023. These trials have provided insights on the technical efficacy and suitability of these solutions. For example, HDB piloted an architectural finishing robot at a site in Yishun North to help automate and speed up labour-intensive tasks such as skimming and painting of interior surfaces. The use of this robot on site has improved trade productivity by up to 30% (i.e. workers are producing up to 30% more physical output per hour).

Building on the positive outcomes of these trials, HDB will progressively expand the use of robots to carry out painting and skimming works in selected BTO projects from next year. These robots are equipped with various sensors that enable them to navigate narrow passageways during the construction phase and achieve precise targeting for painting and skimming tasks.

To assist contractors who are new to the adoption of robotics solutions, HDB will partner suppliers to offer robots with painting and skimming functions at competitive prices via a term contract. This will enable contractors to access these advanced technologies more affordably, and help contractors to accelerate the process of identifying, onboarding and deploying suitable robots at HDB sites. ■

With the crane machine guidance technology, two mobile cranes can be safely deployed side by side within a confined space.

An artist's impression of Garden Waterfront I & II @ Tengah. The technologies tested in this residential project will be studied for possible wider-scale implementation in future BTO developments.

All images: HDB

CALENDAR OF EVENTS

// Events in Asia

Smart Construction Expo
20 to 22 Nov 2024
Korea International Exhibition Centre
Goyang, South Korea
Website: www.smartconexpo.com/eng

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

bauma Conexpo India
11 to 14 Dec 2024
India Expo Centre
Greater Noida, India
Website: www.bcindia.com

BuildTech Asia
26 to 28 Mar 2025
Singapore Expo
Singapore
Website: www.buildtechasia.com

Geo Connect Asia
9 to 10 Apr 2025
Sands Expo and Convention Centre
Singapore
Website: www.geoconnectasia.com

Trenchless Asia
21 to 22 May 2025
Kuala Lumpur Convention Centre
Kuala Lumpur, Malaysia
Website: www.trenchlessasia.com

BEX Asia
3 to 5 Sept 2025
Sands Expo and Convention Centre
Singapore
Website: www.bex-asia.com

BCT Expo (Building Construction Technology Expo)
3 to 5 Sept 2025
Impact Exhibition and Convention Centre
Bangkok, Thailand
Website: www.bct-construction.com

Construction Indonesia
10 to 13 Sept 2025
Jakarta International Expo
Jakarta, Indonesia
Website: www.constructionindo.com

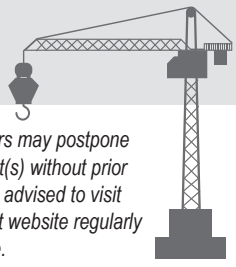
CBA Expo (ConsBuild Asia)
24 to 26 Sept 2025
Bangkok International Trade and Exhibition Centre
Bangkok, Thailand
Website: www.consbuildasia.com

Concrete Expo Asia
24 to 26 Sept 2025
Bangkok International Trade and Exhibition Centre
Bangkok, Thailand
Website: www.concrete-expoasia.com

// Events outside Asia

World of Concrete
21 to 23 Jan 2025
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 event(s) without prior notice. Readers are advised to visit the respective event website regularly for the latest update.*

Thailand's CBA Expo and Concrete Expo Asia 2024 conclude, drawing buyers from over 40 countries

The second edition of CBA Expo and the inaugural Concrete Expo Asia recently took place from 22 to 24 August 2024 at the Bangkok International Trade & Exhibition Centre (BITEC) in Bangkok, Thailand. The event featured various machines, equipment and technologies for the construction, building, concrete and mining industries.

According to the event's organiser, BMEX Ltd, both trade shows drew over 80 leading brands and companies from Thailand and abroad, including India, Austria, Switzerland, Germany, Russia, Malaysia, Singapore and China. The exhibitors also had the opportunity to meet with more than 2,500 trade buyers from over 40 countries, with a trading value of more than 80 million baht.

Speaking at the opening ceremony, Ekapat Wangsuwan, Deputy Permanent Secretary of Thailand's Ministry of Industry, said that CBA Expo and Concrete Expo Asia "will help the industrial sector as a whole. As a result, we have decided to support the event. Because the construction, building, concrete and mining industries are all part of the industrial supply chain, a strong Thai construction, building, concrete and mining industry will benefit other associated industries as well.

"Furthermore, one of the Ministry of Industry's responsibilities is to promote sustainable industrial development, which allows it to participate in the global market. We believe that introducing contemporary machinery, technology and innovation will significantly increase the potential of Thai entrepreneurs and the industrial sector. As a result, we believe that CBA Expo 2024 and Concrete Expo Asia 2024 are two events that will contribute to the realisation of our vision and goal."

Zoomlion Heavy Industry (Thailand) Co Ltd, one of the exhibitors, noted that the machinery and technology market in Southeast Asia is growing rapidly. Thailand has become a key hub due to its strong infrastructure and high-potential location, making it suitable for competing in markets. Advanced products such as electric machinery and the 5G tower crane remote intelligent control system, as well as the adoption of innovations, play a vital role in supporting the industry's infrastructure to effectively meet the changing market demands. The company also introduced its latest excavator model at the event.

Another exhibitor, Chairatchakarn (Bangkok) Co Ltd, showcased its Hino trucks and JCB machines. The company launched a new JCB 3CX backhoe loader at the event, which is designed to enhance efficiency while reducing costs and maximising long-term profits. Comprehensive services are also provided, including vehicle delivery, after-sales service, financing and accessories.

"We want CBA Expo and Concrete Expo Asia to be a business platform for entrepreneurs in the construction, building, concrete and mining industries to meet, talk, exchange experiences and get new business opportunities," said Paul Chantaratim, director of exhibition business and head of the event at BMEX Ltd.

CBA Expo and Concrete Expo Asia are planned to return on 24-26 September 2025 at BITEC in Bangkok. ■

Website: www.consbuildasia.com / www.concrete-expoasia.com

ALL IMAGES: **The second edition of CBA Expo and the inaugural Concrete Expo Asia have recently concluded, featuring 80 brands and companies from Thailand and abroad. The event also drew more than 2,500 trade buyers from over 40 countries.**

bauma Conexpo India returns on 11-14 Dec 2024

The construction equipment industry in India is on the upswing, driven by several factors such as rapid infrastructure development, mining and urbanisation. bauma Conexpo India will bring together all these demand and supply-side forces at the India Expo Mart, Greater Noida, Delhi NCR, from 11 to 14 December 2024.

In 2024, India's construction and mining equipment industry witnessed a 26% year-on-year growth in equipment sales, including strong demand from export markets. This growth trajectory presents a significant opportunity for innovation and product diversification not only for Indian manufacturers but also for companies from around the world, and poses certain challenges in terms of building a thriving ecosystem of component suppliers, skilled service providers and future-ready R&D capabilities.

As a result, bauma Conexpo India is deepening relationships and expanding networks with national and international equipment manufacturers and construction associations. Some of the key partnerships in the country include the Indian Construction Equipment Manufacturers Association (ICEMA), Builders Association of India (BAI), Construction Equipment Rental Association (CERA), Committee for European Construction Equipment (CECE), Spanish Manufacturers Association of Construction and Mining Equipment (ANMOPYC), Cranes Owners Association of India (COAOI), Construction Federation of India (CFI) and more.

Growing international participation

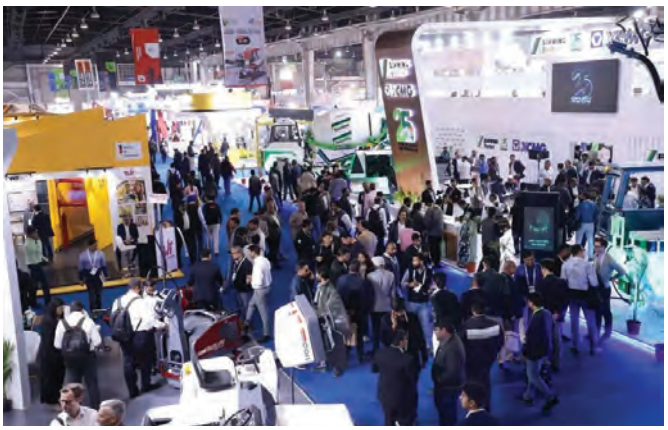
As an integral part of the global network of bauma trade fairs in Europe, Asia and Latin America, bauma Conexpo India has become an important platform for buyers and suppliers, offering next-generation construction technologies in action, insightful conferences, buyer-seller meetings, interaction with key government decision-makers, a live demo area, award ceremonies and networking events, among others.

Attracted by India's strong infrastructure growth potential, the upcoming edition will see greater global participation with over 800 Indian and international exhibitors across 135,000 sq m of exhibition space and more than 75,000 trade visitors expected from over 100 countries.

Digital technologies like AI, IoT and automation are transforming every industry, and construction equipment is on the cusp of adopting these disruptive, transformative technologies. However, technical partnerships between equipment users and manufacturers are crucial for innovative technologies to be developed, priced right and delivered to the most remote regions of the country.

With that in mind, bauma Conexpo India 2024 will launch a series of more than 30 conferences and technical sessions, including the Quarry Forward conference. These conferences will focus on a range of topics such as equipment finance, telematics, automation, AI/IoT, skills development and sustainability, to name a few. ■

Website: https://bcindia.com/en



ALL IMAGES: **bauma Conexpo India will see greater global participation with over 800 Indian and international exhibitors across 135,000 sq m of exhibition space and more than 75,000 trade visitors expected from over 100 countries.**

BCT Expo 2024: 'The Construction Meeting Place' in Southeast Asia

Building Construction Technology Expo (BCT Expo) 2024 recently concluded, featuring 150 exhibiting companies and brands from 16 countries, with over 3,879 industry visitors from 35 countries. Themed 'The Construction Meeting Place', the event returned to the Impact Exhibition and Convention Centre in Bangkok, Thailand from 18 to 20 September.

This year's BCT Expo presented a comprehensive range of machinery, equipment, tools, technologies, materials and solutions across 10 clusters – ranging from earthmoving and demolition, lifting and handling, road construction, concrete and cement, materials, tools and equipment, digital construction, AI & robotics, construction services to smart facility management.

Prior to the start of the event, a special 'International – Thai Construction Networking Cruise Night' along the Chao Phraya River was arranged to provide a river cruise networking experience, drawing participants from both Thailand and abroad.

Apart from the exhibition, BCT Expo 2024 also organised a series of conferences, where over 30 industry experts from various international and local organisations shared their insights on emerging trends, technologies and sustainability. Some of these conference topics included AI & Robotics, Future of Construction Equipment, Green Construction Transition, Drones Applications, BIM, and Smart Facility Management.

