SOUTHEAST·ASIA CONSTRUCTION

NOVEMBER - DECEMBER 2023

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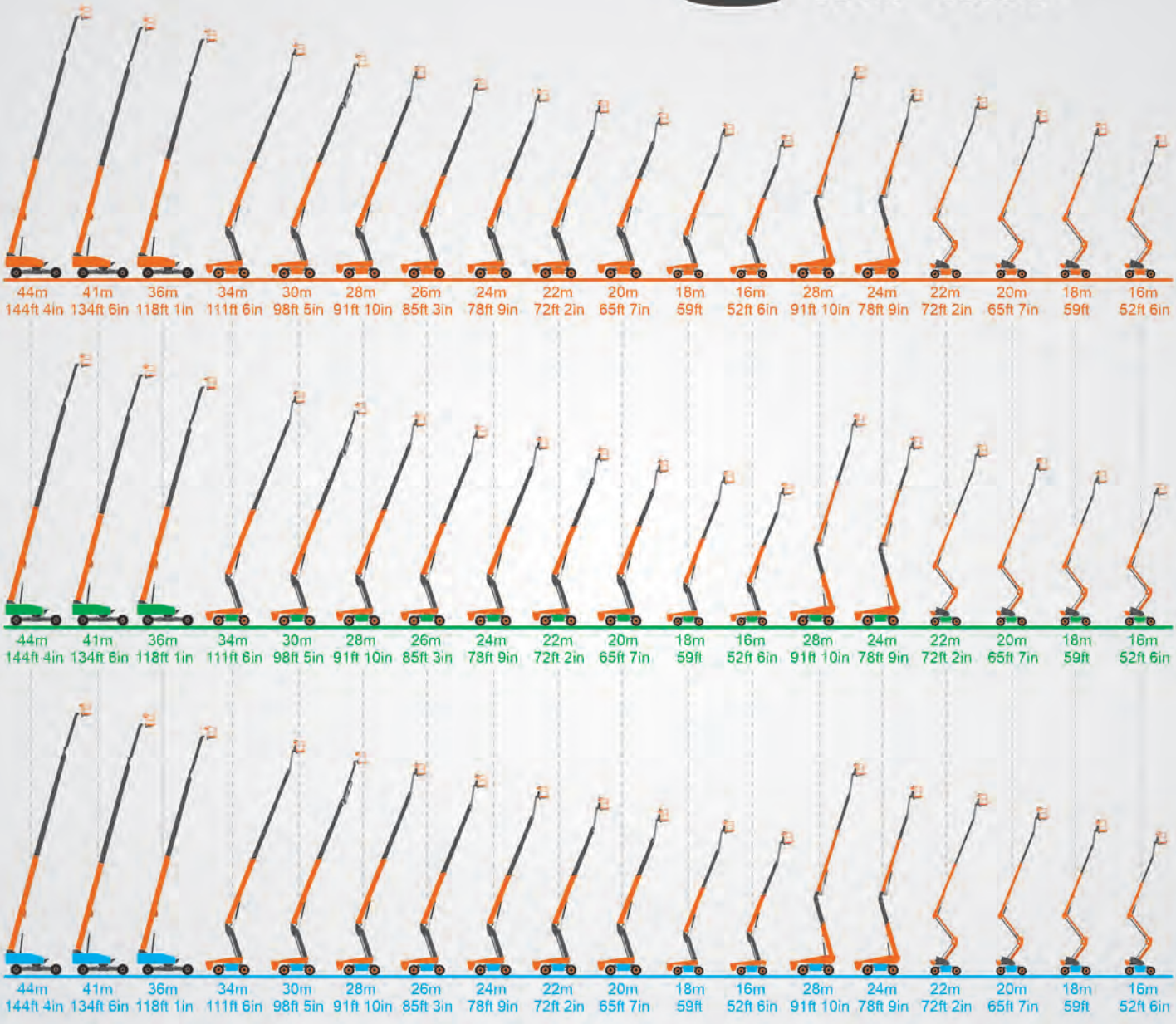

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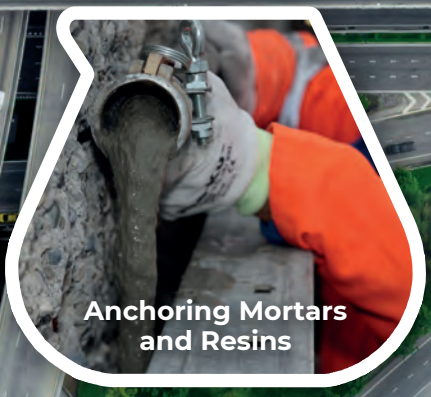

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ISSN 2345-7082

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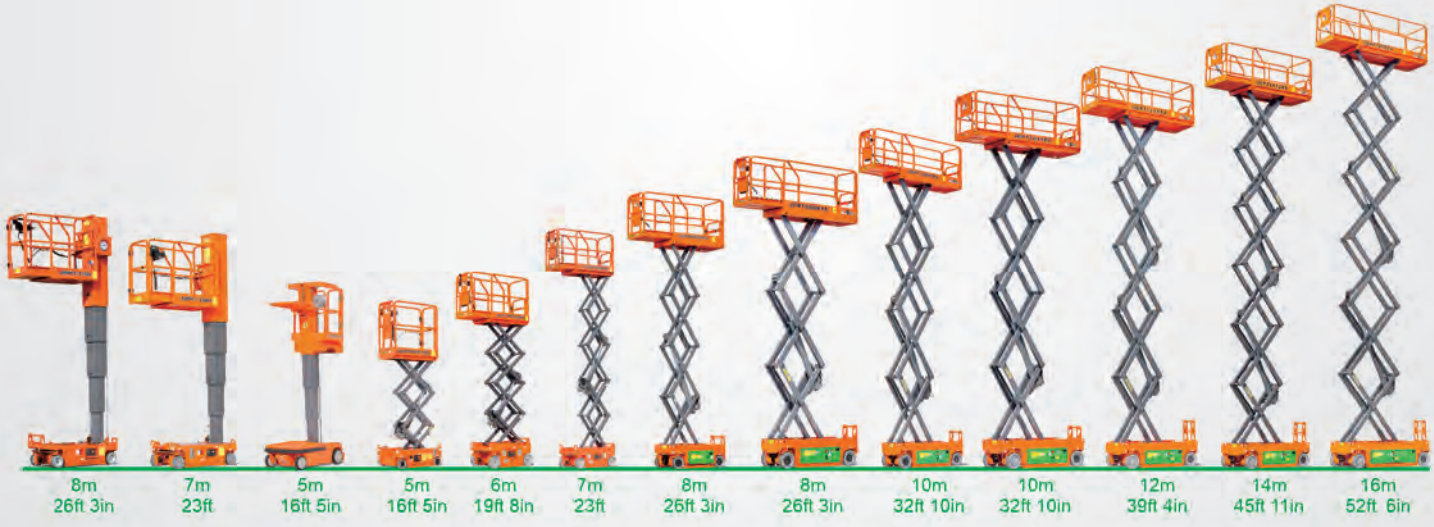

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PROJECTS & OTHER FEATURES

SOUTHEAST ASIA CONSTRUCTION is published six times a year by:
Trade Link Media Pte Ltd. RCB Registration no: 199204277K
Address: 1 Paya Lebar Link, #04-01 Paya Lebar Quarter 1 (PLQ 1), Singapore 408533
Tel: +65 6842 2580 Email: info@tradelinkmedia.com.sg
Website: http://seac.tradelinkmedia.biz

The magazine is available free-of-charge to applicants in the building and construction industries who meet the publication's terms of control. For those applicants who do not qualify for free subscription, copies will be made available, subject to the acceptance by the publisher, of a subscription fee which varies according to the country of residence of the potential subscriber. Airmail (per year): Singapore - S$70; Malaysia and Brunei - S$120; Rest of Asia - S$180; Japan, Australia, New Zealand, Middle East, Europe and USA - S$220 (Inclusive of GST / Reg: M2-0108708-2).

Printed in Singapore by Fuisland Offset Printing (S) Pte Ltd.
MCI (P) 061/08/2023 • ISSN 2345-7082 (Print) and ISSN 2345-7090 (E-Periodical) • KDN No: 1560 (1271)-(6)

INTERNATIONAL SALES OFFICE:
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Vietur consortium awarded Vietnam's Long Thanh International Airport project

The Vietur consortium, led by Turkey-based IC İçtaş Construction, has won the contract to build the passenger terminal at Long Thanh International Airport, located in Dong Nai province, Vietnam.

The Phase 1 project will have a capacity of 25 million passengers and 1.2 mil t of cargo per year. Once all phases are operational, the airport is expected to serve about 100 million passengers per year.

Totalling US$1.5 billion, the contract undertaken by the consortium will include a terminal building and equipment installations. It is planned to be completed within 39 months. More than 10,000 employees are expected to work on the Long Thanh International Airport project.

"With this Long Thanh International Airport project, we are bringing our vast experience in construction and management to the Far East," said Fırat Çeçen, chairman of IC İçtaş Construction. "The Vietur consortium includes leading Vietnamese companies in their respective fields. We aim to deliver the first phase of the Long Thanh International Airport project to international standards within 39 months, in close coordination with our local and international partners."

Mr Çeçen added, "The rapid growth of the country's economy requires major infrastructure investments such as this airport. We appreciate the Vietnamese government's determination to complete such key projects. We also thank the Airports Corporation of Vietnam (ACV) for its fair approach and support during the preparation phase. We believe that ACV's support will play a crucial role in the success of the project." ■

Image: IC İçtaş Construction

Firat Çeçen, chairman of IC İçtaş Construction (1st from left), and Pham Minh Chinh, Prime Minister of Vietnam (3rd from right), attend the groundbreaking ceremony for the Long Thanh International Airport project.

Image: Airports Corporation of Vietnam

Phase 1 of the Long Thanh International Airport project will have a capacity of 25 million passengers and 1.2 mil t of cargo per year. The contract undertaken by the Vietur consortium is planned to be completed within 39 months.

Bouygues Construction wins contract to extend metro line in HK

Two of Bouygues Construction's subsidiaries, Dragages Hong Kong and Bouygues Travaux Publics, recently won a contract to extend the Tung Chung line of the Hong Kong Metro. Totalling HKD3.9 billion, the contract covers the extension of the line to the west of Lantau Island, a fast-developing area.

Carried out on behalf of MTR Corporation Ltd, operator of the Hong Kong metro, the work involves the construction of a 1.3-km tunnel and the creation of a new station, Tung Chung West, which will become the new terminus of the line.

This westward extension will provide service to a fast-growing district with a constantly rising population, improving mobility for users by linking Hong Kong's various districts and strengthening connectivity with the outside world in this strategic region.

In addition to the construction of the tunnel, which presents a considerable technical challenge in view of the configuration of the site, the population density and the constraints associated with an urban environment, the construction of the new metro station will have to respect both the nearby living environment and the natural environment.

"The entrances to the new station will provide natural light, and eco-responsible elements will be incorporated into the design of the surface facilities," said Patrick IU, managing director of Dragages Hong Kong.

The extension of the Tung Chung line is the fourth project carried out by Bouygues Construction teams for MTR Corporation, following the Sha Tin to Central Link, Shek Yam to Mei Lai Road and Mei Lai Road to Hoi Ting Road extensions. ■

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Construction of Singapore's Cross Island Line-Punggol Extension starts

Singapore's Land Transport Authority (LTA) recently held a groundbreaking ceremony to mark the start of construction work on the Cross Island Line-Punggol Extension (CPe) project.

The 7.3-km CPe comprises four stations, namely Punggol, Riviera, Elias and Pasir Ris. Three of the stations will serve as interchanges with other rail lines: CPe Pasir Ris station will link to the East-West Line, CPe Punggol station to the North East Line while CPe Riviera station will link to the Punggol LRT Line.

This new extension will provide better rail connectivity and greater accessibility for residents living in eastern Singapore, including Pasir Ris and Tampines North, as well as those residing in the north-east such as Punggol and Sengkang. New growth areas like Punggol Digital District and Changi Aviation Park will also benefit from this direct rail connectivity. The CPe is expected to be completed and open for passenger service by 2032.

Construction methods and technologies

According to LTA, as the CPe will be constructed near existing residential and industrial areas, innovative technologies and construction methods will be adopted to minimise inconvenience to stakeholders and to deliver the project effectively. For example:

a). Equipment that emits less noise such as electric excavators and battery power pack generators will be used at some sections of the worksite.

b). A robotic shotcrete machine will be deployed to construct a mined section of the tunnel, which will improve safety and productivity while reducing reliance on manpower.

c). Customised reinforcement bars, known as head-bars, will also be installed at appropriate sections of Riviera station, to streamline installation and increase productivity.

d). A large diameter tunnel boring machine (TBM) will be deployed to construct the tunnels between Elias station and Punggol station, via Riviera station. The 12.6-m TBM will only have to bore through the ground once to create sufficient space for two MRT tracks.

e). Technological solutions such as virtual reality (VR) and augmented reality (AR) will be adopted to enhance the design and coordination process, and further optimise the design of CPe stations. Design and coordination works would be supported by the use of building information modelling (BIM) tools, which help designers to coordinate and deconflict the locations of different services in the complex network of systems around the stations.

Moreover, LTA said CPe stations will incorporate active energy-saving features, including solar photovoltaic panels on entrance structures as well as hybrid cooling systems for public areas. The hybrid system uses fans in tandem with air-conditioning to keep stations comfortable for commuters while reducing overall energy consumption. Low-carbon concrete will also be used for some station structures. These measures will contribute to a greener and more sustainable land transport network for Singapore.

When completed, the CPe will connect to the main Cross Island Line (CRL) at Pasir Ris station. Construction works for the 12 CRL Phase 1 stations (Aviation Park to Bright Hill) commenced in January this year. LTA is progressively calling tenders for CRL Phase 2, which comprises six stations from Turf City to Jurong Lake District. Engineering studies are ongoing for the third phase of the CRL. ■

CPe Punggol interchange station.

CPe Riviera station.

CRL Phase 1 and CPe Pasir Ris station.

CPe Elias station.

All images: LTA

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Lendlease and Surbana Jurong partner on new digital ecosystem to increase construction productivity

Lendlease will work with Surbana Jurong as its go-to-market partner to deliver Podium for Development (P4D) – a transformative digital ecosystem that connects developers, designers and the supply chain, delivering high construction productivity and promoting sustainable building practices.

"Traditionally, the design process requires months of detailed design work and engineering before the building can be drawn and documented to capture the full complexity of the design. After the back-and-forth between many parties in the design process, the plans are then tendered to find a builder," explained Lendlease.

"Often, a builder may suggest using different materials or components that do not match the exact design intent. This can lead to additional time and money spent on redesigning to accommodate these changes, resulting in wastage."

The inadequate communication and collaboration between stakeholders along the value chain creates design errors, which accounted for 38% of construction disputes, pointed out Lendlease. Furthermore, only 31% of projects have managed to stay within 10% of their proposed budgets, according to a KPMG report. The industry's annual productivity growth has only increased by 1% over the past 20 years as compared to 2.8% for the total global economy, while contributing 40% of the world's total global greenhouse gas emissions, according to a McKinsey Global Institute report.

By harnessing design automation algorithms and computational capabilities within an open ecosystem, Lendlease aims to facilitate construction using prefabricated components directly supplied by manufacturers. This approach promotes design for manufacturing and assembly (DfMA), which is more productive and sustainable than traditional methods of construction.

Building from reality

With P4D, Lendlease seeks to collaborate with other developers globally and unify these fragmented nodes in the building process into an open digital platform that accelerates the entire process from design to supply, enabling DfMA.

According to Lendlease, the platform choreographs advanced computational algorithms to match design requirements with the supplier defined kit-of-parts to generate building designs. These design models automatically account for building specifications under prevailing regulations such as identified land-use, height restrictions and other planning parameters for residential, industrial, commercial and eventually, mixed-use development applications.

P4D allows detailed building models to be automatically generated based on a menu of options, which include number of units for residential developments, the desired floor-to-ceiling height and loading limit for industrial applications, and even the estimated cost of the project and timeframe. More importantly, it can generate a building based on the optimal components, fit for purpose from suppliers. This provides confidence early in the design process, thus ensuring greater accuracies and certainties right from the start.

Creating sustainable outcomes

Lendlease said it is in advanced negotiations with other developers and building authorities in Singapore and elsewhere on leveraging P4D to design and deliver projects in the future. The partnership with Surbana Jurong seeks to deliver this product – drawing on the experience and expertise of the wider Lendlease Digital ecosystem in Singapore, Silicon Valley, Sydney and Milan and support by the Economic Development Board of Singapore (EDB) – to the global built environment sector.

Image: Lendlease

The partnership agreement between Lendlease and Surbana Jurong was signed in Singapore. Both companies will work together on Podium for Development (P4D), in an effort to deliver high construction productivity and promote sustainable building practices.

"As an industry, we need to be building better at speed and in scale. Our ambition for P4D is to re-imagine how we create by changing entrenched methodologies and behaviours. This is why we are working with like-minded partners such as Surbana Jurong and inviting other developers and players in the built environment industry to join us in this journey as we promote best sustainable building practices that can be replicated and benefit other communities globally," explained Bill Ruh, CEO of Lendlease Digital.

Richard Kuppusamy, chief product officer for Podium at Lendlease, highlighted that "by generating a structural design in 15 to 20 minutes instead of the months involved in design using current methods, P4D leverages what is replicable and repeatable in building design via computational algorithms and AI. With the possibility of 70% of the building design being automated by P4D, human designers can focus their energy and efforts on more complex and subjective aspects of creativity."

"As a multidisciplinary global urban and infrastructure consultancy, Surbana Jurong is heavily vested in smarter ways of designing and engineering that cut costs and time, and optimise precious resources," said Yeo Choon Chong, CEO for ASEAN at Surbana Jurong. "P4D gives architects, designers and suppliers greater control to drive higher productivity in the built environment sector, as well as net zero and zero waste outcomes at the earliest stages of a project life cycle to reduce embodied carbon levels.

"We are excited about the prospect of collaborating with multiple project stakeholders on the cloud at the design stage. This is the next big step for the industry to bring Singapore's Built Environment Industry Transformation Roadmap to life." ■

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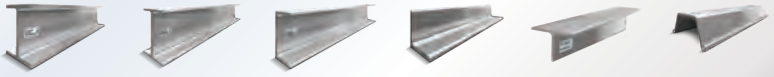

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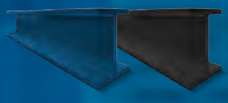

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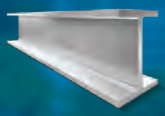

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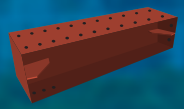

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Volvo CE electric machines make Indonesian debut

Around 100 guests in Indonesia attended a special networking and demonstration event that PT Indotruck Utama (ITU) held. Among the wide range of Volvo CE equipment on show were two electric machines – L25 and ECR25, making their public debut in the country.

ITU welcomed the customers and media to a two-day 'Inspire 2023' gala event in September, which took place in Borobudur Temple, Magelang city. The celebration featured product demonstrations, new technology and more under the theme of 'Sustainability for Tomorrow.'

As a Volvo CE dealer in Indonesia, ITU is fully aligned with the strong environmental care values of the Volvo Group and opened a new component rebuild centre (CRC) a few months ago to advance the company's ambitions towards the 'circular economy'.

Volvo Construction Equipment (Volvo CE) joined ITU at the event and showcased a host of machines, including the first two electric machines in the country. Although electric machines from Volvo CE are not currently for sale in Indonesia, visitors were the first to see them up close at this event.

The electric models displayed during the Inspire 2023 event were the L25H Electric compact wheel loader and the ECR25 Electric compact excavator. These machines were launched earlier in Singapore for the Southeast Asian market.

"Our electric construction machines will be available for sale in Indonesia starting in November. There is already a strong interest in electric machines from the processing and material handling industries," said Gerrit Lambert, head of market Indonesia at Volvo CE Asia.

"There's a lot of determination at both government and business levels to show real progress in reaching climate targets. ITU also understands how Volvo CE's electric machines can help customers reach those targets."

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

The L25 Electric compact wheel loader features a 2.1 t payload and a maximum speed of 20 kph. The machine comes with a 40 kWh battery pack and is expected to deliver six to eight hours of work per charge. Both machines offer near-silent operations and zero emissions while enhancing operator comfort, thanks to a working environment that removes the vibrations and noise associated with diesel machines.

In addition to giving visitors a first look at electric machines, two popular 20-t excavators were on display – an upgraded version of the fast and efficient EC200D plus one of the versatile EC210D models. From the range of articulated haulers, an A40G was shown ■

ABOVE: **PT Indotruck Utama held a special event in September 2023 to give Indonesian customers a first look at Volvo CE electric machines.**

LEFT: **The Volvo ECR25 Electric compact excavator comes with a 20 kWh battery array.**

ABOVE: **The Volvo L25 Electric compact wheel loader has a 40 kWh battery pack.**

LEFT: **The Volvo A40G articulated hauler was also on display at the event.**

Wijaya Karya marks new milestone with Jakarta-Bandung high-speed rail project

With the completion of Jakarta-Bandung high-speed rail (HSR) in Indonesia, PT Wijaya Karya (Persero) Tbk (Wika) has achieved a new milestone. This is the first HSR line in the Southeast Asia region, which was inaugurated on 2 October 2023.

Wika was the only main contractor from Indonesia commissioned on the project, joining a consortium of foreign contractors with a long experience in building high-speed rails in various countries.

The new HSR spans 142.3 km in length, significantly reducing travel time between Jakarta and Bandung cities from three hours to less than an hour. It has four stations – Halim, Karawang, Padalarang and Tegalluar – with a depot in Tegalluar.

Agung Budi Waskito, president director of Wika, said that the project provided an opportunity to facilitate knowledge transfer to the Wika Group, especially in the field of high-speed rail construction.

Wika has built three of the HSR stations, including Halim, Karawang and Padalarang stations. In addition, the contractor worked on subgrades, bridges, slab tracks, pier columns and box girders. Wika's subsidiaries – Wika Gedung, Wika Beton and Wika Construction Industry – also participated in the project.

Wika shared that one of the new construction techniques learned through the project is the implementation of cast-in-situ method for full-span girders. Instead of casting the concrete in stages per segment (as typically done in Indonesia), the casting work for this HSR was carried out all at once and simultaneously. Wika was tasked with building 137 full-span box girders.

Wika Beton took part in the production of 14,786 units of slab tracks, which is another new technology for Indonesia. These slab tracks are used in place of ballast tracks for trains with speeds of more than 350 km/hr and on several bridges. According to Wika, by adopting the technology from China, the slab tracks could be manufactured to a high-quality standard that will offer comfort, stability, greater cost efficiency and relatively easy maintenance for the railway.

Wika Beton was further involved in providing concrete structures, such as piers, girders, pile caps and bored piles, which have been adapted to the environmental conditions at each bridge construction site. Wika said the quality of the concrete also meets the required specifications, which comprise 'pasir tayang' (tayang sand) from Kalimantan in order to ensure the concrete's durability (expected to last up to 100 years).

Wika Gedung, which specialises in building construction, participated in the construction of Halim and Karawang stations as well as the auxiliary building at Padalarang station.

Meanwhile, Wika Construction Industry took part in the steel fabrication and erection process at Halim, LRT-HSR integration and Karawang stations, plus the installation of sound barriers on the rail track.

Mr Waskito highlighted that Wika's successful participation in this HSR project will allow the group to become a leader in the development of modern rail construction in Indonesia. ■

Both images: Wika

ABOVE: **This is the first high-speed rail (HSR) line in Southeast Asia, connecting Jakarta and Bandung in Indonesia**

LEFT: **Spanning 142.3 km in length, the new HSR has four stations and a depot.**

Manitou inaugurates new logistics centre in India

Manitou Group has inaugurated its new spare parts logistics centre in Greater Noida, India. This new facility meets the group's strong ambitions to develop its production and distribution activities in the region over the coming years.

Located on the outskirts of New Delhi in India, the new logistics centre is designed to support Manitou's growth in this high-potential market. The spare parts stocked in this warehouse will be dedicated to the maintenance of machines manufactured at the group's Indian plant, also located in Greater Noida. They will be shipped mainly to Asia, but also to South America and Africa, where Indian-made compact track loaders, telehandlers and backhoe loaders are distributed.