Another key highlight of BCT Expo 2024 was its 'business-matching programme', which saw over 520 pre-arranged business meetings between pre-qualified hosted buyers and exhibitors. This programme allowed the exhibitors to pre-schedule one-to-one meetings with their targeted key buyers.

BCT Expo aims to facilitate growth for the AEC (architecture, engineering and construction) industry, not just in Thailand but also in the Southeast Asian region. The event provides a dynamic face-to-face platform for suppliers, trade visitors and buyers to network, exchange views, update on latest trends, and forge new business deals and opportunities.

Andrea Bertelli, area manager of Poggi SpA from Italy, said, "We supply silos for construction and reclaiming system for water treatment. We are pleased with the new business connections that we made during BCT Expo. The business matching programme was well organised and we are indeed satisfied with the overall arrangements of BCT Expo."

Kannapak Taweeyos, business development manager of Channakorn Engineering Co Ltd, added, "We are into designing and construction of warehouses and factory buildings. This year marks our third year of participation at BCT Expo and the numbers and quality of attendees that we meet during the event make it a worthwhile marketing investment for us to continue to join BCT Expo."

The next edition of BCT Expo is scheduled to be held from 3 to 5 September 2025 at the Impact Exhibition and Convention Centre. ■

Website: www.bct-construction.com

ALL IMAGES: **This year's BCT Expo drew 150 exhibiting companies and brands from 16 countries, with over 3,879 industry visitors from 35 countries. Themed 'The Construction Meeting Place', the event returned to the Impact Exhibition and Convention Centre in Bangkok, Thailand from 18 to 20 September.**

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Entries now open for IAPAs 2025

The International Awards for Powered Access (IAPAs) 2025 are now open for entries, and bookings are also available for the IPAF Summit. Taking place in Dublin, Ireland on 13 March 2025, the IAPAs celebrate excellence in the powered access industry.

There are 13 award categories covering the usual range of new products, innovations, sustainability, safety, and equality and diversity in the workplace. Winners will be selected by an independent judging panel of five longstanding industry experts.

Organised by the International Powered Access Federation (IPAF) and Access International, the IAPA ceremony will be held on the same day as the IPAF Summit, which offers top-level presentations, topical industry discussions,

and networking opportunities across both events.

IAPA 2025 categories:
- Access Rental Company of the Year
- The Sustainability Award
- The EDI Award
- Contribution to Safe Working at Height
- Innovative Technology Prize
- Digital Development Award

Lifetime achievement:
- IPAF/Access International Lifetime Achievement Award

Product awards:
- Product of the Year – Mast Climbing Work Platforms & Hoists
- Product of the Year – Scissor Lifts & Vertical Mast Platforms
- Product of the Year – Self-Propelled Booms & Atrium Lifts
- Product of the Year – Vehicle and Trailer Mounted

IPAF member companies and individuals only:
- IPAF Training Instructor of the Year
- IPAF Training Centre of the Year.

The deadline for submitting entries is Monday, 2 December 2024. ■

Website: www.iapa-summit.info/awards2025

IPAF names new chair of MCWP & hoist international committee

The International Powered Access Federation (IPAF) has appointed Cameron Reid (pictured) as the new chair of the mast climbing work platforms (MCWP) & hoist international committee. In his new role, Mr Reid will lead IPAF's mission to promote the safe and effective use of MCWPs and construction hoists worldwide through technical expertise, guidance and training to meet industry standards and regulations.

Angel Ibanez, IPAF's MCWP and hoist manager, and convenor of the international committee, said, "With Cameron stepping in as the new chair, the international committee is set to enhance its efforts to truly represent the voice of this industry on a global scale. Cameron's extensive professional experience will undoubtedly enable him to carry on the outstanding work achieved by his predecessor, Kevin O'Shea, while injecting fresh momentum with the full support of the IPAF team."

As chair, Mr Reid's main objectives are to expand training and certification programmes for MCWP and hoist instructors, broaden the reach of IPAF's training centres globally, and enhance membership. He is focused on reinforcing IPAF's core values of safety and operational excellence by ensuring that all users have access to the latest training and resources.

"The expansion of safe and effective use of MCWPs and construction hoists is critical as demand grows worldwide," said Mr Reid. "Our committee is focused on increasing the number of certified instructors and training centres globally, strengthening our training programmes, and continuously promoting best practices. By expanding our reach and resources, we aim to ensure the highest safety standards across the industry and reinforce IPAF's commitment to operational excellence."

Mr Reid recognises that the MCWP and hoist sector is set to evolve significantly, with safety and technological innovation at the forefront. His vision for the future includes:

- Enhanced safety through digital tools: Real-time monitoring using IoT technology will provide operators with data on key factors such as safe working load (SWL) limits, wind conditions and equipment status. This technology, along with automatic alerts for untrained operators or overdue maintenance checks, has the potential to reduce accidents and ensure safer operations.
- Advances in materials and modular designs: Innovations in materials are leading to stronger, lighter and more adaptable machines. Modular designs will allow for quicker assembly and disassembly, making MCWPs and hoists more adaptable to a variety of project needs while improving both efficiency and safety on site.
- Commitment to sustainability: With sustainability becoming a priority in construction, Mr Reid supports a shift towards energy-efficient designs and recyclable materials. He believes this focus on reducing environmental impact will drive the sector forward as the industry adopts greener practices.

With the advancement of equipment, Mr Reid stresses the importance of comprehensive training for all professionals working with MCWPs and hoists. He plans to prioritise initiatives that keep pace with technological changes and supports consistent global standards to promote safe and efficient operations across all regions. He notes that regulatory variations and inconsistent procedures are challenges, but he is committed to providing guidance and resources to help the industry meet high standards consistently.

"Regular inspections, rigorous maintenance and clear compliance with local and national standards are fundamental for a safer industry," said Mr Reid. "Our committee will actively work to provide guidance and resources that support these standards." ■

Liebherr introduces 440 HC-L luffing jib crane

Liebherr's new 440 HC-L luffing jib crane is a response to ever-faster construction site cycles. Compared to its predecessor, the 357 HC-L, the new model comes with improved performance values and is available in two versions: the 440 HC-L 12/24 and the 18/36. The maximum lifting capacity of the 440 HC-L 18/36 has increased from 32 to 36 t. It has also been possible to raise the tower height of both crane versions by one tower section compared to the previous model.

The new 440 HC-L requires very little space for a crane of its size, featuring an out-of-service position of up to 10.7 m and a minimum working radius of less than 4 m. This means that the crane can be set up closer to buildings, property boundaries or another luffing jib crane, which makes site planning easier. Depending on the situation, the out-of-service position makes it possible to accommodate and operate an additional crane on site.

This is the first time aramid fibre guying is being used for a luffing jib crane, revealed Liebherr. The lightweight material reduces weight on the jib, resulting in a higher lifting capacity. Significant weight is saved compared to the use of steel ropes; dead load can consequently be transformed into load capacity. An aramid fibre guying system also offers advantages for crane assembly and disassembly owing to its lighter weight. Aramid fibre has already proven itself and become an established material with other Liebherr cranes, including crawler and maritime cranes.

The 440 HC-L only requires one central switchgear cabinet. Electronic components are arranged in a plug-and-play set-up, which significantly reduces assembly time. The crane is also available with Liebherr's drives and the latest TC-OS control unit for simple operation.

Assemblies are pre-assembled at the factory prior to the crane being delivered, thereby optimising transport costs and enabling the crane to be unloaded more quickly on site. The counter-jib ballast, which consists of a single block, also contributes to faster assembly and disassembly. Only nine transport units are needed for the slewing section at full jib length, including its counter-ballast.

The 440 HC-L's maximum radius has increased to 65 m and its jib head lifting capacity by up to 52%. The jib can be extended in 5 m increments. Thanks to Load Plus, performance can be increased by up to 22% at the touch of a button. With a 50-m jib, for example, the maximum jib head lifting capacity increases from 7.5 to 9 t. Tower heights have also been significantly improved: the free-standing height has been increased by up to 5.8 m, and the maximum assembly height (free-standing) measures in at up to 76.4 m. This makes planning climbing steps more flexible. ■

Website: www.liebherr.com

The new Liebherr 440 HC-L is capable of lifting up to 36 t.

This new luffing jib crane has an out-of-service position of less than 11 m.

New Hamm 25-t compactor for Tier 3 markets can crush and compact in single step

The new Hamm HC 250 C VC compactor is targeted at Tier 3 markets. Designed with a vibration crusher (VC) drum, the machine can crush and compact rocks and stone in a single work step, providing many benefits for the users. Jobs on the construction site can now be streamlined by deploying VC compactors, since these reduce the process and expense needed for material preparation and transport. As a result, time, costs and CO2 emissions are cut by up to 50% – depending on the application.

The HC 250 C VC is able to crush and compact mixed soils, in addition to stones such as basalt and granite, in a single work step. Featuring a 150 kW Deutz engine and reinforced components, the new compactor is well-equipped for particularly tough applications. The addition of the 'C' in the type designation also symbolises a reinforced drum drive, capable of inclines of up to 60%. The machine is supplied as standard with heavy-duty tyres for rocky terrain, driver's cab and the Easy Drive operating concept. An air-sprung driver's seat can be selected as an optional extra.

One of the highlights is the newly designed tool holder system, which is compatible with round-shank cutting tools for soft stone, as well as heavy-duty cutting tools with carbide tips and hard facing for abrasive stone or hard stone. This ensures assembly and removal are quick and easy with no need for specialist tools, which in turn keeps maintenance and servicing costs down. Existing models (including the H 25i VC or 3625 VC) can be fitted with the new-design tool holder system by changing the drum.

Hamm's new VC compactors are suitable for a wide range of applications, including crushing and compacting geological material or working with rubble in landfill sites. They can also be used for road planing works in tunnel building and surface mining sectors, or to pre-crush and loosen stone. This takes a lot of hard work out of subsequent processes, such as layer-by-layer milling of. ■

Website: www.wirtgen.com

The VC compactors from Hamm are compatible with attachments including round-shank cutting tools for stone and heavy-duty cutting tools. Thanks to the simple design, no specialist tools are required to change the attachments.

Hamm presents its new HC 250 C VC compactor, ideal for Tier 3 markets. The machine is equipped with a vibration crusher (VC) drum that allows it to crush and compact in a single work step.