The new logistics centre has quadrupled in size to over 8,300 sq m, enabling Manitou to ship 90,000 order lines a year at maximum capacity. To ensure this daily quality of service, 40 employees will work in shifts at the new facility. Launched in January 2023, the project was completed in less than a year.

"This new logistics centre will enable us to continue improving the service we provide to our customers in this region, where the group has great ambitions. This warehouse will also benefit from the process and flow management standards already in place in our other logistics centres, to optimise the safety of our employees and carriers," said Pierre-Yves Malgogne, vice president of the spare parts business unit at Manitou.

At present, Manitou has eight logistics centres around the world to make spare parts available to all its customers. ■

FAR LEFT: **Manitou celebrates the opening of its new spare parts logistics centre in Greater Noida, India.**

LEFT: **The spare parts stocked in this warehouse will be shipped mainly to Asia, but also to South America and Africa.**

Singapore's first Vision+ MRT 2660 telehandler goes to Lian Hup

The first Vision+ MRT 2660 rotating telehandler from Manitou Center Singapore (MCSG) has arrived in Singapore and was officially handed over to Lian Hup Brothers Pte Ltd.

Kelvin Tan, senior sales manager of MCSG, together with Shao-Kun Wan, assistant sales manager of MCSG, presented the machine to Alex Chua, CEO and director of Lian Hup Brothers.

The Manitou MRT 2660 is designed to be highly versatile, combining the functions of three different machines into one, including a telescopic handler, winch, and aerial work platform.

This rotating telehandler is smart, ergonomic and comfortable, making it ideal for use in construction and industrial applications.

The MRT 2660 has a maximum lifting height of 25.90 m, a maximum capacity of 6,000 kg, and an outreach of 21.70 m while maintaining precise control over the loads, thanks to its pentagonal boom section and excellent 360° visibility.

The 360° rotation feature allows users to perform various tasks without having to move the machine. It can be operated on tyres or stabilisers, which provide a larger support surface for safe working.

"We are excited to hand over the key of the first Vision+ MRT 2660 to Lian Hup Brothers Pte Ltd," said Mike Chen, general manager of MCSG. "Manitou Center Singapore is looking forward to developing the rotating telehandler concept with Lian Hup Brothers for the Singapore market." ■

The handover of Manitou Vision+ MRT 2660 rotating telehandler to Lian Hup Brothers.

Sinar Mas and Samsung C&T collaborate to develop smart city in BSD City, Indonesia

In its effort to transform BSD City into an integrated smart digital city, Indonesian developer Sinar Mas Land has formed a partnership with South Korean construction giant Samsung C&T. Through Samsung C&T's Engineering & Construction Group (Samsung C&T-E&C Group), this collaboration aims to drive the development of smart cities in Indonesia.

A memorandum of understanding (MOU) was signed by Sinar Mas Land and Samsung C&T-E&C Group on 26 September 2023 at Samsung C&T's headquarters in Seoul, South Korea. Both companies plan to collaborate on smart home technology, establishment of urban and IT infrastructure, and application of new renewable energy technology.

"Indonesia is currently booming with smart city projects, such as capital relocation and new city development.

Image: Sinar Mas Land

Oh Sechul, CEO of Samsung C&T-E&C Group (left), and Michael Widjaja, group CEO of Sinar Mas Land, signed the MOU on 26 September 2023.

Samsung C&T-E&C Group plans to actively participate in such projects utilising our smart city-related infrastructure technologies and capabilities," said Oh Sechul, CEO of Samsung C&T-E&C Group.

"We set a new bar for smart city development in Indonesia through the BSD City. The governments see it as a benchmark of how they want to build the new capital city," said Michael Widjaja, group CEO of Sinar Mas Land. "We will bring the technologies in this collaboration into our townships in Greater Jakarta area, Batam, Surabaya, and Balikpapan which is close to the Nusantara capital city."

BSD City has been developed since 1989 and Sinar Mas Land is transforming the township into an integrated smart digital city. In addition to using advanced technologies, BSD City and other Sinar Mas Land projects are developed in line with environmental, social and governance (ESG) principles. This effort is part of Sinar Mas Land's commitment to create sustainable smart cities in Indonesia. ■

Ampd Energy partners Aver Asia in bid to cut carbon emissions at Singapore construction sites

Ampd Energy has teamed up with Aver Asia, a wholly owned subsidiary of Japan's Sumitomo Corporation, in a move aimed at displacing thousands of diesel generators and reducing carbon emissions at construction sites across Singapore.

Despite pandemic constraints, Ampd Energy has successfully deployed over 40 units of its battery energy storage system (BESS) across more than 25 construction sites in Singapore, continuing to ramp up its business in the country through Aver Asia.

Ampd Energy's BESS – called the 'Enertainer' – is a next-generation alternative to diesel generators which are commonly used at construction sites. These diesel generators are known to be highly pollutive, releasing not just carbon dioxide into the atmosphere but also air pollutants and excessive noise.

The Enertainer, on the other hand, is a plug-and-play, fully automated, fully electric battery system that can power the most demanding construction tasks including moving heavy equipment like cranes, hoists and welders. It is much cleaner to operate with up to 90% lower carbon emissions, up to 99% lower air quality emissions, and 30 times quieter noise levels, according to Ampd Energy.

The 40 Enertainers operating in Singapore today prevent over 8,000 t of carbon dioxide emissions from the real estate and construction sector each year. Ampd Energy believes that at scale, the Enertainer can eliminate 400,000 t of carbon dioxide every year from the construction sector alone – comparable to the emissions of 160,000 four-room HDB flats.

According to statistics from Singapore's Building and Construction Authority (BCA), the building sector accounts for one-fifth of all carbon emissions in the country, and sustainable construction has gained urgency in recent years with the government implementing a host of measures including Green Mark certification and grants, to help the industry go clean and green.

Aver Asia, a major equipment rental company based in Singapore, has been serving the construction, infrastructure, marine, offshore, and oil and gas sectors in Southeast Asia for the last 24 years.

Brandon Ng, co-founder and CEO of Ampd Energy, and Ben Koh, CEO of Aver Asia, have recently signed an agreement which will see Aver Asia handle both rental and sales of the Ampd Enertainer in Singapore.

Both images: Ampd Energy

ABOVE: **CEO of Aver Asia, Ben Koh (on the left), and co-founder and CEO of Ampd Energy, Brandon Ng, with Ampd Energy's flagship battery energy storage system, the Enertainer.**

LEFT: **The contract signing ceremony between Ampd Energy and Aver Asia was held on 16 October 2023 in Singapore. With this partnership, Aver Asia will handle both rental and sales of the Enertainer in the country.**

Mr Ng said, "We are delighted to partner with Aver Asia to expand our reach within Singapore. Replacing diesel-powered generators with our battery energy storage system is the quickest and most effective solution to achieving sustainability targets. Together with Aver Asia, we will not only be speeding up the decarbonisation of construction, we are also raising productivity and supporting Singapore's net zero targets."

"With Aver Asia's proven track record, we are assured that our existing and new customers in Singapore will now have easier access to our unique solution to make their construction clean and quiet," added Mr Ng. He further mentioned that Aver Asia was chosen as Ampd Energy's partner due to its strong reputation in innovation, sustainability and customer service.

Aver Asia's Mr Koh commented, "We are proud to be chosen as the exclusive distributor for the Ampd Enertainer in Singapore. This collaboration underscores a shared commitment to greener practices, benefitting both businesses and the environment. Through our extensive network, we hope to raise awareness of the Enertainer and drive down carbon emissions in construction."

Customers can now rent or buy the Enertainer, which Ampd Energy said can be operated viably in Singapore without subsidy or grants. The company also pointed out that most users can enjoy operational cost savings of 10 to 40% by switching. ■

Mapei Far East appoints new general manager

Mapei Far East Pte Ltd has appointed Henson Liong as its new general manager, with effect from 2 August 2023. Based in Singapore, Mr Liong has extensive experience in the local construction industry as well as regional markets, especially in the paints and coatings business. He brings strong commercial skills and extensive business acumen.

Mr Liong spent nearly 20 years of his career at one of the world's leading paint and coating companies. He held various leadership positions in commercial and business development that spanned across a wide spectrum of channels, including retail, projects and export markets like Cambodia, Brunei and Batam (Indonesia).

In addition, Mr Liong had spent eight years with established building contractors active in repair and redecoration/repainting of major projects, where he had held management positions as director for business development, sales and marketing.

According to Mapei Far East, the company has achieved "a very strong net sales growth at the moment and we strive to continue this momentum. We are excited to work together with Mr Liong to realise our ambition in further expanding Mapei's success in Singapore." ■

Henson Liong joins Mapei Far East as its new general manager, based in Singapore.

MyCrane invests in India as expansion continues

Online crane rental platform MyCrane has launched its wholly-owned operations in India. This news was announced recently at the Conex construction trade show, which took place in Gandhinagar, Gujarat, from 21 to 23 September 2023.

Substantial investment from a Series A round has facilitated a global rollout of MyCrane, which uses tech solutions to drive efficiency in the wider construction sector. Its most well-known tool is the world's first online crane rental service (www.my-crane.com).

Operations in India will be handled by MyCrane's local partners – Rajiv Waichal, based in Pune, Maharashtra, and Ganesh M. Patil, who is located in Surat, Gujarat. Pan-India expansion will follow in the coming months.

MyCrane's founder and CEO Andrei Geikalo said, "India is forecast to be one of the fastest growing large economies in 2023, and for the next five years. Whether it's a record order of new aircraft from Airbus and Boeing, new semi-conductor facilities being built in Gujarat or countless infrastructure projects in Mumbai, India's rise is not in question.

"This growth is driven by digitalisation – something that's obvious to any visitor here, who will have noticed QR codes at every humble food stall and the huge take-up of mobile phone payments. MyCrane is delighted to be present in one of the world's most exciting commercial markets – at a truly exciting time."

Seasoned industry experts, both Mr Waichal and Mr Patil were previously employed by Reliance Industries Ltd – a multinational conglomerate involved in energy and petrochemicals, among other sectors, and the largest private sector corporation in India.

Mr Waichal oversaw after-sales service for Tadano Cranes Pvt Ltd and was also employed by Terex India Pvt Ltd. Mr Patil is a certified mechanical engineer with two decades of experience working with material handling equipment and heavy commercial vehicles, previously employed by OEMs and crane manufacturers such as Tractors India Limited, Grove and Manitowoc.

FROM LEFT: **MyCrane's Aleksandr Geikalo, Rajiv Waichal, Ganesh M. Patil and Andrei Geikalo. The company's operations in India will be handled by both Mr Waichal and Mr Patil.**

Dubai-based MyCrane currently has more than 3,000 registered customers, and more than 15,000 cranes available to hire at the free-to-use platform. It simplifies the process of crane rental procurement, allowing customers to submit details of their lifting requirements in order to receive personalised quotes from a range of registered asset owners.

Customers of the platform can simply and quickly request a crawler, mobile or tower crane without having to rely on manual processes, such as calling suppliers or making multiple offline requests. Managed by MyCrane's head office team in Dubai, the platform lists cranes for hire with a capacity of between 100 kg and 750 t. ■

Lintec & Linnhoff consolidates Eurotec brand into Lintec brand

As part of Lintec & Linnhoff's continuing globalisation, the company has announced its strategic decision to consolidate the Eurotec brand into the Lintec brand. As a result of this change, Eurotec machines will be sold under the Lintec name, with Lintec branding.

Effective 9 November 2023, this change will apply to all global markets and reflects Lintec & Linnhoff's commitment to bring the speed, productivity and ease-of-maintenance benefits of the Eurotec product range to a wider customer base.

Daniel Chan, chairman of Lintec & Linnhoff Holdings, said, "We are excited to announce this consolidation and are confident that our customers will appreciate being able to purchase the plants under the Lintec name, while also enjoying the higher residual value that Lintec plants command. Furthermore, we intend to gradually integrate more technology from our German design centre into the newly branded Lintec concrete batching plants, giving them further appeal."

Established as part of the Lintec & Linnhoff Group nearly 35 years ago in 1988, Lintec's brand heritage is founded on state-of-the-art German technology that incorporates high standards of craftmanship, precision and durability. Offering the highest quality of solutions, Lintec is transforming, inspiring and changing lives by bringing sustainable infrastructure across its range of asphalt mixing plants, as well as its concrete batching plants, to communities across the globe.

ABOVE **The Lintec ECP Eco concrete batching plant is eco-friendly and produces high-quality concrete in large quantities.**

RIGHT: **The Lintec UCP Ultra concrete batching plant is for bigger concrete needs for projects requiring thousands of cubic metres a day.**

New generation of concrete batching plants

The new generation of Lintec plants will provide customers in key Lintec & Linnhoff markets – such as Southeast Asia, Latin America, Eastern Europe, Middle East and Africa – with access to new Lintec products, further complementing existing models.

This includes the Lintec ECP Eco, which is ideal for customers requiring an eco-friendly batching plant capable of delivering a large quantity of high-quality concrete. The new Lintec UCP Ultra is for bigger concrete needs for projects requiring thousands of cubic metres a day. Meanwhile, the Lintec PCP Portable offers easy and economical transportation and on-site installation.

Lintec & Linnhoff highlighted that "the new generation of plants will enhance overall performance and capacity levels, while also providing powerful and innovative solutions that meet industry standards for environmental impact, recyclability and reusability. This includes fully cladded plants to reduce pollution, noise levels and our overall impact on the climate and the communities our customers serve." ■

The Lintec PCP Portable concrete batching plant can be transported quickly and economically installed at the job site.

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Bangladesh's first underwater tunnel officially opens

The Bangabandhu Sheikh Mujibur Rahman Tunnel – the first underwater tunnel in Bangladesh – was officially inaugurated on 28 October 2023. Owned and managed by the Bangladesh Bridge Authority, this 3.4-km-long, 11-m-diameter twin tunnel in the port city of Chattogram will play a vital role in connecting the different parts of the country and promoting economic growth.

SMEC was appointed in 2017 to undertake design review, contract management and construction supervision for the project. The tunnel was built by China Communications Construction Company under an EPC contract and SMEC led a joint venture supervision team which included ACE, COWI and DevConsultants.

The presence of soft soil in the riverbed, and an elevated water table made this a highly complex tunnelling operation, said SMEC. Passing 20 m under the Karnaphuli river, reaching 31 m deep, it is touted as the first slurry shield under-river road tunnel in South Asia.

The ARiGATAYA system was used for data collection and management of the TBM works. It provided the SMEC team with vital information needed to make important decisions related to the operation of the TBM.

ABOVE AND RIGHT: **The new 3.4-km-long Bangabandhu Sheikh Mujibur Rahman Tunnel in Bangladesh will play a vital role in connecting the different parts of the country and promoting economic growth.**

Image: Sahidul Jaman Saju

ABOVE: **The entrances of the tunnel are built to withstand cyclonic tidal surges that are common in the Bay of Bengal.**

LEFT AND ABOVE LEFT: **A toll plaza, a 730 m viaduct and 5.4 km of approach roads are also part of the project. Other facilities include an overload control system, a 65 ha mixed-use service area and a slurry treatment plant.**

According to SMEC, it was critical to achieve watertightness throughout construction as well as during operation. Approximately 1,225 precast concrete rings have been installed to line the tunnel, each with a width of 2,000 mm and a thickness of 500 mm. The entrances of the tunnel are built to withstand cyclonic tidal surges that are common in the Bay of Bengal.

Nestled 20 m below the riverbed, the tunnel is also fitted with world-class safety and control systems to enable smooth traffic flow. A central control centre will monitor the tunnel in real time, with the ability to activate controls remotely to respond to changing conditions or any incidents that occur. The tunnel is capable of servicing approximately 28,000 vehicles a day.

In addition to the tunnel, the project features several interfacing infrastructure nodes including 5.4 km of approach roads, a 730 m viaduct, a toll plaza, overload control system, a 65 ha mixed-use service area, and a slurry treatment plant.

With the construction team peaking at over 2,000 people on site, SMEC was tasked with implementing a comprehensive management framework which extended to document control, quality assurance, safety, environmental management, and risk assurance. The team also had to navigate severe disruptions caused by the global pandemic.

Dr Janardhan Sundaram, SMEC executive director Bangladesh, said, "The tunnel is a game-changer for economic development in the region. It will ease traffic congestion and significantly reduce travel times between Dhaka, Chattogram Port and the developing growth area in southeast Bangladesh."

Gavin Strid, SMEC chief technical principal and project manager, added, "The Bangabandhu Sheikh Mujibur Rahman Tunnel enabled the training of over 50 local Bangladeshi engineers. The project's success has given the government confidence in the slurry shield methodology which is currently being deployed on other mega projects in the country, including the Dhaka Metro." ■

Passing 20 m under the Karnaphuli river, reaching 31 m deep, the Bangabandhu Sheikh Mujibur Rahman Tunnel is touted as the first slurry shield under-river road tunnel in South Asia. SMEC was appointed to undertake design review, contract management and construction supervision for the project.

The presence of soft soil in the riverbed, and an elevated water table made this project a highly complex tunnelling operation.

Image: Sahiduj Jaman Saju

Image: Sahiduj Jaman Saju

ABOVE: **Approximately 1,225 precast concrete rings have been installed to line the tunnel.**

LEFT: **A tunnel breakthrough ceremony for the project.**

Image: Sahiduj Jaman Saju

All images: SMEC (unless stated otherwise)

CALENDAR OF EVENTS

// Events in Asia

CICEE Southeast Asia
29 Nov to 1 Dec 2023
Malaysia International Trade and Exhibition Centre
Kuala Lumpur, Malaysia
Website: www.ciceesea.com

Excon India
12 to 16 Dec 2023
Bangalore International Exhibition Centre
Bengaluru, India
Website: www.excon.in

Japan Build
13 to 15 Dec 2023
Tokyo Big Sight
Tokyo, Japan
Website: www.japan-build.jp

Geo Connect Asia
6 to 7 Mar 2024
Sands Expo & Convention Centre
Singapore
Website: www.geoconnectasia.com

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

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

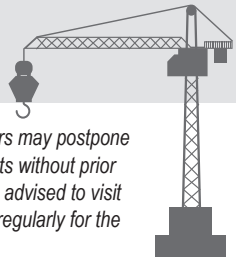
CBA Expo (ConsBuild Asia)
22 to 24 Aug 2024
Bangkok International Trade & Exhibition Centre
Bangkok, Thailand
Website: www.consbuildasia.com

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

// Events outside Asia

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

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



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

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BICES 2023 sets 'new records'

The 16th China Beijing International Construction Machinery, Building Material Machines and Mining Machines Exhibition & Seminar (BICES 2023) recently concluded, drawing approximately 1,320 exhibitors from over 30 countries and regions.

Held at the China International Exhibition Centre (Shunyi Venue) in Beijing from 20 to 23 September 2023, the event covered about 150,000 sq m of exhibition area. It attracted more than 300,000 visitors (onsite and online), with over 150,000 visitors from over 70 countries and regions attending onsite.

According to the organiser, BICES 2023 has reached "historic highs in terms of both scale and effectiveness, and set new records in its 30-year history." The theme for this year's event was 'Digital, Efficient, Green and Reliable'.

BICES 2023 featured various sustainable, environment-friendly machines and equipment, supporting the industry's energy transition. Among the major exhibitors at the event was LiuGong, which displayed 43 products, including 16 electric series and three hybrid machines. In addition, Zoomlion presented 19 products, 10 of which were 'green' machines that offer not only zero emissions and reduced operating costs but also multiple safety protections.

Sany introduced 22 machines, 13 of which were electric-powered models. The SW956E electric loader, with a rated load capacity of 5.8 t, is equipped with a self-developed VCU control system and electric drive powertrain, matched with a two-speed sleeve gearbox and single-handle pilot control system, combining the stability of traditional loaders with the rapid response of electric loaders.

ALL IMAGES: **BICES 2023 drew approximately 1,320 exhibitors from over 30 countries and regions as well as more than 300,000 visitors (onsite and online).**

Another major exhibitor was XCMG, which showcased its XCA300L8-HEV hybrid crane. The company also unveiled a new range of large-tonnage, high-voltage lithium-ion forklifts under its Peacock series, as well as the XGE105 and XDR80TE-AT electric mining trucks, XC968-EV electric loader, XE215E electric excavator, HB62VH hybrid pump truck, and G4802BIIVE electric mixer truck.

With the theme of 'Green Equipment, Smart Future,' Taihe Group revealed its ambition to enter the construction machinery industry at BICES 2023. The company launched a variety of environment-friendly and intelligent products at the event. It is currently researching and developing hybrid power, electric, hydrogen, methanol-powered equipment, and more. ■

Website: www.e-bices.org

Thailand's inaugural CBA Expo concludes

CBA Expo, Thailand's trade exhibition and conference for machinery, tools, equipment and technology for the construction, mining and building industries, has concluded its first edition from 13 to 15 September 2023 at Bangkok International Trade & Exhibition Centre (BITEC). The event covered 4,000 sq m of indoor area and 400 sq m of outdoor area.

According to the organiser, MB Global Marketings, CBA Expo 2023 drew over 2,000 trade visitors and hosted 60 brands and companies from Thailand, India, Germany, Russia, Malaysia and Singapore. During the event, there was also a business transaction totalling approximately US$1 million.

Ekapat Wangsuwan, Deputy Permanent Secretary of the Ministry of Industry (Thailand), spoke at the opening ceremony. He pointed out that "modern technologies and innovations will be the key to enhancing the business capabilities of Thai construction industry operators at all levels to meet international standards. [These modern technologies and innovations] are able to surmount industrial sector obstacles and problems, such as rising construction costs due to the increase in costs of building materials."

"The introduction of modern machinery, technologies and innovations also serves as a method to care for society and the environment, including addressing labour shortages and other issues," added Mr Wangsuwan.

Sirapop Tantitham, managing director of OCR Company Limited, a distributor of heavy machinery under the XCMG brand, further mentioned that "the domestic construction industry is experiencing a period of growth. It is a contributor to environmental problems. The objective of OCR is to generate commercial success, [and the company] is prepared to take care of society and the environment on a global scale."

The next edition of CBA Expo, which is also known as ConsBuild Asia, is scheduled take place from 22 to 24 August 2024 at BITEC in Bangkok, Thailand. ■

Website: www.consbuildasia.com

ALL IMAGES: **The inaugural CBA Expo was held in Bangkok, Thailand, covering 4,000 sq m of indoor area and 400 sq m of outdoor area. The event drew over 2,000 trade visitors.**

IPAF extends eLearning programme to China

The International Powered Access Federation (IPAF) has launched its eLearning programme for operators of mobile elevating work platforms (MEWPs) in China.

Celebrating its 40th anniversary in 2023, IPAF promotes the safe and effective use of powered access equipment worldwide and offers globally-recognised eLearning for MEWP operators.

The announcement of the extension of online training to the Chinese market came as delegates gathered in Shanghai for the International Rental Conference Asia and the APEX Asia trade show.

Peter Douglas, IPAF CEO and managing director, said, "China is the fastest-growing equipment market in the world, with a huge rental fleet comprising hundreds of thousands of machines, as well as nearly five million MEWP operators.

"A growing sector naturally means more operators, and it is very important to us that industry colleagues are equipped with the knowledge and skills to stay safe and work effectively.

"We hope that extending this training to China will herald a new era of safety in the country's powered access sector."

IPAF's Chinese eLearning programme provides a flexible and enhanced online learning experience for MEWP operators. The training platform will be offered in China via the WeChat app, allowing users to access training anytime and anywhere. The first three modules are offered free of charge at the point of registration.

The MEWP Operator programme is available for all MEWP categories (1a, 1b, 3a, 3b) and takes around three hours to complete. The eLearning is broken down into manageable sections that trainees can complete at their own pace and can save and resume their training at any time.

Remote learning delivers the same high-quality theory training as in the classroom and can be completed on a range of devices, at a pace chosen by the trainee.

The eLearning system uses sophisticated facial recognition to confirm the candidate's identity and prevent fraudulent qualifications. Courses can only be run on tablets and computers equipped with a camera.

IPAF eLearning programme for MEWP operators is now available in China.

"Offering the training in Chinese will help to ensure that the important safety principles covered by the programme are fully understood and embedded in the workforce," said Tim Mo, IPAF China regional manager.

"As the Chinese equipment market continues to grow, it is essential that industry takes a lead in ensuring safety and providing access to high-quality training. Members of the global workforce are positive about IPAF's training, with more than 500 new learners signing up each week. We hope this trend will continue in China thanks to this new training provision."

MEWP manufacturers Sinoboom and Haulotte Shanghai have already signed up as the first supporters of the eLearning programme in China. IPAF hopes and believes more and more parties will join.