Haulotte's new HS18 E MAX electric scissor lift can drive at full height

Haulotte has introduced its new HS18 E MAX, the latest model in the company's Pulseo electric rough-terrain scissor lift range. It completes the existing HSE series, which includes the HS15 E, HS15 E PRO, HS18 E and HS18 E PRO. The new HS18 E MAX stands out with its ability to drive at full height (with a full load), reaching up to 18 m.

According to Haulotte, the HS18 E MAX is one of the first 18-m electric rough-terrain scissor lifts on the market that can drive at full height. This minimises the need for repeated trips to the ground, resulting in higher efficiency on the jobsite and improved battery longevity. The machine is suitable for both indoor and outdoor applications.

The ability to drive at full height also provides major benefits in productivity, especially for tasks such as the installation of HVAC, fires sprinkler, electrical pipes, or cables, allowing operators to move effortlessly around their work area and reducing the need to manoeuvre up and down.

The Pulseo scissor lifts, including the HS18 E MAX, boast a fully electric design. They feature the same drive performance as a diesel machine while being silent and environment-friendly. This makes them suitable for use throughout the entire construction project, from start to finish.

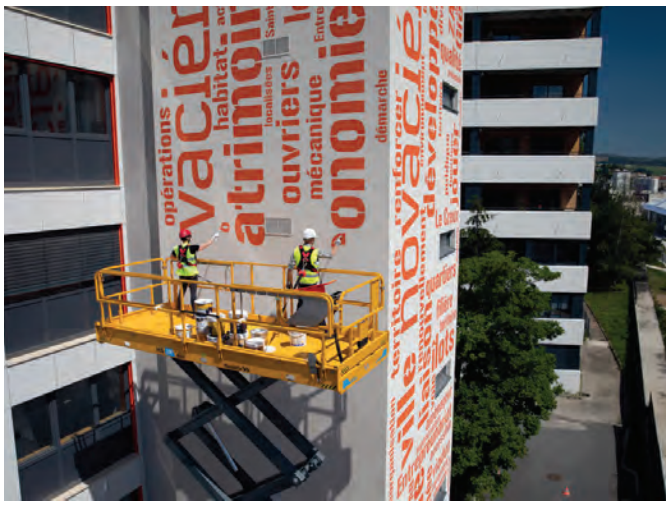
The HS18 E MAX's mechanical axle transmission and four-wheel drive deliver excellent power and rough-terrain performance. The machine's ability to drive at full height enables operators to cover large work areas efficiently with a load capacity of up to 750 kg even at full height.

In addition, there is a material handling rack option to help improve work efficiency. Ideal for applications requiring the transport of heavy loads (with a load capacity of up to 400 kg), this versatile and easy-to-install attachment offers a productive and safe solution. It keeps materials organised and minimises the risk of tripping. Two configurations are available to suit the materials being transported: panels or pipes. ■

Website: www.haulotte.com

The new HS18 E MAX scissor lift is suitable for both indoor and outdoor applications.

The HS18 E MAX is a new addition to Haulotte's Pulseo electric rough-terrain scissor lift range.



The HS18 E MAX scissor lift can drive at full height (with a full load), reaching up to 18 m.

Bentley unveils generative AI game-changer for civil site design

Bentley Systems has unveiled new generative AI capabilities for civil site design, including a design copilot, site layout optimisations, and automated drawing production that will drive new levels of productivity and accuracy.

Building on its success in applying AI-powered digital twins to asset maintenance – to detect and assess problems before failures occur – Bentley is bringing AI to the design phase of the infrastructure lifecycle to automate repetitive tasks, such as drawing production, so that engineers can focus on higher-value activities.

Leveraging generative AI

OpenSite+ is Bentley's first engineering application leveraging generative AI for civil site design. It helps engineers swiftly design residential, commercial and industrial sites with AI tools, significantly boosting productivity and accuracy.

A digital twin-native product, built with Bentley's iTwin platform, OpenSite+ delivers AI-powered efficiencies and better-quality designs with:

A). Enhanced design experience with copilot

Users can quickly create, revise and interact with requirements documentation and 3D site models through natural language interactions – to automatically make real-time design changes with precision and ease.

B). Layout optimisation

Users can enhance efficiency, reduce errors and rework site designs in minutes with one-click earthwork optimisation. Bentley's AI-powered design layout agent can evaluate thousands of layout options and suggest alternative designs in real-time, helping users make better design decisions sooner, saving time and money.

C). Automated drawing production

Users can reduce time spent on mundane drawing tasks, accelerating drawing production by up to 10 times, and improve drawing accuracy using AI-powered annotation, labelling and sheeting that automatically places labels and dimensions according to organisational standards that are optimised for legibility and aesthetics.

D). Smart design tools

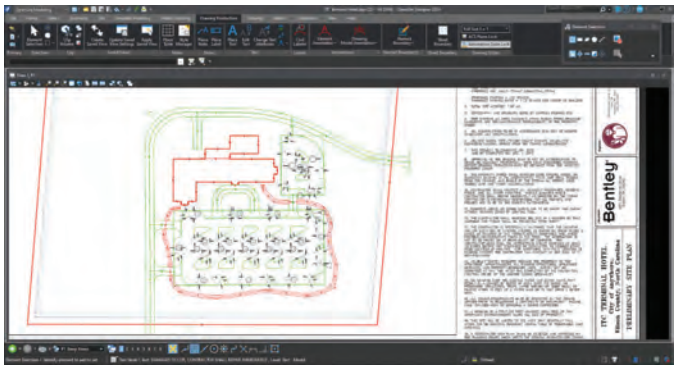
Users can create and revise designs using intelligent, editable objects such as building pads, parking layouts, driveways, sidewalks and ponds to complete projects in a fraction of time compared to traditional CAD software.

With OpenSite+, users also maintain control over their proprietary data during AI training, which creates a solid foundation to responsibly guide the development of AI models.

"By leveraging their past data to optimise future work, generative AI will revolutionise infrastructure design, improving engineers' productivity and accuracy without sacrificing on quality," said Mike Campbell, chief product officer at Bentley Systems. "OpenSite+ is just the first example of how Bentley is applying generative AI to benefit infrastructure design and project delivery."

OpenSite+ early adopter, Joe Viscuso, senior vice president and director of strategic growth at US engineering company Pennoni, commented, "OpenSite+ is a game-changer. By combining design and routine tasks into one powerful platform, it eliminates the need to switch between multiple programmes. It streamlines our workflow, automates repetitive tasks, and ensures accuracy as we make changes in real-time. This means faster project completion with superior results, helping Pennoni stay ahead of the curve in both technology and innovation."

Bentley introduced its OpenSite+ application to the global audience on 9 October, during the company's Year In Infrastructure 2024 event in Vancouver, Canada.



Bentley's OpenSite+ software uses AI to automate annotation and plan production for civil site design. It can deliver optimised, accurate site designs up to 10 times faster than traditional methods.

All images: Bentley Systems

The OpenSite+ software with copilot uses organisation-specific documents and design models for quick insights and edits.

OpenSite+ is the first of a new generation of Bentley Open Applications which run on desktops for optimal responsiveness, while offering the benefits of cloud-based applications, such as automatic updates and cross-operating system availability. The iTwin-native architecture enables seamless collaboration and data-centric workflows. Data is saved directly in a digital twin, which in turn can include data from other sources to provide full context for design work.

According to Bentley, site engineering firms in North America are currently able to apply for early access. ■

Website: www.bentley.com

JTC adopts 360° reality capture technology to advance productivity, safety and quality in Singapore construction projects

JTC can now halve the time needed to track and document construction progress on its projects, thanks to the adoption of 360° reality capture technology. ***SEAC*** finds out more about this digital solution and the benefits it brings to the industry.

As the government agency in charge of Singapore's industrial development, JTC is setting the pace for digital transformation in the construction industry with the adoption of advanced technologies. One such innovation is a 360° reality capture solution to be employed in more than 30 JTC developments and JTC-managed public infrastructure projects.

This initiative, in collaboration with US-based technology provider OpenSpace and its local partners Ace Peripheral and Asia Infrastructure Solutions, was rolled out in March 2024. The innovative system uses 360° photogrammetry technology to document changes at project sites, instead of taking still photos and manually uploading them.

Additionally, the system's integration with JTC's connected data environment – called 'Optimus' – allows data from the technology to be tapped to improve project quality and safety.

According to John Kiong, director, Future of Building and Infrastructure Division at JTC, the system is available to all parties in the value chain – from project managers and consultants to

LEFT: **A project manager inspects the construction progress at Punggol Digital District – one of JTC's major mixed-use developments in Singapore – using a 360° camera (mounted on his hard hat) that captures the entire surroundings and details around them.**

ABOVE: **The 360° reality capture solution is equipped with computer vision and AI to automatically pin photo captures to floor plans, providing project management staff with an easy and intuitive way to visualise and document construction progress in real time.**

contractors and subcontractors. Although the 360° reality capture solution is intuitive to use, training is provided to all users via onboarding training sessions, manuals, refresher courses, periodic clinic sessions and WhatsApp support. By rolling out the solution across its value chain, JTC aims to reduce adoption barriers and foster industry-wide productivity gains.

Mr Kiong shared some of the projects where JTC and its partners have used the 360° reality capture technology. These include:

• Construction of Punggol Digital District. Project staff used the technology for site progress update, general communication of site status and virtual TOP (Temporary Occupation Permit) inspection.

• Demolition works for Toa Payoh Integrated Development. Site staff used the technology for safety observations and progress tracking.

• Construction of Loyang North Substation. Project managers used the technology for progress tracking and safety monitoring.

• Addition and alteration (A&A) works for a flatted factory at 28 Ayer Rajah Crescent. Site staff used the technology for progress tracking.

• Phase 1 infrastructure works for Jurong Innovation District. The project team used the technology for virtual TOP inspection.

• Road handover to LTA (Land Transport Authority). Project managers used the technology to conduct virtual inspection of 13 roads prior to their handover to LTA.

Significant improvements

Historically, documenting site progress through photography has been a tedious and time-consuming task. In contrast, the new system involves affixing a small 360° camera to the hard hat worn by staff, enabling seamless capture of the entire surroundings and every detail during a site walk. The resulting 360° photos are then uploaded to a web platform, which will be immediately accessible to all parties in the project's value chain.

Moreover, the system is equipped with computer vision and artificial intelligence (AI) to automatically pin photo captures to floor plans, providing project management staff with an easy and intuitive way to visualise and document construction progress in real time. The platform's

ABOVE: **John Kiong, director, Future of Building and Infrastructure Division at JTC, spoke to SEAC about the benefits of 360° reality capture technology.**

BELOW: **Project managers at Punggol Digital District use a web platform to access the 360° photos, allowing them to compare with past site captures and validate the as-built structures with the original design.**

timeline feature allows side-by-side comparison of 360° photos of the same location to track its progress.