Alongside the new eLearning provision, IPAF currently has 10 approved training centres in China, and hopes the new online provision will encourage more to open in the next five years.

In addition to Chinese, the IPAF MEWP Operator eLearning training course is available in English, Dutch, French, German, Italian, Portuguese and Spanish. ■

Website: www.ipaf.org/en/ipaf-elearning

IPAF launches Women in Powered Access webinar series

IPAF is holding a series of webinars as part of its Women in Powered Access initiative, the first one of which focused on 'Women in Leadership' and was held on 20 September 2023.

The Women in Powered Access initiative was launched in 2021 and aims to recognise and celebrate the contributions of women in powered access, as well as outline career pathways for women already in the industry and those looking to enter it.

The webinar will explore what it means to be a woman in leadership today, what makes a good leader, and busting some myths around leadership.

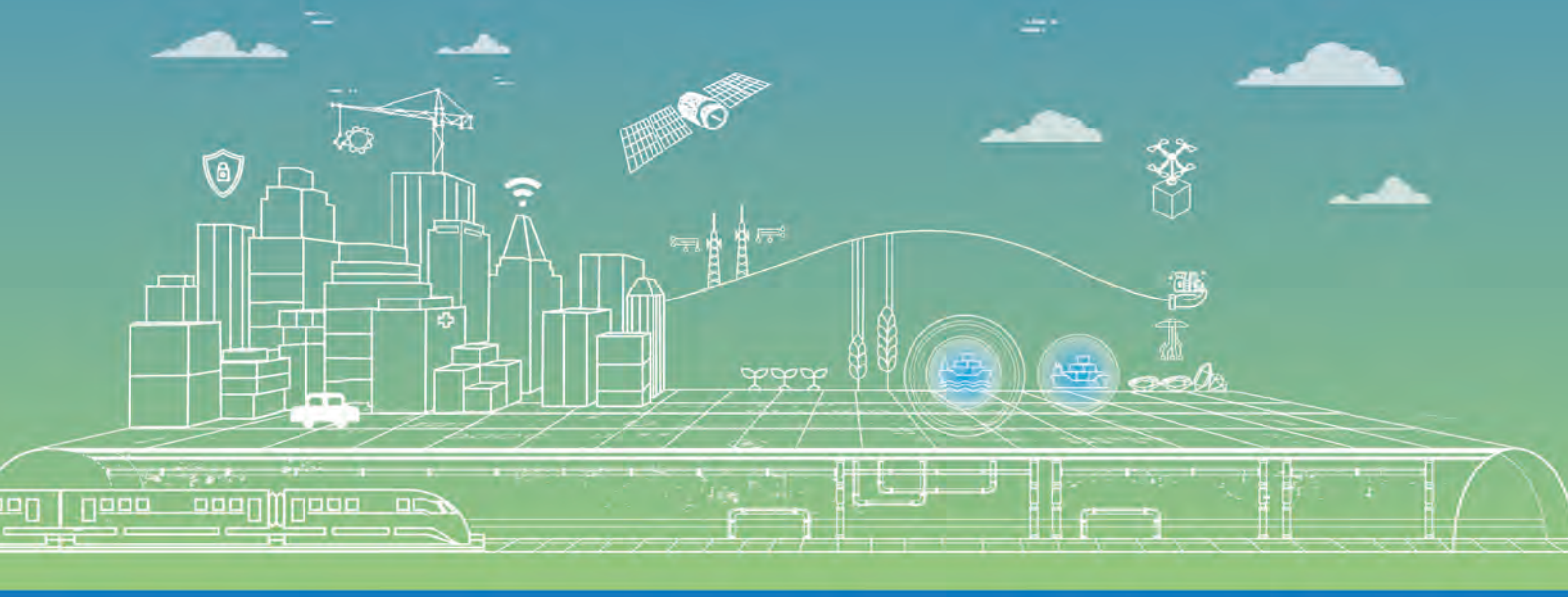
Hosted by Ali Moore, an experienced leadership development consultant and joined by a panel of senior figures from across the industry: Debbie Hameetman, director of people process and digital technology EMEAI (JLG); Oana Samoila, key accounts sales manager (AlmaCrawler) and Vicki Allen, managing director (International Platforms). The panellists will discuss their experiences and highlight takeaways for aspiring leaders.

The webinar complements the initiative's other activities which include a mentoring scheme for women in the industry, stories of women in different roles across the sector and the first women in powered access networking event.

Karin Nars, president of IPAF, commented, "It is great to see the development of the initiative so far, and the momentum and engagement we have had. The webinars aim to really focus on key issues for women in the industry. They aren't just for women, but also an opportunity for their male colleagues to learn about experiences of women in the industry. I look forward to seeing members taking part and coming away with key takeaways and ideas they can bring into their workplace and working lives."

Ms Moore added, "It is a privilege to be part of this first webinar focusing on women in leadership, and we already have a global audience registered to attend. I hope this will provide valuable insight and will inspire many more aspiring women leaders." ■

GEO CONNECT Asia 2024



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Newly upgraded electric vertical mast lift from Dingli

Dingli has introduced its upgraded AC vertical mast lift, the AMWP11.5-8200AC, featuring a maximum working height of 11.2 m and maximum load of 200 kg.

This compact, electrically powered machine is equipped with a fully enclosed AC system, which the company said is maintenance-free, more waterproof, more efficient and safer, combined with maintenance-free batteries.

According to Dingli, the maximum working height of the AMWP11.5-8200AC is 1.20 m higher than equivalent products in the market. The machine also has special fork loading holes to enable easy transport.

The AMWP11.5-8200AC is ideal for use in narrow spaces and can be driven at full height. Its platform basket width has been increased, and its full-height gate has been upgraded to allow for easier access without bending.

In addition, the AMWP11.5-8200AC is fitted with a pothole protection system for greater safety, and the machine offers a 3 m horizontal extension. This new vertical mast is suitable for various work sites, including indoor applications in places such as warehouses, supermarkets, hotels, airports, and those with narrow aisles. ■

Website: https://en.cndingli.com

The new Dingli AMWP11.5-8200AC vertical mast lift features a maximum working height of 11.2 m and maximum load of 200 kg.

The new vertical mast has special fork loading holes to enable easy transport.

This electrically powered vertical mast is compact, making it ideal for use in narrow spaces.

Hydronix launches new water controller for concrete production

Hydronix, a global leader in microwave moisture measurement sensors, has released the latest version of the Hydro-Control (model HC07) – a 10.1-in touchscreen water controller compatible with the Hydro-Mix and the Hydro-Probe Orbiter.

The Hydro-Control is a stand-alone unit designed to accurately add water into a mixer, including weighed, metered, and timed methods. Different operating modes can be chosen for each recipe, enabling the most suitable option to be selected. Over 99,000 recipes can be stored.

This latest version of the Hydro-Control enables connection to a control system via ethernet, Web API or an RS232 serial link. It is now possible to secure remote access through a web browser.

"At Hydronix, we understand our customers' challenges and data connectivity is becoming vital. We have updated the Hydro-Control with connectivity in mind, and the updated unit provides a flexible connection to control systems and PC," explained Neal Cass, sales manager at Hydronix.

The new Hydro-Control (HC07) has been designed for simplicity of use and integration; the colour display clearly indicates the mix cycle status with a continuous graphical display of moisture content. The touchscreen interface completes the intuitive look and feel of the unit. The Hydro-Control stainless steel body mirrors the other interfaces already available, such as the Hydro-View.

"The Hydro-Control uses a Linux OS and has had a major overhaul of its user interface whilst remaining familiar to existing Hydro-Control VI users. It is more intuitive and easier to use," said Mr Cass. "It was important to us that our customers have a better experience with the unit and that the look and feel are like our other products." ■

Website: www.hydronix.com

This new Hydro-Control enables connection to a control system via ethernet, Web API or an RS232 serial link. It is now possible to secure remote access through a web browser.

The latest version of Hydronix Hydro-Control (model HC07) has been designed for simplicity of use and integration.

Tadano adds more features to AC 5.250-2 crane

Tadano unveiled its new AC 5.250-2 at bauma 2022. As part of the final stretch of development for the crane's launch, the company has now outfitted the machine with additional features, particularly in the area of safety.

This five-axle all-terrain crane offers a maximum capacity of 250 t. It has a main boom length of 70 m, which can be extended by 42 m with an HAV main boom extension, allowing it to reach a system length of 112 m. According to Tadano, all available main boom extensions from 5.8 to 36 m are self-rigging.

The AC 5.250-2 features a lifting capacity of 14.5 t with a 70-m boom length at a radius of 12 to 24 m, and a lifting capacity of 11 t with a boom length of 47 m at a radius of 42 m.

A number of transportation configuration options are available for the AC 5.250-2. For instance, the crane can carry a three-sheave hook block for lifting loads of up to 67.3 t or a 5.8-m heavy-lift runner on board while remaining within a 12-t axle load configuration – not to mention that the transportation mounts for the HAV extension are included by default in the 12-t axle load.

Tadano said the AC 5.250-2 can be used as a taxi crane without a support vehicle while remaining within the legal axle load limit of 12 t. And if the axle load is increased to 16.5 t, it can also carry up to 20 t of its maximum counterweight of 80 t.

Key highlights

The AC 5.250-2 can pick up its total counterweight of 80 t in three lifts: 46.6 t with a full 360° radius of up to 6.2 m followed by two lifts of 15.2 t, with each split into 10 and 5.2 t for mounting on the right and left of the base package. If necessary, the counterweight can be split into smaller pieces as well, making it possible, for example, to pick up the 5.5-t base plate from a distance of up to 20.1 m across the full radius.

The IC 1 Plus control system determines the crane's maximum lifting capacity for every boom position as a function of the superstructure's slewing angle, and in real time to boot. Thus, the crane is always able to take advantage of the maximum lifting capacity available to it – especially during lifts over the outriggers. The outriggers can be extended asymmetrically to 0, 25, 50, 75, and 100% positions.

Using the Surround View camera system, the operators can optimally position the crane at work sites. This system uses six cameras to show a computer-assisted diagram of the maximum possible extension lengths for the outriggers at the crane's current location.

The AC 5.250-2 is powered by a Mercedes-Benz engine with an output of 522 hp and a maximum torque of 2,600 Nm. The HVO-compatible diesel engine meets the latest EU Stage V requirements. It is also cost-effective thanks to the Eco Mode, which ensures that the engine always outputs the exact amount of power that the crane actually needs at any one time, with the IC-1 control system taking care of the corresponding calculations.

Furthermore, the spacious cab is designed for operator comfort. To ensure safety, there are intelligently positioned access points, attachment points for operators' personal safety equipment, and a step that can be extended from the carrier to make it safe and comfortable to enter and exit the superstructure cab.

New safety features

Tadano has now incorporated its TailGuard active backup assist system to maximise safety during travel. This system uses two ultrasonic sensors to monitor the area behind the crane when backing up, and it works regardless of ambient light conditions. It shows the distance from stationary and moving objects in the monitoring area on the cab's monitor, plays an acoustic warning before reaching obstacles, and will stop the crane itself in the event that there is a risk of collision.

The backup assist system is automatically activated the moment the crane's reverse gear is engaged, so the process is very safe – it not only prevents injuries and property damage, but also crane downtimes associated with accidents.

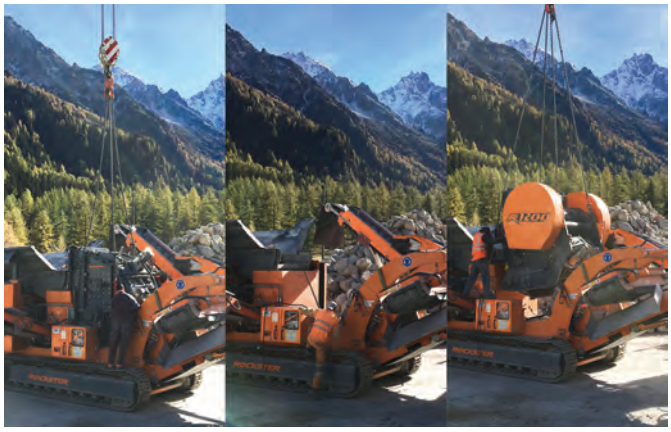
In the future, the AC 5.250-2 will be fitted with another safety feature, Lift Adjuster, revealed Tadano. Scheduled to become available in the coming year, this solution consists of a technical control system that can be activated with the press of a button. It measures the boom's deflection and independently adjusts the lift cylinder in order to compensate for the change in radius caused by the deflection and to eliminate the risk of swinging. This way, the Lift Adjuster significantly improves safety in the crane's work environment. ■

Website: www.tadano.com

ALL IMAGES: **The new AC 5.250-2 has a maximum capacity of 250 t. As part of the final stretch of development for the crane's launch, Tadano has now outfitted the machine with additional features, particularly in the area of safety.**

2-in-1 crusher: Rockster R1100DS can easily transform from impact to jaw crusher

The R1100DS tracked impact crusher from Rockster features an innovative Duplex System, which was developed by the company in 2004. It enables interchangeable crushing units on one basic machine. In this case, the impact crushing chamber can be lifted and in its place a jaw crushing chamber installed.



ABOVE: **The R1100DS crusher features Rockster's Duplex System, which enables interchangeable crushing units on one basic machine.**

LEFT: **By changing its crushing chamber, the R1100DS impact crusher can be transformed into a jaw crusher.**

How does it work?

All Rockster crushers are equipped with a diesel engine and a hydrostatic drive. The latter is what makes a difference and enables the Duplex System to work.

The hydrostatic system is located at the rear of the machine and is enclosed in a soundproofed housing. The hydraulic pump is built directly onto the engine drive, which activates the crusher via a V-belt drive, while the additional hydraulics (for main conveyor, side conveyor, vibration chute and crawler gear) are driven via the auxiliary drives. Because the rotor for the impactor runs in a forward direction and the jaw crusher in reverse, precisely due to the hydrostatic drive, it makes it possible to change the direction of rotation, hence install both crushing units on one machine.

Other advantages of the hydrostatic drive include individual adaptation of the crusher speed and thus optimum adjustment of the screening curve. The conventional clutch is eliminated, which means no wear and most importantly, the hydrostatic pressure adjusts to the power requirements of the crusher, resulting in a highly constant crushing performance and the diesel engine always stays within the optimum speed range.

Full flexibility

Thanks to its Duplex System and compact dimensions, the Rockster R1100DS is ideal for recycling construction and demolition waste as well as for processing natural stone. Powered by a C9.3 Cat engine, the crusher has an optional circular screen box and a double-functional return or stockpile belt to produce a 100% defined final end-product.

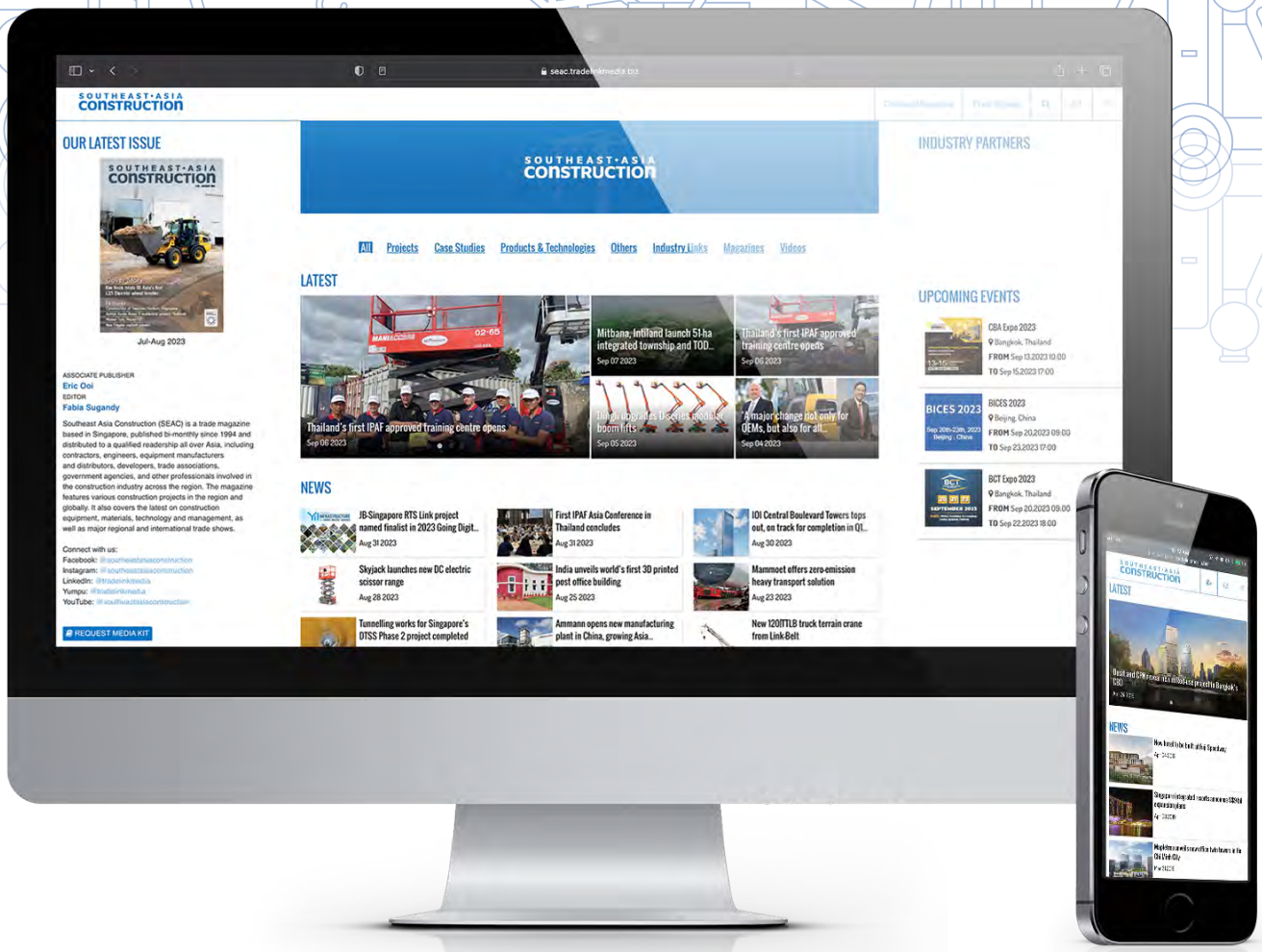
The R1100DS is also designed for simple service and maintenance. Its large engine bay openings enable easy access to the inner workings of the crusher.

Based in Austria, Rockster offers tracked impact and jaw crushers, tracked screening machinery as well as stackers and feeder conveyors. The company has been involved in various global projects and its products are sold in more than 50 countries worldwide. ■

Website: www.rockster.at

ABOVE: **For simple service and maintenance, the R1100DS has large engine bay openings that allow easy access to the inner workings of the crusher.**

RIGHT: **Rockster's R1100DS crusher is ideal for recycling construction and demolition waste as well as for processing natural stone.**



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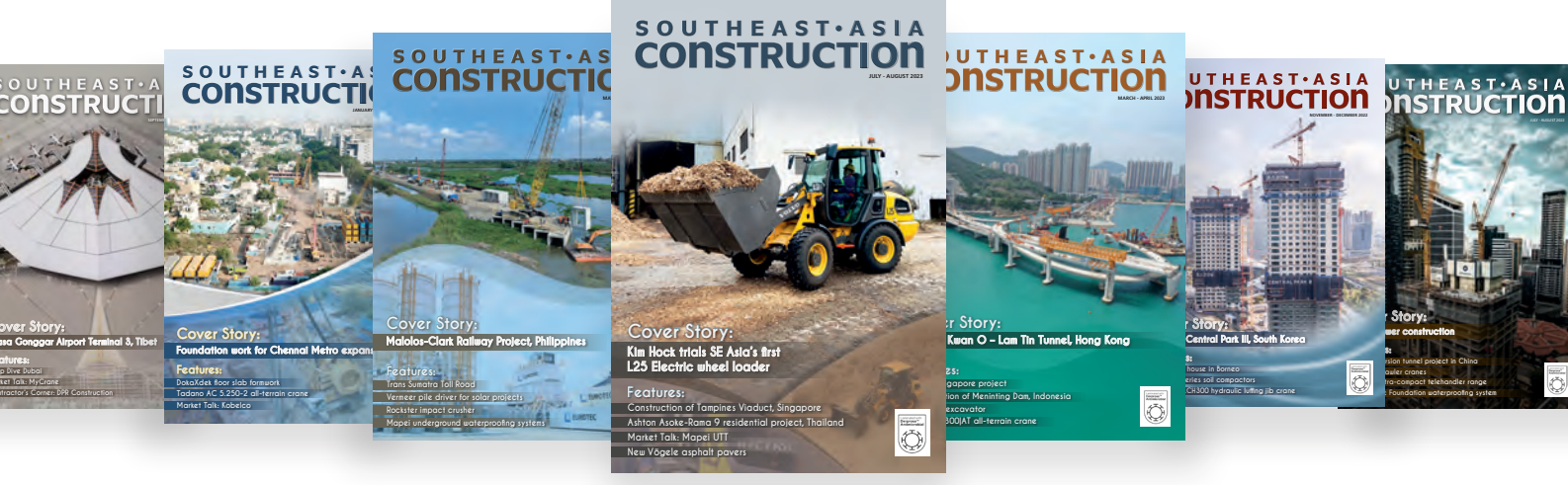

Denzai deploys Enerpac JS-250 jack-up system for bridge removal in Japan

Denzai Engineering Corporation has used an Enerpac JS-250 jack-up system for the removal of a bridge in Narita city, Chiba, Japan. The 150-t overpass road bridge was removed as part of the preliminary work ahead of a planned runway extension at Narita International Airport. Deploying the JS-250 towers, mounted on self-propelled modular transporters (SPMTs), allowed the bridge removal overnight, minimising traffic disruption on the busy Higashi-Kanto Expressway.

The extension of Runway B at Narita International Airport requires the creation of a new grade-separated intersection between the Higashi-Kanto Expressway and the extended section of Runway B. Removal of the bridge will allow the Higashi-Kanto Expressway to be temporarily rerouted during the intersection construction.

The Enerpac JS-250 jack-up system in position to lift the bridge deck.

Lack of space prevented the use of a crane for the bridge removal and so Denzai opted for the JS-250 jack up system due to its lifting capacity, stability and compactness. Two JS-250 towers were mounted on each of two SPMTs and a steel support platform placed on top. The platform was used to support the 21-m-long, 5-m-wide bridge deck as it was lifted and transported to a rigging location near the expressway. This project was carried out in June 2023.

The Enerpac JS-series jack-up system is a multi-point lifting system comprising four jack-up towers, one positioned under each corner of a load. The lifting frame of each jack-up tower contains four hydraulic cylinders, which lift and stack steel barrels. The load is lifted in increments as barrels are inserted via an automated system and stacked, forming the lifting towers. Managed by a single operator, each tower's lifting and lowering operations occur simultaneously, while the jack-up's synchronous technology maintains the balance of the load. ■

Website: www.denzai-j.com / www.enerpac.com

Transporting the bridge to the off-highway rigging location.

POWER PAVER SF-3404 SLIPFORM PAVER

Power Pavers has launched its new full-width, four-track concrete slipform paver, the Power Paver SF-3404. This latest model paves a maximum of 12 m and features telescoping endpans for 61 cm of width flexibility on each end. A heavy-duty plow, rigid paving pans and durable slew drives make the machine highly reliable and efficient.

Also new with the SF-3404 is an optional compact, fully-controlled dowel bar insertion (DBI) system. It is fitted with a hydraulic floating floor to maintain the integrity of the initial slab and improve reconsolidation around dowel bars after the insertion process. Each time the DBI runs, the carriage recalibrates with electronic sensors to ensure the floor is exactly where it should be.

In addition, the DBI is split to allow for accurate crowning and bar placement. Each bar is held and guided into the concrete to prevent skewing, even while crowning. When running DBI, the machine utilises a collision avoidance system to prevent centre tie bars and DBI from inserting at the same location.

To create the smoothest ride possible, Power Pavers said the SF-3404 is equipped with the industry's longest oscillating correctional beam (OCB) for smoothing the slab's surface after dowel bar insertion.