Prior to implementing the technology, JTC conducted several trials and the results showed significant efficiency gains. Project teams saw a 60% reduction in time for site data collection and documentation, and a 50% decrease in time for data search, progress tracking and analysis. Furthermore, the system enabled time savings for site discussions of about 40% and a further 75% reduction in time for monthly site walks, primarily due to the elimination of travel to and from the site.

These savings underscore the transformative impact of the new system on project management, said Mr Kiong. The adoption also addresses the challenges in the construction industry such as a dwindling workforce and increasing competition for skilled labour.

JTC is currently tracking the performance of the system following its implementation in March. "So far, it has met expectations in automating time-consuming and manual tasks in site progress updates, communication of site status, as well as in virtual TOP inspections. This enables users to concentrate on higher-level work that brings greater value to construction projects or developments, such as problem-solving and more accurate planning," said Mr Kiong.

Digital future

Apart from reality capture technology, JTC has embraced robotic solutions to boost site productivity, safety and quality on its projects. For example, at JTC's Bulim Square facility in the Jurong Innovation District, its contractor Great Resources (M&E) Contractor Pte Ltd has deployed a drilling and anchoring robot for prefab MEP (mechanical, electrical and plumbing) installation works where the ceiling was more than 4.8 m high.

"We were able to achieve a 40% reduction in labour costs as fewer workers are needed for drilling tasks. Drilling times have also been reduced by 50%, shortening project timelines and increasing overall productivity. More importantly, there are fewer work-at-height risks and less worker fatigue," said Mr Kiong.

To help inspectors spot and report defects in roadside infrastructure within JTC's industrial estates, JTC has also implemented an automated estate inspection system in estates in Singapore. The system taps AI and real-time machine vision to inspect defects on road surfaces

A training session on 360° reality capture for JTC project managers. Although this system is intuitive to use, training is provided to all users via onboarding training sessions, manuals, refresher courses, periodic clinic sessions and WhatsApp support.

ABOVE AND LEFT: **Training sessions on 360° reality capture for contractors and site supervision staff. The system is available to all parties in the project's value chain. By doing this, JTC aims to reduce adoption barriers and foster industry-wide productivity gains.**

and other roadside infrastructure in the estate. Inspectors perform estate inspections by mounting a smartphone with a full HD camera on a vehicle driven at a normal speed. The footage captured is uploaded and processed by an AI system hosted in the backend server, which identifies the defects and their location, grades their severity, and highlights those in need of repair. After the drive-through, the inspectors can verify the defects highlighted, and the system instantaneously generates a report with the details of the defects to facility managers for their action, streamlining the previous workflow where the latter had to wait at least a few days for the report.

Mr Kiong said the system can complete inspections in 60 minutes compared to the past where a manual inspection can take up to two days. "The extensive training of the AI models also allows a high accuracy rate of 90% to be achieved for estate inspections at one-north, and by using a slightly higher-end smartphone, the system can operate in low-light settings, providing the opportunity for night-time inspections," he added.

Moving forward, JTC aims to drive innovation in the construction industry by piloting new technologies and playing a key role in facilitating change and encouraging its value chain partners to get on board with digital transformation.

With its role as the public sector's Centre of Excellence for building and infrastructure projects, JTC is committed to driving productivity improvements in the construction industry through technology adoption and scaling up best practices. However, Mr Kiong assured that any new technology will be shared and encouraged among the industry. "As with the reality capture solution, by availing the [digital] platforms for our project managers and partners' use, we allow them to see the benefits in improving productivity, reducing manpower on site, and reducing cost from delay and reworks. They will then be less hesitant to start using it in other projects," he said. ■

Website: www.jtc.gov.sg

RIGHT: **Apart from reality capture technology, JTC has also embraced robotic solutions to boost site productivity, safety and quality. For example, at JTC's Bulim Square facility, its contractor deployed a drilling and anchoring robot (pictured) for prefab MEP installation works where the ceiling was more than 4.8 m high.**

All images: JTC

OVERCOMING CHALLENGES IN SINGAPORE RAIL PROJECT

Forging part of Singapore's seventh MRT line, Doka's planning, assembly, supervision and installation are helping to keep the Jurong Region Line (JRL) on schedule for delivery in January 2025.

Doka Singapore is past the halfway point for its work on three stations and a viaduct on Singapore's seventh MRT line. The stations, which include Toh Guan (JE4), Jurong Town Hall and Pandan Reservoir, are part of a wider US$515 million project that involves the design, site supervision, assembly and installation of Doka's proposed solution.

Once complete, the JRL network will significantly improve the connectivity and development of the area, which is set to become the largest commercial hub outside of the central business district. As a result, commuters can expect to be connected to key activity nodes, such as the Jurong Industrial Estate, Jurong Innovation District and the Nanyang Technological University (NTU).

Working with joint venture main contractors, Daewoo-Yongnam, and subcontractor, SAE&C, Doka faced numerous logistical challenges, given the project site's heavily built-up area, live traffic from the four-lane Jurong East Central Road, and its proximity to an existing MRT line. With the Toh Guan Station requiring 10 cross-heads spanning the highway, Doka's first challenge was to deliver a solution that allowed the cross-head installation to proceed without interfering with the traffic below.

By assembling a Steel Girder Formwork system 3 km away offsite, the Doka team was able to complete the majority of the work away from the jobsite before installing the system in combination with its heavy-duty shoring system UniKit via truck and crane, resulting in just one overnight road closure. Serving the dual purpose of truss support and wall formwork, the Steel Girder Formwork also ensured a minimal footprint as the formwork was only supported at the centre area around the column.

By leveraging Doka's offsite prefabrication solution, the core elements of the Toh Guan Station were delivered and constructed over the course of one night.

Complete with integrated walkways on both UniKit shoring towers and the Steel Girder Formwork, Doka ensured the safety of site teams throughout the project. Aside from completing the work with minimal disruption, this was also the first time Doka's Steel Girder Formwork system had been used outside of North America and the first time UniKit had been used in Singapore.

"Finding a solution that took into account the project's various challenges was going to be difficult, particularly considering its busy location; however, by leveraging the extensive benefits of our offsite prefabrication and working in close collaboration with our partners, we were able to deliver the project specifications within minimal disruption to the location community, while ensuring site safety remained a priority at all times," said Boon Chun Wui, senior sales manager at Doka Singapore.

Having started the project in February 2024, Doka's portion of the project is expected to be handed over by January 2025. Upon completion, the JRL will connect more than 60,000 households in the Jurong area within a 10-minute walk from a train station, while its three interchange stations will enhance connectivity to the existing rail network. ■

Website: www.doka.com/ea/index

All images: Doka

ABOVE: **Following just one night of road closures, Doka's Steel Girder Formwork and UniKit shoring tower ensured a key stage of the Toh Guan Station was completed on time and on budget.**

BELOW: **Doka's solution included crane-lifting its Steel Girder Formwork at night to avoid disruption to existing infrastructure.**

2nd Edition

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On top of the world

Powerscreen has recently completed the installation and operation of its equipment in Ladakh, northern India – one of the world's most challenging environments.

A Powerscreen PT400X jaw crusher, 1000 Maxtrak cone crusher and Chieftain 1700 screen were commissioned to work on a Border Roads Organisation (BRO) project near Demchok, close to the China border, at Umling La, Leh Ladakh (UT). At an altitude of 19,024 ft, this project is at the world's highest motorable pass and aims to produce road construction materials such as granular sub base (GSB), wet mix macadam (WMM) and aggregates (5 mm, 10 mm, 20 mm).

The site's high altitude presented significant challenges due to low oxygen levels and temperatures, which dropped to -23°C during the project. Additionally, the terrain was hilly with sharp bends and no feasible roads, complicating the transportation and installation of the equipment onsite.

Powerscreen equipment is suitable for extreme climatic conditions due to its robust engineering and advanced technology, reinforced by rigorous testing and quality materials to withstand harsh environments – including high-altitude conditions. Additionally, the design of the equipment allows for dismantling and reassembly, facilitating transportation and installation in rough, inaccessible terrains. To navigate the rough terrain, the service team dismantled the Powerscreen equipment for transport and reassembled it on site. Despite the extreme conditions, the service team completed the installation and commissioning in 15 days.

The Powerscreen PT400X jaw crusher has been set up as the primary crusher and takes large and variable sized feed material to be fed into the 1000 Maxtrak cone crusher, which uses Automax crusher technology to provide high volumes of excellently shaped, consistent product. This material is then screened by the Chieftain 1700 screen to separate the product into its various sizes.

The successful deployment of Powerscreen equipment at Umling La has enabled the BRO to produce the necessary materials for its road project, ensuring the continuation of vital infrastructure development in the region. The infrastructure will improve access to remote villages, making it easier for residents to travel for medical care, education and other essential services.

Furthermore, the road will facilitate the delivery of goods and services, contributing to the overall socio-economic

LEFT: **At an altitude of 19,024 ft, this project is at the world's highest motorable pass and aims to produce road construction materials such as granular sub base (GSB), wet mix macadam (WMM) and aggregates (5 mm, 10 mm, 20 mm).**

BELOW: **To navigate the rough terrain, the service team dismantled the Powerscreen equipment for transport and reassembled it on site.**

BOTTOM: **The successful deployment of Powerscreen equipment at Umling La has enabled the BRO to produce the necessary materials for its road project, ensuring the continuation of vital infrastructure development in the region.**

development of the region. The enhanced connectivity also boosts local businesses and tourism, with many tourists attracted by the world's highest motorable road providing new income opportunities for locals through homestays, guided tours and local crafts.

"This project underscores Powerscreen's commitment to delivering high-performance solutions in the most challenging environments," said Ranga Swamy, director – customer and product support. "We are incredibly proud of our service team's exceptional efforts and resilience in overcoming the extreme conditions at Umling La. Their dedication and technical expertise were crucial in achieving this high-altitude installation." ■

Website: www.powerscreen.com

Part 2

ADVANCING TECHNOLOGIES **THE SPANISH WAY**

***SEAC* recently joined a press tour in Spain – organised by ANMOPYC (the Spanish Manufacturers Association of Construction and Mining Equipment) in collaboration with ICEX (the Spanish Institute for Foreign Trade) – to meet with several Spanish equipment manufacturers and take a closer look at their innovations, as well as learn more about their global activities and future plans, especially in the Asian region.**

SOLINTAL: INNOVATIVE COMPONENTS AND ATTACHMENTS FOR GLOBAL OEMs

Solintal specialises in the design and manufacture of various equipment and accessories for global OEMs (original equipment manufacturers). These include buckets, attachments, side frames, dump bodies, undercarriages, etc. for a wide range of machines like wheel loaders, backhoe loaders, dozers, dump trucks, and many more.