ABOVE: **The new SF-3404 paves a maximum of 12 m and features telescoping endpans for 61 cm of width flexibility on each end.**

RIGHT: **A heavy-duty plow, rigid paving pans and durable slew drives make the machine highly reliable and efficient.**

ABOVE RIGHT: **New with the SF-3404 paver is an optional compact, fully-controlled dowel bar insertion (DBI) system.**

The company has engineered a heavy-duty OCB that is 76 cm tall with a 61 cm finishing length for full coverage over the dowel insertion void. The OCB corrects any surface imperfections with ease. For transportation, the DBI, OCB, OCB wiper and final finisher are contained in a single assembly.

An innovative vibrator cruise control automatically adjusts the machine's vibrators to maintain consistent speed despite fluctuations in oil viscosity or changes in concrete slump. For super-elevations and intersections, an exclusive crown-distance compensation feature provides automated crown transitions between the mould, DBI and OCB.

What's more, the SF-3404 is designed to simplify operators', finishers' and mechanics' jobs. It is equipped with Power Pavers' signature SlipSmart control system for easy, highly configurable machine controls. All machine diagnostics are onboard, with no laptop required. The new system provides fault codes for everything on the paver, including the DBI. Common bolt sizes and colour-coded wiring throughout the machine keep maintenance simple. ■

Website: www.powercurbers.com

TOP: **The SF-3404 is designed to simplify operators', finishers' and mechanics' jobs. It is equipped with Power Pavers' signature SlipSmart control system for easy, highly configurable machine controls.**

ABOVE: **The DBI system is fitted with a hydraulic floating floor to maintain the integrity of the initial slab and improve reconsolidation around dowel bars after the insertion process.**

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BUILDING STRONG FOUNDATION FOR KOTA STATION

Construction of Indonesia's first subway line began in 2013, the MRT Jakarta. For now, Kota Station is the last section of the current phase II of the South-North MRT line. Situated near the old Jakarta Kota train station in the north of the city, the new station Kota will enable better access to the historical old town and business centre as a traffic hub.

To carry out necessary diaphragm wall works for the construction of the new subway station, PT. Bauer Pratama Indonesia – the local subsidiary of Bauer Spezialtiefbau GmbH – was commissioned by client Sumitomo Mitsui Construction Co Ltd in a joint operation with PT. Hutama Karya (Persero) to install the supporting walls for the lower level.

The reinforcement cages were constructed at Bauer Indonesia's workshop and delivered just-in-time to the site.

"Due to the challenging soil conditions, demanding technical requirements and strict location restrictions, we were awarded the contract for this project, which makes us very proud," said Hemanth Narayanan, director at Bauer Indonesia.

Demanding project

One of the major challenges in this project is that the work had to be carried out on a narrow stretch of land between two busy main roads and among historical structures and residential buildings. In addition, two bus lanes had to remain open for traffic during the entire construction period, which meant that work could only proceed on one side of the station at a time.

"The Pantjoran Tea House, a protected cultural building, was less than 3 m away from the site and the diaphragm wall elements had to be installed directly on the property line," explained Mr Narayanan. In total, 136 diaphragm wall elements were constructed with a thickness of 1,200 mm or 1,400 mm over a length of 867 mm.

Due to the challenging subsoil consisting of soft to moderately firm clay at a depth of 7 m to 8 m, the panels were installed between 33 m and 43 m deep. The total area of the diaphragm walls constructed was nearly 29,500 sq m. The work was performed using a Bauer GB 50 hydraulic grab and a Bauer MC 86 duty-cycle crane.

During the work, a polymer slurry was used to stabilise the excavated trenches. To inspect the quality of the slurry continually and comply with the requirements concerning verticality, regular tests were conducted. Because of the extremely limited site area,

A Bauer BG 50 hydraulic grab during work near the Pantjoran Tea House, a protected cultural building.

an adjacent property was also rented to set up the slurry plant and the stabilising slurry was transported onto the site via pipelines up to 360 m in length.

The reinforcement cages needed to stabilise the completed diaphragm wall elements were constructed at Bauer Indonesia's workshop, which is located 40 km from the site. "A heavy haulage transport with police escort was organised every night after 10 pm for just-in-time delivery of the completed reinforcement cages onto the site," said Mr Narayanan.

"In addition, special reinforcement cages made of fibreglass-reinforced plastic had to be installed on the two curved sides of the station, since a tunnel boring machine will be used to construct the subway tunnels." The construction and installation of the special reinforcement cages required particular caution, as the material is extremely brittle and rigid.

The work began in December 2022 and was completed in June 2023. During the entire execution period, work sequences had to be followed strictly in order to keep from jeopardising the production schedule of the reinforcement cages. The particular location amidst buildings with protected monument status also called for highly cautious and low-vibration work methods in a very tight space.

Bauer added that because the work took place in the historical city centre of Batavia, objects such as ceramics, wood stakes and mussels were occasionally found. "Although we were faced with some challenges during this project, we were able to complete the work on time and without incident," said Mr Narayanan. ■

Website: www.bauer.de

All images: Bauer Group

The site team from Bauer Indonesia at the MRT Kota Station project.

JABODEBEK LRT

A solution to Jakarta's traffic woes

Phase 1 of the Jabodebek light rail transit (LRT) system in Jakarta, Indonesia, was opened to the public in August 2023. It comprises 18 stations, a depot and 43.3 km of track across two lines.

SMEC, as part of the Oriental Consultants team, performed the role of supervision consultant throughout the construction phase. The team's expertise helped to ensure that the project was completed to the highest standards incorporating cutting-edge technology and world-class engineering solutions.

The Indonesian capital Jakarta has a population of over 25 million. To alleviate some of the city's major issues such as chronic traffic congestion, increasing road accidents and air pollution, the Indonesian government decided to develop a comprehensive, mass public transport system that has the capacity to grow.

Construction of the Jabodebek LRT Phase 1 began in September 2015, undertaken by Indonesian contractor PT. Adhi Karya under a design and build contract. The line connects a main business district in central Jakarta with the cities of Depok and Bekasi in West Java province.

Set to carry up to 500,000 passengers per day, the new service deploys 31 trains, with a capacity to accommodate up to 1,300 passengers per trip. When fully completed, the entire line will connect central Jakarta with the cities of Bogor, Depok and Bekasi (Jabodebek).

In April 2017, Adhi Karya appointed Oriental Consultants Global in association with SMEC and four other consultants as the supervision consultant to oversee quality and progress of the works..

Several main features

The Jabodebek LRT was a complex and challenging project, explained SMEC. One of its notable features is the U-shape girder system used to construct the viaducts. The slim shape has proved to be an elegant and cost-effective solution, saving space in the dense urban surroundings. Prefabrication made it easier to build the viaducts. Their shape also helps to distribute the force of an earthquake more evenly.

Furthermore, the use of a detailed 3D model optimised the alignment of the LRT system and enabled the team to identify potential hazards, enhancing communication with the client and key stakeholders.

TOP, ABOVE, BELOW AND OPPOSITE:
Phase 1 of the Jabodebek LRT system was inaugurated in August 2023. It comprises 18 stations, a depot and 43.3 km of track across two lines. SMEC, as part of the Oriental Consultants team, performed the role of supervision consultant throughout the construction phase.

SMEC added that lead rubber bearings were also used to isolate the track structure from earthquakes, which helps to protect the LRT system from seismic activity; while fibre optic cables are being used for the telecommunications system, which provides a more reliable and secure communication system.

SMEC's engineering solutions

Oriental Consultants appointed four international experts from SMEC to perform the following roles:

- Chief railway system and integration expert: responsible for the overall integration of all systems for the Jabodebek LRT project into a cohesive system. This included the electrical systems, the mechanical systems, the signalling systems and the operating systems.
- General electrical expert: responsible for the design review, procurement, installation and commissioning of all electrical systems

for the Jabodebek LRT project. This included the power supply system, the traction system, the lighting system and the signalling system.

• General mechanical expert: responsible for the design review, installation and site supervision, as well as testing and commissioning of all mechanical systems for the Jabodebek LRT project. This included VAC systems, sanitary and drainage, rainwater system, water supply, elevators and escalators, fire protection, fire suppression system for stations, sub-stations and depot.

• Telecommunication expert: responsible for the design, procurement, installation and commissioning of all telecommunication systems for the Jabodebek LRT project. This included the communication system (SCADA), the CCTV system and the public address system.

A key consideration for the SMEC team was to oversee the implementation of a reliable automation and communication system. This system, known as Grade of Automation Level 3, transmits information between the train control system, the signalling system and the safety systems. The automatic train control system will control the speed and movement of the driverless trains, which will help to improve safety and efficiency.

Karen Atkinson, SMEC chief operating officer for Southeast Asia, said, "Jabodebek LRT is an immensely complex rail project constructed through some of the most congested areas of Jakarta. SMEC and our partners, together with building contractor Adhi Karya, are immensely proud of the outcome. Together we have delivered an integrated suite of rail systems, engineered to increase service capacity, guard safety, enhance customer experience and streamline operations."

"The Jabodebek LRT is a testament to the power of partnership and collaboration. The Indonesian government worked together with global experts Oriental Consultants and SMEC, as well as other partners, to create a project that is both safe and efficient. Our collaborative culture helped us to identify and mitigate risks, ensuring that the project will be a success for years to come," said Habibie Razak, SMEC regional manager for Indonesia. ■

Website: www.smec.com

ABOVE AND BELOW: **One of the notable features of the project is the U-shape girder system used to construct the viaducts. The slim shape has proved to be an elegant and cost-effective solution, saving space in the dense urban surroundings.**

ABOVE AND LEFT: **A key consideration for the SMEC team was to oversee the implementation of a reliable automation and communication system. This system, known as Grade of Automation Level 3, transmits information between the train control system, the signalling system and the safety systems.**

All images: SMEC

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Image: Doka

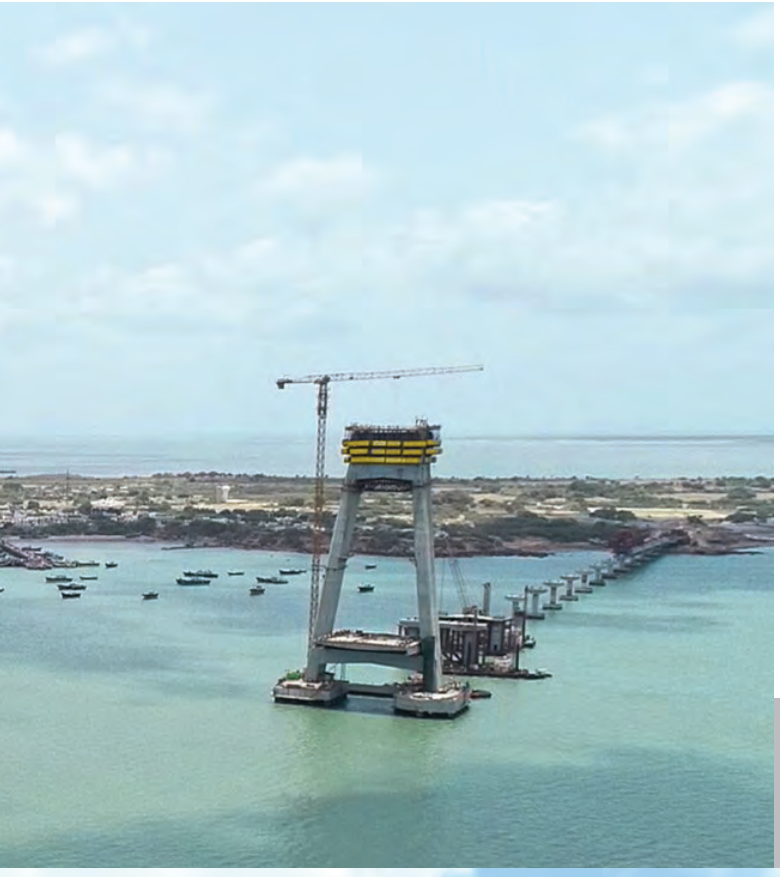
BRIDGING THE GAP

Featuring a length of 2.5 km, the 29.6-m-wide, four-lane Dwarka Bridge in India includes 3.5 km of retaining walls and a 1.42-km approach on either side. The total length between the two pylons stretches 500 m, which is said to be the largest span of any cable-stayed bridge in the country. The overall structure is suspended by 76 cables.

Customised formwork solution

Doka has recently completed work on this new bridge, which provides connectivity within the northwestern region of Gujarat. The company's formwork and engineering solutions were used on the 900-m-long, central cable-stayed bridge section, including highway approaches.