Established in 1962, Solintal is headquartered in Madrid, Spain – the site includes its manufacturing plant – and employs over 250 people globally. The company's main business sectors are mining, construction, railway and defence, but it is also involved in the energy, dredging and other industrial sectors.

According to Solintal, it is currently working with four major OEMs (Liebherr, Hitachi, Komatsu and Caterpillar). For the construction sector, the company produces different types of buckets and attachments such as booms and arms, rippers, and bumper beams, to name just a few.

Solintal is active around the world, with presence in five continents. In Asia, it has "a portfolio of customers and partnerships that are part of our network in this market," the company told SEAC at a recent press event.

"Specifically in Asia, we rely on the metal fabrication sector, both for the contribution of the design and for the implementation of the design (in its entirety) on our part," said Solintal. "In this context, we are a leading engineering company that deals with the design and development of a wide range of initiatives in the field of mining and construction, as well as metal fabrication as a whole."

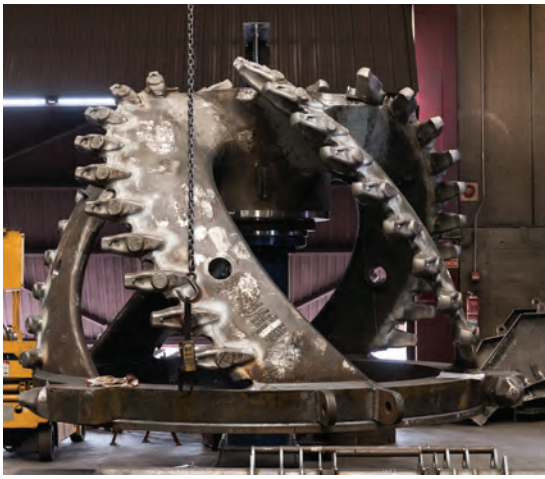
Solintal added that in Asia, the company is also working with a number of potential and internationally recognised customers in the defence sector, carrying out the delivery of implements for military vehicles.

Furthermore, Solintal conducts separate activities through its business unit Mecanización y Minería, S.A (MYMSA). The company specialises in the distribution, manufacture and repair of machinery, components and tools for the drilling sector, as well as indoor mining machinery and equipment, and underground works such as tunnels, electrohydraulic plants and underground tanks.

Solintal's Rafael Chavarri, CEO (left) and Daniel Chavarri, director of operations, provided an overview of the company's operations during a recent press event.

MYMSA provides on-site assistance and maintenance services, plus mechanical, electrical and hydraulic assembly services. The company serves as an official distributor in the Spanish market for a number of well-known global equipment manufacturers, including Casagandre (drilling and foundation equipment), Hütte (foundation equipment), Kennametal (tooling and industrial materials), Häny (grouting systems), Bulroc (DTH rock drilling equipment), and ThyssenKrupp (industrial engineering and steel production), among others. ■

Website: www.solintal.com



ABOVE, LEFT, BELOW AND BELOW LEFT:
Solintal specialises in the design and manufacture of various equipment and accessories for global OEMs. These include buckets, attachments, side frames, dump bodies, undercarriages, etc. for a wide range of machines like wheel loaders, backhoe loaders, dozers, dump trucks, and many more.

BELOW (LEFT AND RIGHT): **Headquartered in Madrid, Spain, Solintal is active around the world, with presence in five continents. The company's main business sectors are mining, construction, railway and defence, but it is also involved in the energy, dredging and other industrial sectors.**

ULMA: 'SOUTHEAST ASIA IS A GROWING MARKET FOR US'

Global manufacturer ULMA Construction offers comprehensive formwork and scaffolding solutions for the construction industry. The products are used in a wide range of applications, including building, civil engineering, industrial and restoration projects.

Based in Oñati, Spain, ULMA was established in 1961 by six partners: Pedro Ugarte, Esteban Lizarralde, Julián Lizarralde, Isidro Mendiola, Ignacio Maiztegui and Julián Ayastui. The company's name was derived from the initials of the founders' surnames.

In 1963, ULMA introduced its first scaffolding system 'JJEIP' and took the first steps in the construction industry. The company began its internationalisation process in 1976.

Today, ULMA is present in more than 50 countries, with more than 20 subsidiaries all over the world. The company employs about 2,168 people globally.

Comprehensive solutions

Catering for all types of concrete structures, ULMA systems comprise wall, column and slab formwork, shoring systems, high-tech climbing formwork, timber beams and plywood, tunnel and bridge formwork and a wide range of safety equipment.

Among the highlights is the MK system, shared Edward De Marta, ULMA head of sales for East Asia and Pacific. "It is very versatile and can be adapted to a large number of applications. This makes the system an attractive choice for our customers."

Speaking to SEAC at a recent press event, Mr De Marta said the self-climbing formwork is also an important solution. This system can be lifted hydraulically without the need for a crane and is highly cost-effective due to shorter construction cycles.

The self-climbing, guided and conventional climbing formwork systems are most appropriate for high walls. They are typically used in the construction of towers, skyscrapers, cores, bridge piers, pylons and dams. These climbing systems are compatible with all types of ULMA wall formwork.

The wall and column formwork is well suited for the construction of concrete walls, columns, side walls, foundations, footings, abutments, etc. The slab formwork covers various applications, such as large slabs, solid and lightened, inclined surfaces, hanging beams, infilling, column heads, cantilevers, etc.

ULMA also manufactures tunnel formwork – specialising in cut-and-cover and mine tunnel construction methods – and bridge formwork for the construction and repair of different types of bridges.

The company's high load-bearing prop and shoring systems are designed for the construction of slabs, bridge decks, column heads, tunnel vaults or any other structure requiring the use of shoring.

In addition, ULMA BRIO Ringlock multidirectional scaffolding is ideal for the construction, industrial, energy, naval and entertainment industries. It is extremely flexible, safe and cost-effective, allowing high assembly rates due to its design and simplicity. The company also offers frame scaffolding, suitable

TOP AND ABOVE: **ULMA was involved in the construction of Cebu-Cordova Link Expressway (CCLEX), an iconic landmark in the Philippines. The company worked on the most technically challenging structures of the project.**

The Thamrin Nine Tower 1, Indonesia's tallest building, is another major project in Southeast Asia that ULMA has taken part in.

for all types of facade covering works for restoration, renovation, etc.

Southeast Asian presence

ULMA has established itself in the Southeast Asian market, working on many major projects across the region. "In general, Southeast Asia is a growing market for us – like Vietnam, Indonesia and the Philippines – which presents a lot of opportunities," said Mr De Marta.

"The Cebu-Cordova Link Expressway (CCLEX) in the Philippines, for example, is one of our major projects." For this cable-stayed bridge, which was opened in 2022, ULMA undertook the most technically challenging structures: the pylons, the working platforms for installation of the cable-stayed structure, as well as the piers, pier caps, and pier segments. The company's ATR system provided a solution for the octagonal pylons of 150 m in height with variable sections.

"Our work on the CCLEX project was a big success; it serves as an excellent reference for us not just in Asia, but around the world," said Mr De Marta. The company is now involved in more key infrastructure projects in the Philippines, such as the Malolos-Clark Railway (Package 2 and 4) and the Davao City Bypass, as well as a variety of residential, office and mixed-use development projects.

In Indonesia, ULMA also provided its solutions for the construction of Jakarta-Cikampek II Toll Road, added Mr De Marta. This essential road (about 38 km) is part of a government masterplan to ease traffic congestion towards and around Jakarta and to boost economic growth by improving the country's infrastructure.

Other major projects that ULMA has taken part in include: the Thamrin Nine Tower 1, Indonesia's tallest building at over 330 m high; Ulu Jelai Hydroelectric Project and Tanjung Bin Power Plant, Malaysia; VietinBank Business Centre Office Tower in Hanoi, Vietnam; Marina Bay Cruise Centre Singapore plus various residential, retail, office, industrial and MRT projects, Singapore; to name just a few. ■

Website: www.ulmaconstruction.com

ABOVE: **Edward De Marta, ULMA head of sales for East Asia and Pacific (first from left), met with SEAC during a recent press event to share the company's activities in the Southeast Asian market.**

LEFT: **The global trade media visited ULMA's headquarters in Oñati, Spain, to take a closer look at the company's innovations in formwork and scaffolding systems**

The wall and column formwork is well suited for the construction of concrete walls, columns, side walls, foundations, footings, abutments, etc.

The high load-bearing prop and shoring systems are designed for the construction of slabs, bridge decks, column heads, tunnel vaults or any other structure requiring the use of shoring.

CAMAC VERTICAL ACCESS EQUIPMENT FOR PASSENGERS AND MATERIALS

Headquartered in Barcelona, Spain, Camac manufacturers a complete range of mast climbing work platforms, transport platforms, material hoists and passenger lifts, as well as other auxiliary equipment for the construction industry.

Originally, in the 1960s Camac was concentrated on the production of small machinery, such as concrete mixers and wire hoists. In the following decades, driven by market needs and demands, the company expanded its range of products with a variety of lifting equipment and tools for the construction industry.

One of the highlights from Camac is its rack and pinion hoists for materials (material hoists), which offer capacities of 250-1,700 kg and a height of up to 150 m. Designed with various basket dimensions, they are ideal for installing on the facade or scaffolding. All models include an emergency brake.

The Camac Smart material hoist, which has a payload of 250 kg, is designed specifically to work with scaffolding systems. This unit is light and compact, with reduced dimensions, allowing its easy installation inside the scaffold. Other material hoists from Camac include the EC-HA-500/120 for lift shaft, EC-600/120, EC-1000/150 and EC-1700/150, with payloads of 500 kg, 600 kg, 1,000 kg and 1,700 kg respectively.

Speaking to the global trade media at a recent press event, Gabriel Jorba, Camac sales and managing director, said that the company's transport platforms – designed for lifting personnel

Gabriel Jorba, sales and managing director of Camac, recently talked to the global trade media about the company's latest innovations and developments as well as its operations in the international market.

ABOVE: **Mr Jorba gave the media a tour of Camac facility and provided insights into the company's products. He also demonstrated the capabilities of Camac material hoists.**

LEFT: **Based in Barcelona, Spain, Camac offers a wide range of mast climbing work platforms, transport platforms, material hoists (pictured) and passenger lifts, as well as other auxiliary equipment for the construction industry.**

LEFT: **Designed for lifting personnel and materials, Camac transport platforms have been growing in demand internationally. Here is one of the models, the ECP-1500, featuring a payload of up to 1,500 kg.**

BELOW: **Camac ladder hoists are suitable for solar panel installation. These lightweight structures are able to lift materials onto roofs and decks. The ladder hoist 150 (pictured) can work in either a vertical or an inclined position, with a payload of up to 150 kg.**

and materials – have been growing in demand internationally. These units feature different dimensions and capacities, with a height of up to 150 m.

Camac transport platforms can also be installed quickly on the jobsite. There are three models available, namely the ECP-500/120, ECP-1000/150 and ECP-1500/150, with payloads of 500 kg, 1,000 kg and 1,500 kg respectively.

According to Mr Jorba, Camac is currently looking for investors to accelerate the company's growth in the global market and it is open to be acquired.

Solar panel hoists

Mr Jorba explained that in the last three years or so, given the booming solar power sector globally, Camac has also developed ladder hoists suitable for solar panel installation. These lightweight, modular aluminium structures are able to lift materials onto roofs and decks.

The ladder hoist Driver 100 has a payload of 100 kg. It operates with a simple battery-powered screwdriver, with no need for any electrical sources. Its height in inclined installation is 12 m. Meanwhile, the ladder hoist 150 with a payload of 150 kg can work in either a vertical or an inclined position. Its height in vertical and inclined installation is 30 m and 15.5 m, respectively.

The ladder hoist 200 features a payload of 200 kg. It can also work in either a vertical or an inclined position in order to adapt to the needs of every building site. Its height in vertical and inclined installation is 40 m and 20 m, respectively. ■

Website: www.camacsa.com

LOOKING FOR INVESTORS:

Camac is currently looking for investors and the company is open to be acquired. Interested parties can visit Camac website for more details on the products, or contact the company directly: camac@camacsa.com

ROBUST, ERGONOMIC **TOPAC** PNEUMATIC HAMMERS FOR GLOBAL MARKETS

Based in Gipuzkoa, Spain, Topac manufactures pneumatic hammers for the mining, construction, quarry and other industrial sectors. The product range includes pick hammers, mini pick hammers, rock drill hammers and concrete breakers, as well as related tools and accessories.

Topac is the brand of the pneumatic hammers division of Elcoro Decoletaje, a Spanish industrial group founded in 1892. All Topac hammers are manufactured at the Gipuzkoa facility and comply with European CE standards.

According to Topac, its hammers are exported to numerous markets such as Colombia, Brazil, Cuba, Costa Rica, Ecuador, Guatemala, Mexico, Peru, Uruguay, as well as Europe, North Africa,

RIGHT: **Topac offers various pneumatic hammers for the mining, construction, quarry and other industrial sectors globally. The products are seen here on display at the manufacturer's facility in Gipuzkoa, Spain.**

The T-330 (left) and T-8 (middle) pick hammers, featuring a weight of 5.5 kg and 8 kg respectively, are suitable for use in mining, construction of tunnels, demolition of concrete, and more.

The T-275 concrete breaker with a weight of 30 kg is well suited for heavy demolition works.

Indonesia and the Philippines. The brand is currently present in 25 countries and continues to expand its distribution network globally.

Topac hammers feature a functional and ergonomic design, with a reduced number of parts and an air chamber system. They require no in-line lubrication, except for the drill hammers.

The pick hammers, with weights of 5.5 kg and 8 kg, are lightweight and small in size. They are suitable for use in mining, construction of tunnels, demolition of concrete, and more.

The mini pick hammers weigh only 5 kg and offer low air consumption. Designed for ease of operation, they are excellent for construction, mining, rehabilitation and other industrial applications.

The concrete breakers comprise two models. The T-275 with a weight of 30 kg is well suited for heavy demolition works. Its exclusive 'air chamber' system allows users to overcome the vibration tests without additional tools, like antivibration handles. Meanwhile, the T-103 has a weight of 10.5 kg and is ideal for light demolition works.

The rock drill hammers, weighing 17 kg and 25 kg, are specially designed for high speed drilling. They feature low air consumption and can be supplied with a water jet. The air-line lubricator T-5000 should always be used to ensure a proper running, efficiency and long life of these drill hammers.

All Topac hammers have a pressure of between 5 bar and 7 bar. They provide reduced maintenance costs due to less wear and tear on parts. This also makes them highly durable. ■

Website: www.topac.es

The Topac team at the press event. From left: Ignacio Galarraga Zurutuza, commercial director; María Jesús Rodríguez, manager; and Edurne Lascurain Caño from the commercial department.

ABOVE: **Topac demonstrated the capabilities of its hammers during the press event. These hammers feature a functional and ergonomic design, with a reduced number of parts and an air chamber system.**

LEFT AND FAR LEFT: **The T-58 rock drill hammer (on the far left), weighing 25 kg, is designed for high speed drilling. The air-line lubricator T-5000 (on the left) should always be used to ensure a proper running, efficiency and long life of the drill hammer.**

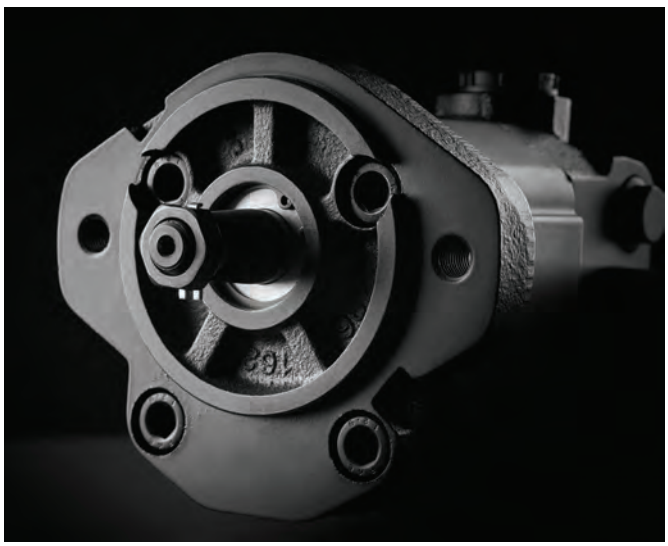
ROQUET HYDRAULIC SOLUTIONS DESIGNED FOR OFF-HIGHWAY APPLICATIONS

Spanish global manufacturer Roquet Hydraulics supplies a wide range of hydraulic components and systems to major OEMs in the construction, agriculture, mechanical handling and transport sectors around the world.

The company's portfolio comprises cylinders, gear pumps and motors, control valves and castings. In the construction sector, Roquet develops products largely for compact equipment, including mini excavators, skid steer loaders, compact track loaders and compact wheel loaders. It also provides solutions for telehandlers.

During a recent press event, Roquet said 51.30% of its sales in 2023 came from construction applications, followed by agriculture with 32.94%. In total, the company produces up to 700,000 cylinders, 100,000 pumps and motors and up to 500,000 spools per year. It has different manufacturing plants – located close to Barcelona, Spain (the company's headquarters and four production plants); in Ploiești, Romania (one cylinder production plant); and one commercial office in Atlanta, USA.

Founded in 1940, Roquet today has a global workforce of about 800 people, selling its products in over 30 countries across five continents to OEMs as well as dealers. The company is also active in the construction and agriculture sectors in Asia, with a warehousing facility in Bangkok, Thailand.



TOP, ABOVE AND LEFT: **Roquet manufactures a wide range of hydraulic components and systems for major OEMs in the construction, agriculture, mechanical handling and transport sectors globally. The company's portfolio comprises cylinders, gear pumps and motors, control valves and castings.**

Roquet has its own foundry and several manufacturing plants. The company sells its products in over 30 countries across five continents.

Components for tough applications

Roquet cylinders have been designed for demanding applications. The majority of the cylinders feature case-hardened rods with extremely high corrosion resistance. Tubes are honed after welding ports, which contributes to long seal life and makes piston-over-port damping an option.

Roquet also manufactures aluminium and cast-iron bodied gear pumps and motors. All covers are cast-iron (from the company's own foundry) which reduces noise, increases life and makes possible in-built valves for speed control, etc. In addition, Roquet offers various mobile hydraulic control valves and new valves for specific mobile OEM applications.

Apart from its three main product lines, Roquet also develops valves and systems for specific applications where experience with a variety of different hydraulic components can be combined to offer an interesting solution. These include levelling valves, agricultural marker valves, compact power-packs and electro-hydraulic actuators, among others.

R&D is another priority at Roquet. The company's current research is focused on 'smart' components/systems and increased energy efficiency. In recent years, it has completed the following projects:

- Four-year design-for-life research project which led to substantial reduction in raw material (cylinders).
- Three-year research project to increase energy efficiency and reduce environmental impact (castings for pumps and control valves).
- Three-year research project to improve reliability and increase energy efficiency of gear pumps and motors. ■

Website: www.roquetgroup.com

Ruth Martínez, sales and marketing at Roquet Hydraulics (left) and Elisabet Vilaró, plant manager of Dinacil at Roquet Hydraulics talked to SEAC during a recent press event.

ABOVE AND BELOW: **In the construction sector, Roquet develops products largely for compact equipment, including mini excavators, skid steer loaders, compact track loaders and compact wheel loaders. The company also provides solutions for telehandlers.**

OLIPES: THE EXPERT IN LUBRICANTS FOR INDUSTRIAL MACHINERY AND VEHICLES

The Madrid, Spain-based company Olipes specialises in the design and manufacture of lubricating oils and greases, anti-freeze coolants, brake fluids and other fluids for the maintenance of industrial machinery and vehicles globally.

Founded in 1993 by Arturo Oliver and his sons, Olipes is now present in more than 45 countries across four continents. The company produces new lubricants and fluids for 75 industrial sectors every year, including mining, construction equipment, cutting and machining, marine, motorcycle and automotive, as well as agriculture, forestry and gardening, to name just a few.

Olipes develops an average of 50 new product formulations annually, which are incorporated into its portfolio of more than 2,500 references, marketed under its own brand or packaged for more than 80 brands, including major OEMs. The company has a production capacity of over 100,000 t per year.

Olipes also manufactures tailor-made products, such as lubricating greases and oils for arctic climates, EAL lubricants for the marine sector, or oil operations in sensitive environments, fluids for the cooling and lubrication of new electric motors, plus a wide range of biodegradable lubricants.

According to Olipes, the company reinvests 75% of its profits in R&D&I (research and development and innovation). This is reflected in its advanced laboratories, offices and highly automated manufacturing, packaging and warehousing facilities

TOP AND ABOVE: **Olipes specialises in the design and manufacture of lubricating oils and greases, anti-freeze coolants, brake fluids and other fluids for the maintenance of industrial machinery and vehicles globally.**

LEFT: **SEAC recently visited Olipes' headquarters in Madrid, Spain, to learn more about the company's products and global activities.**

Construction equipment potential

Speaking to the global trade media during a recent press event, Olipes shared that the company's special expertise lies in developing lubricating greases, making it a major producer in Spain and throughout Europe.

Olipes serves its global customers through an extensive network of distributors. In Asia, the company also provides lubricants for the construction equipment sector.

The construction equipment sector offers the widest applications, especially after the pandemic, and has delivered one of the biggest profits for the company, said Fernando Díaz, executive managing co-director of Olipes. "It is a highly focused sector, where we don't have much competition," he noted, adding that "customers in this sector also choose quality, so we have the products and expertise that meet their requirements."

Moving forward, Mr Díaz said Olipes is open to adopting new approaches. "For example, we may look into manufacturing products regionally to be closer to our customers."

Olipes further revealed that the company is not only committed to creating products that are more sustainable, but also dedicated to making society better and fairer. Under its corporate social responsibility (CSR) strategy, Olipes carries out a number of activities, including cooperation to help children. Through the Abriendo Caminos Foundation, the company contributes up to 10% of its profits each year towards health improvement, social integration, education and training for children and young people at risk of social exclusion ■

Website: www.olipes.com

Fernando Díaz, executive managing co-director of Olipes (far left) and Andrei Bocsa, export area manager of Olipes (left).

Olipes reinvests 75% of its profits in R&D&I, which is reflected in its advanced laboratories, offices and highly automated manufacturing, packaging and warehousing facilities.

ABOVE AND LEFT: **Olipes develops an average of 50 new product formulations each year, and it has an annual production capacity of more than 100,000 t.**

LIGHTWEIGHT, EASY-TO-USE STEEL SCAFFOLDING SYSTEMS FROM **TENDO**

Tendo designs and manufactures steel scaffolding systems for industrial and construction applications. Based in Zaragoza, Spain, the company provides two scaffolding models – frame and multi-directional – which are inter-compatible in terms of height. These systems can be adapted seamlessly to meet the needs of the projects.

The frame scaffolding, called Goya, is easy to use and transport. Available in 0.70 m width, the system has few elements for quick set-up and operations, thus saving on the equipment and time required for installation and removal. This lightweight, compact pre-fabricated frame scaffolding is also compatible with Tendo's Multi system in some configurations.

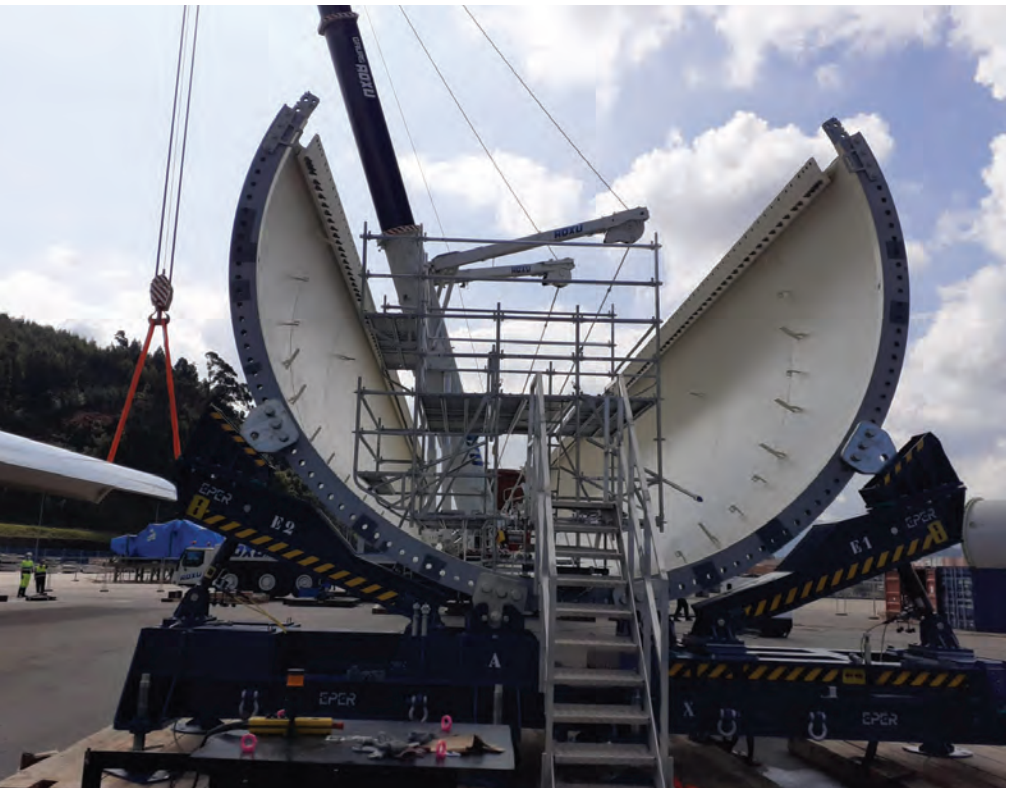
Tendo's multi-directional scaffolding, called Multi, is fitted with eight different joints on a single surface. The width of the scaffolding can be adapted to the desired measurements, and the structure can be adjusted to all types of facades and work sites. This system is ideal for installing scaffolding towers with or without wheels for moving them.

The Multi system is compatible with all possible configurations for construction, restoration, renovation, industrial maintenance, etc. It offers an option of 180° assembly for each connection, as well as a wide range of components. In addition, the structure is robust, featuring a precise assembly and built-in locking system, and is equipped with high-resistance guides (galvanised components) with a diameter of 48.3 mm.

Since 1990, Tendo has been serving customers in the Spanish construction and industrial sector, supplying them with tailor-made scaffolding solutions that comply with relevant standards and regulations. The company said its products are also used in some markets in North Africa and Latin America. In 2016, Tendo became part of the French-based Frénéhard & Michaux group, a major provider of access and safe working-at-height solutions.

All Frénéhard & Michaux group companies possess a high-level of 'materials' expertise focusing on aluminium and steel, with the same approach to height. By being part of the group, Tendo now has the opportunity to grow in industrial and construction markets, and further develop its products and services. This partnership also allows Tendo to reinforce its core business and create a synergy with other companies within the group. ■

Website: https://andamios-tendo.com



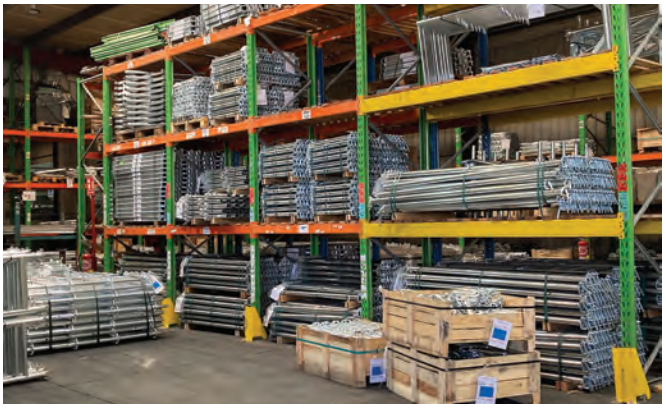
ABOVE: **Tendo scaffolding systems can be adapted seamlessly to meet the needs of the projects.**

RIGHT: **The frame scaffolding, called Goya, is easy to use and transport. Available in 0.70 m width, the system has few elements for quick set-up and operations.**

ABOVE: **During a press event at Tendo's headquarters in Zaragoza, Spain, the global trade media had the opportunity to tour the company's facility.**

LEFT: **Carlos Frías, sales manager of Tendo (on the left) and Fernando Celimendiz, plant director of Tendo were present at the press event.**

LEFT, MIDDLE AND RIGHT: **Tendo designs and manufactures steel scaffolding systems for industrial and construction applications. The company provides two scaffolding models – frame and multi-directional – which are inter-compatible in terms of height.**



FAR LEFT AND LEFT: **These are some of the components of Tendo scaffolding systems.**

‘All parties can resolve issues early, rather than waiting until the end’: Surbana Jurong on collaborative contracting

In recent years, the Singapore government has introduced guidelines and initiatives to encourage the adoption of collaborative contracting in the construction industry. Max Shea, director, project and contract management (Asia) at Surbana Jurong (SJ), shares with SEAC his perspective and the importance of this contracting model.

Collaborative contracts allow the project owner and its key partners (architects, engineers, contractors, equipment suppliers, etc.) to work together closely in the development of a project. They tend to focus on common goals, rather than individual interests.

This approach is not completely new to Singapore, said Mr Shea. "For example, early contractor involvement (ECI) is a form of collaborative contracting that has been used before.

"Another example of collaborative contracting is the integrated project delivery (IPD), which is a construction project delivery method where parties involved in the design, fabrication and construction are joined together under a single agreement to foster more effective communication throughout all phases of the project."

Highlighting the main benefits of collaborative contracting, Mr Shea pointed out that "it encourages all parties and stakeholders to act in a spirit of mutual trust and co-operation. This contracting model can result in better time and cost control, and equitable sharing of project risks."

SJ, through its company Threesixty Cost Management, helps clients manage the associated costs and contracts of their projects in an independent, efficient and responsible manner. SJ provides in-depth cost and commercial management and contractual advice from project inception to completion. The company has also been involved in several projects using collaborative contracts.

'Steep learning curve'

Earlier this year, the Building and Construction Authority (BCA) launched the NEC4 contract framework in Singapore to widen the adoption of collaborative contracting. This is in addition to the Public Sector Standard Conditions of Contract (PSSCOC) Option Module for public sector projects.

> *"It encourages all parties and stakeholders to act in a spirit of mutual trust and co-operation. This contracting model can result in better time and cost control, and equitable sharing of project risks."*

"While NEC4 is widely used in the UK, Hong Kong and Australia, it is very new to Singapore," said Mr Shea. "The local industry has been using PSSCOC, SIA and REDAS for the last 10 to 20 years. It will be a steep learning curve for all stakeholders, including owners/developers, consultants, contractors, sub-contractors, suppliers, etc., if the NEC4 form of contract is adopted."

"The PSSCOC Option Module comprises a set of collaborative clauses to be used together with PSSCOC, or to supplement the core clauses in PSSCOC," he explained. "The NEC4 contract framework, on the other hand, is altogether a new form of contract. The terminologies and contract mechanisms under the NEC4 contract framework are also different, when compared to PSSCOC, SIA, or REDAS.

"We have adopted PSSCOC Option Module E collaborative contracting in one on-going residential project, and we are now adopting NEC4 contract in another on-going residential project."

Mr Shea further mentioned that NEC offers a full suite of contracts including sub-contracts; design, build and operate contracts; and facilities management contracts. This will allow greater collaboration among stakeholders involved in the project.

Max Shea, director, project and contract management (Asia) at SJ.

Speaking of the challenges in the private and public sectors when it comes to implementing a collaborative contracting process, Mr Shea said, "As the typology of projects is different, the risks and challenges are also different. For example, in a commercial project, private sector clients have pressure to deliver the project in time to avoid/minimise the loss of profit/loss of rental income if the project is delayed. As such, there are usually more onerous contract requirements in place to protect the private sector clients' interest."

Indeed, the shift towards collaborative contracting will not be easy, given the process is complex and requires a change of mindset for all stakeholders. Nevertheless, the potential benefits for the construction industry are significant – ones that will improve the way the projects are delivered – and these cannot be ignored.

Mr Shea reiterated, "As collaborative contracting encourages mutual trust and co-operation, all parties can have honest and open communication. Thus, they are able to identify issues early and work together to provide solutions and resolve these issues together, rather than waiting until the end of the project." ■

Website: www.surbanajurong.com

CELEBRATING EXCELLENCE IN SINGAPORE'S CONSTRUCTION PROJECTS

There are five winners for the 2024 BCA 'Project of the Year' Award. They were selected based on their achievements in adopting innovative construction methods, driving digitalisation, improving productivity and advancing sustainability.

The Sentosa Sensoryscape project is lauded for groundbreaking achievements in the use of design for manufacturing and assembly (DfMA) methods to bring complex architectural designs to life. The project team employed digital tools to break down the complex designs into smaller components that were fabricated offsite, before being transported and assembled onsite. The team also incorporated time- and manpower-saving solutions, such as mechanical joints instead of more common welded joints.

Another winner, Geneo, overcame the manpower and supply chain disruptions during the Covid-19 period to achieve extraordinary results in sustainability. The team utilised CarbonCure concrete in 44% of its project concrete needs. This is estimated to have reduced almost 3.4 mil kg of CO_2 emissions.

The Project of the Year Award by Singapore's Building and Construction Authority (BCA) – formerly known as BCA Built Environment Transformation Award – recognises building and civil/infrastructure projects that have demonstrated commitment towards transformation.

The award seeks to encourage project parties to work collaboratively, drive changes and attain impactful outcomes at both project- and enterprise-levels. There are six award categories, namely Residential Buildings, Commercial/Mixed Development Buildings, Industrial Buildings, Institutional Buildings, Civil/Infrastructure Projects, and Others. ■

SENTOSA SENSORYSCAPE

Others

Image: BCA

Developer:
Sentosa Development Corporation

Builder:
Gammon Pte Ltd

Architect:
Axis Architects Planners Pte Ltd

Civil & Structural:
AECOM Singapore Pte Ltd

Mechanical & Electrical:
AECOM Singapore Pte Ltd

Quantity Surveyor:
Surbana Jurong Consultants Pte Ltd

CHALLENGES

The site topography was quite uneven and there was a need to ensure that the rest of Sentosa remained operational while construction was underway.

SOLUTIONS

The project utilised design for manufacturing and assembly (DfMA) strategies to bring its complex architectural design to life.

- The benefits of using DfMA:
  - o Greater quality control over each precast element.
  - o Enabled the use of mechanical joints instead of welding to reduce installation time and manpower required on-site.
  - o Made it easier to design using modelling software that would feed into the fabrication proces.
- Several other digital tools were used to ensure precise quality control:
  - o 3D laser scanning to compare scans of precast moulds.
  - o Fabrication BIM model to validate the geometry.
  - o Drone capture and 3D mesh mapping to lay down areas for DfMA components. ■

7 SCIENCE PARK DRIVE (GENEO)

Commercial Buildings

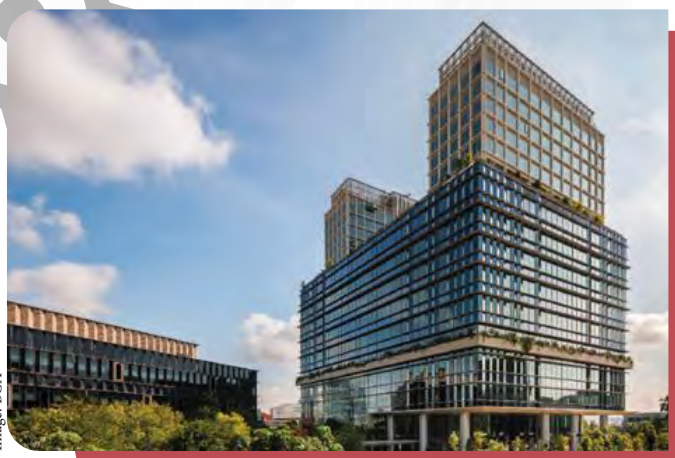


Image: BCA

Developer:
CapitaLand

Builder:
Woh Hup Pte Ltd

Architect:
Surbana Jurong Consultants Pte Ltd

Civil & Structural:
Mott Macdonald Singapore Pte Ltd

Mechanical & Electrical:
Squire Mech Pte Ltd

Quantity Surveyor:
WT Partnership (S) Pte Ltd

CHALLENGES

The project kick-started in 2021 amidst Covid-19 measures. The project team faced a lot of manpower and resource issues.

SOLUTIONS

The team decided to work more collaboratively and deploy digital tools and innovative technologies to improve productivity.

• Improved coordination through digital tools for BIM coordination and a worker management system.

• Drew more value out of BIM models through automating the calculation of concrete required. The supply chain partners were also able to access this model and link delivery orders directly to each building elements and groups in the model.

• Despite the challenges, the project still managed to adopt several novel features, such as distributed district cooling systems, the use of 1,400 PV solar panels, adopting CarbonCure concrete and incorporating considerations as part of the Geneo cluster's landscape and biodiversity plans.

• This project used 44% of CarbonCure concrete in its development. CarbonCure is a type of concrete enabled by cutting-edge technology that mixes carbon dioxide during the manufacturing process. The extensive usage of CarbonCure concrete amounted to an estimated 3,400,000 kgCO2e of emissions reduction or roughly equivalent to the amount of emissions that can be captured by 3,864 trees. ■

Additional notes:
The project obtained the Green Mark (GM) Platinum Super Low Energy (SLE) certification.

JTC LOGISTICS HUB @ GUL

Industrial Buildings

Image: BCA

Developer:
JTC Corporation

Builder:
Kimly Construction Pte Ltd

Architect:
AWP Architects Singapore

Civil & Structural:
Meinhardt (Singapore) Pte Ltd

Mechanical & Electrical:
Meinhardt (Singapore) Pte Ltd

Quantity Surveyor:
WT Partnership (S) Pte Ltd

CHALLENGES

Unique DfMA features. This complex design would have required much highly skilled manpower to set up temporary scaffolding and carry out welding works.

SOLUTIONS

The project team proposed an alternative SEN innovative steel system, which combines lightweight columns connected by modular bolted splice joints and steel-plate composite beams.

• Benefits: Productivity improvement of up to 36%, less material wastage, lower safety risks for workers and higher headroom for internal spaces.

• The project team proposed such an innovative system from overseas learning trips that Kimly regularly organises ever since it set up the Kimly Academy in 2021. It was on one of these learning trips that they were introduced to this system and they subsequently found an opportunity to implement this technology in a project. ■

Additional notes:
The project obtained the Green Mark (GM) Platinum certification.

THE GREENHOUSE AT DULWICH COLLEGE (SINGAPORE)

Institutional Buildings

Image: BCA

Developer:
Dulwich College (Singapore) Pte Ltd

Builder:
Debenho

Architect:
DP Architects

Civil & Structural:
KTP Consultants Pte Ltd

Mechanical & Electrical:
Bescon Consulting Engineers Pte

Quantity Surveyor:
Turner & Townsend

The first international school building in Singapore to achieve the Green Mark (GM) Platinum Zero Energy Building certification.

• It was able to integrate sustainability into everyday life, through building features that students can interact with. For example, it uses kinetic floor tiles to generate energy when students step on them.

• Other key sustainability features include:

o Building-integrated photovoltaics that generates 40% of the building's energy consumption and offsets 85 t of CO2 (equivalent to planting 3,400 trees).

o Efficient systems for chiller plant, air handling, lighting and lift control to keep energy consumption low. These systems are linked with a smart platform to monitor zonal changes in energy demands.

o Data from the building is displayed real-time on screens within the building to educate students on sustainability. ■

THE WOODLEIGH RESIDENCES & THE WOODLEIGH MALL

Residential Buildings

Image: BCA

Developer:
Kajima Development and SPH Holding

Builder:
Kajima/Tiong Seng Contractor JV

Architect:
DP Architects

Civil & Structural:
Meinhardt (Singapore) Pte Ltd

Mechanical & Electrical:
Beca Carter Hollings & Ferner (S.E Asia) Pte Ltd

Quantity Surveyor:
Asia Infrastructure Solutions Singapore Pte Ltd

CHALLENGES

Needed to carry out three layers of work concurrently (basement excavation works, L2 & L3 Podium works, and higher floors PPVC works).

SOLUTIONS

• Strong coordination from the design process, to determining the construction methodology, as well as the sequencing of works and site logistics.

• Supported by digital tools such as:

  o BIM 360 for document and knowledge management.

  o Pan-Tilt-Zoom cameras, fixed/drone cameras, HoloBuilder 360 photo reality capture for site progress monitoring.

  o Leica BLK2GO handled imaging laser scanner + Cyclone 3DR software for mapping accurate as-built measurements.

  o Novade for quality and defect tracking.

• Supported by changes in methodology, such as reviewing the design to achieve higher level of standardisation (from 100 types to 64 types of steel moulds).

• The project team was able to deploy these innovative tools as Kajima proactively upskills its staff, especially in emerging areas, such as computational BIM or construction productivity. ■

Additional notes:
The project obtained the Green Mark (GM) Platinum certification.

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