The most challenging aspect of the project was the design of the pylons which are curved along a vertical structure, at an angle of 20.1 degrees at the centre, 22.6 degrees to the left and 19 degrees to the right, explained Doka. As such, the formwork solution required a significantly tailored approach, while adhering



to the strict engineering requirements of the completed structure.

Doka India was awarded the contract to provide a formwork solution for the two A-shaped composite pylons, each reaching a height of 130 m and located in the open water of the Gulf of Kutch. This complex solution was designed by Yogesh Patil, Doka India's group leader engineering and Pramendra Singh, Doka India's project engineer.

The Doka formwork instructor team, Ash Narayan Singh and Bijaya Kumar Swain, were not only able to find a solution that met the project's requirement but also enabled the onsite training for other stakeholders to learn and adapt in a safe manner. Mr Singh commented, "While several of our core products were used in the construction process, our key asset, particularly when it came to the pylons was our automatic climbing formwork SKE plus.

"Designed to be completely crane-independent, and fully modular, we were able to work around the unique and complex shape of the pylon, while remaining protected both from the weather and height. As a fully hydraulic system, it also meant that a lot of time could be saved during repositioning."

LEFT: **India's new Dwarka Bridge provides connectivity within the northwestern region of Gujarat.**

BELOW: **Doka and the project's contractor, SP Singla Constructions, inspect the two pylons from the water to review progress.**

Image: Doka

As part of the project's product solution, Doka's SKE50, SKE100, SKE100 plus, Top 50 and shaft platform were used throughout in order to support the timely execution. The Dwarka Bridge is expected to be completed this year.

Speaking on behalf of the contractor, SP Singla Constructions, project manager Devinder Singh said, "We've been particularly impressed with the work carried out by the Doka team, who has done a wonderful job by designing and guiding the formwork installation for our curved pylon, while simultaneously providing the technical support that has helped to reduce the overall time of each cycle. Thanks to this efficiency, and the diligent training provided to our engineers, foremen and team on site, we've managed a smooth and safe operation throughout." ■

Website: www.doka.com

Each of the two A-shaped pylons reaches a height of 130 m.

Image: Doka

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'WE SHOW 71'

Sennebogen celebrates 71 years

Established in 1952, Sennebogen celebrates turning 71 this year with a special event held at its headquarters in Germany on 19-22 September, attended by more than 2,500 guests from around the world. Themed 'We Show 71', it featured an in-house exhibition showcasing the company's latest technological developments and various key investments globally.

Global presence

Sennebogen currently has 2,200 employees at five locations in Bavaria, Germany; two steel plants in Hungary; and branches in the US and Singapore. The sales and support for the company's material handlers, cranes and telehandlers from Straubing and Wackersdorf (in Germany) are carried out by a comprehensive network of dealers, with over 180 sales and service partners at over 300 service centres worldwide.

In the past few years, Sennebogen has not only recorded an average sales growth of 16% to now more than €600 million in annual sales, but has also seen continuous investments in existing and new locations. At the same time, the company's workforce grew dynamically to its current size.

However, despite this significant growth, one thing has stayed the same: Sennebogen is and remains a family business – now managed by the second generation Erich and Walter Sennebogen as well as the third generation Anton and Sebastian Sennebogen. The two other grandchildren of the company founder are already in the starting blocks and are involved in all the important appointments and events.

"Our customers are amazed by the dynamic approach and agility of the company, and we are sure that the investments will have a very positive impact on further development," said Erich.

"The business areas have become more diverse and customer demand for quality products and services is growing constantly. To stay ahead of the competition, we invest in our product portfolio and locations every year."

Sennebogen's new product development campus at the Straubing/Port site brings new machine development, testing and prototype construction together in a central location to create synergies and enable a more intensive focus on the development of new technologies.

The company's site in Wackersdorf was recently expanded to incorporate a larger shipping area and a test centre for electric machines.

Major investments

One of Sennebogen's largest projects in recent years was its customer service centre in Steinach, Germany, which opened in September 2021 and bundles all activities from the areas of spare parts, customer service, as well as rental and used machine fleet of Sennebogen Vertriebs GmbH & Co KG. Covering an area of 87,000 sq m, there are now two office buildings, spacious halls and a modern spare parts warehouse with automated warehouse technology and optimised logistics processes.

Expansions also took place at the Wackersdorf site, added Sennebogen. Besides the new shipping area, a new 1,000 sq m electrical test centre was built, which is used specifically for testing and finishing the electric machines.

Meanwhile, a second steel plant has been built in Litér, Hungary. A 29,000 sq m production hall and an office building occupy an area of over 13 ha. This new plant is designed for handling large and heavy components up to approximately 30 m in length and 25 t in weight, and offers a capacity for 20,000 t of steel structures per year in the current expansion stage.

ABOVE: **Covering an area of 87,000 sq m, the new customer service centre in Steinach bundles all activities from the after-sales area.**

LEFT: **Sennebogen is expanding its capacities for steel assemblies and welded structures with the new 13-ha steel structure site in Hungary.**

ABOVE AND BELOW: **A Sennebogen machine in action during the We Show 71 event.**

"With this investment in Hungary, we are not only expanding our capacities for steel structures to meet the growing demand, but also building reserves for the future," explained Walter.

In addition, the new product development campus at the Straubing/Port site consists of a new 1,200 sq m prototype centre, a 1,300 sq m research and test centre, and a 3,000 sq m design and technology centre. Here, new machine development, testing and prototype construction are brought together in a central place to enable a more intensive focus on the development of new technologies. This was accompanied by the establishment of a separate department for prototype construction. According to Sennebogen, the open concept of the new buildings creates synergies between the research halls and offices and enables an agile and innovative response to the increasingly complex requirements on technology.

"Modern control systems, electromobility, battery technology and innovative drive systems are topics that employees can focus on even more intensively in the future," said Erich. "This is because continuous expansion of our own development work in the company and an ever-increasing focus on new

drives, automation and digitalisation of machines require not only innovative power, but also space to optimise processes and fulfil the increased order volume."

Sustainable future

Moving forward, Sennebogen affirmed that the company is committed to its goal of becoming climate neutral by 2030. As such, the ecological mindset is a key focus in its construction projects.

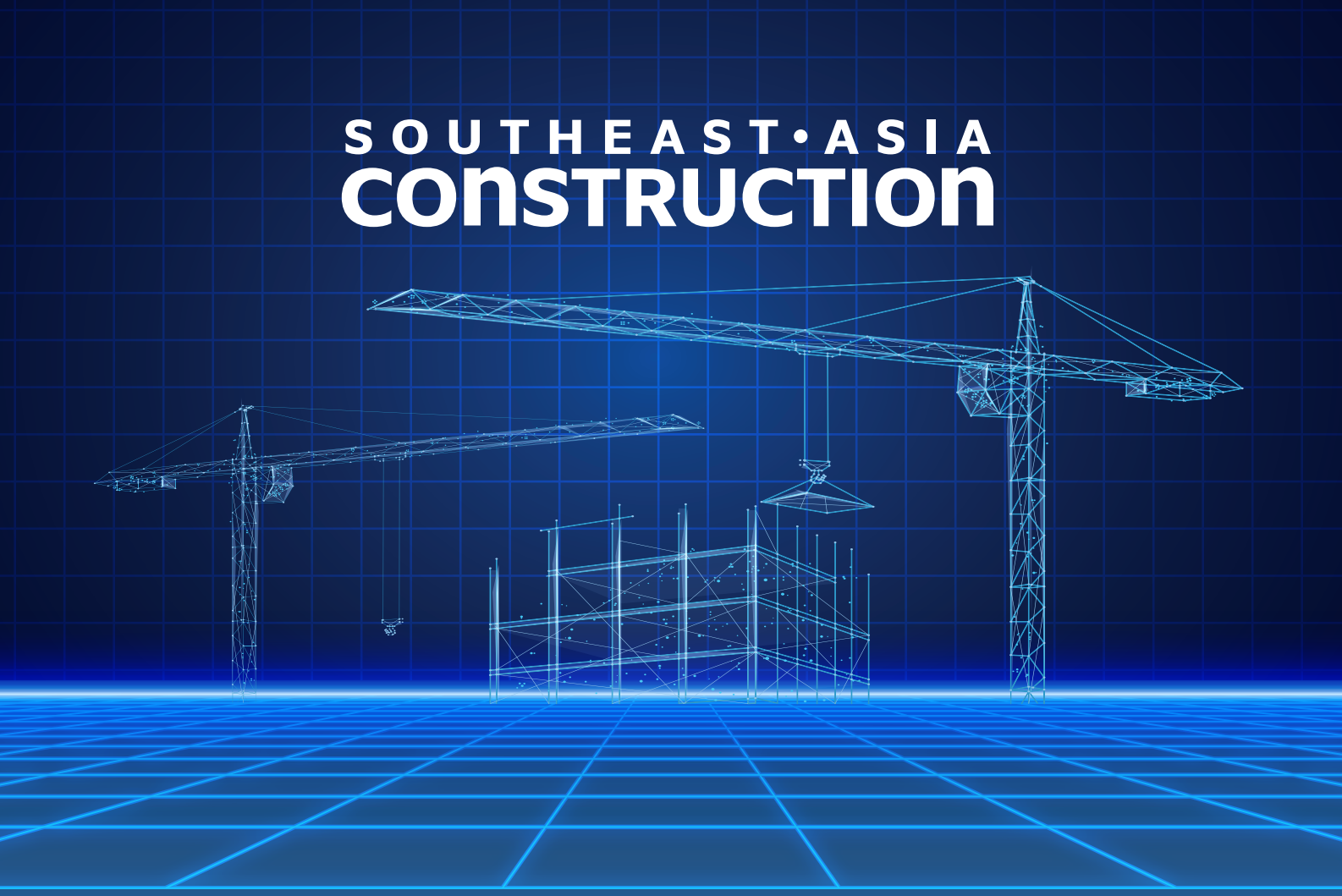
All new buildings are built in accordance with the KfW 55 standard (reduces energy consumption by 45%) and are therefore energy-efficient and environment-friendly. Energy-saving LED lighting, heating buildings with low-temperature heating via concrete core activation and environment-friendly cooling using groundwater play a role here, as does the extraction of renewable energies at the sites themselves. In recent years, investments have also been made in photovoltaic systems with more than 4 MW of output and woodchip heating systems with 4 MW.

Website: www.sennebogen.asia

TOP AND ABOVE: **The We Show 71 event was attended by more 2,500 guests from around the world, including dealers and customers from the Asia Pacific region.**

LEFT, BELOW AND BELOW LEFT: **Taking place from 19 to 22 September 2023 in Straubing, Germany, the event featured an in-house exhibition showcasing Sennebogen's latest technological developments and various key investments globally.**

SOUTHEAST·ASIA CONSTRUCTION



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CELEBRATING ENGINEERING EXCELLENCE

Three engineers recognised for outstanding achievements in Singapore projects

Building on top of MRT tunnels and close to a conserved bungalow, while safeguarding the integrity of these structures, were among the challenges faced by award winners of Singapore's Building and Construction Authority's (BCA) Design and Engineering Safety Award 2023.

The award recognises Professional Engineers (PEs) and their teams for applying innovative designs and engineering solutions in challenging projects. Three PEs were conferred with the award this year.

lyf one-north Singapore

Engineer (Er.) Teoh Eng Sin of Mott MacDonald Singapore Pte Ltd, a third time winner for this award, designed and supervised the safe construction of lyf one-north Singapore, a co-living residential development at One North Buona Vista. The building includes two seven-storey blocks of rooms with attached bathrooms as well as shared communal kitchen, loungers and entertainment areas.

Er. Teoh's challenges for this project were that part of the development's area sits on top of the MRT Circle Line tunnels, which limits the use of the site and its construction was subject to strict requirements in terms of tunnel movement. To add on to the challenges, the north of the site is bounded by a 5-m-high slope with a conserved bungalow at its top.

To minimise the tunnel movement, Er. Teoh devised a solution where a swimming pool is supported on a shallow foundation on top of the MRT tunnels. He also conducted a detailed analysis which confirmed that the impact from his design of the foundation met stringent requirements. Based on the readings of the tunnel monitoring system installed, the tunnel movement was limited to less than 0.1 cm.

More importantly, Er. Teoh proposed and successfully supervised the safe construction of a structure – comprising steel structures called transfer girders which are supported by six slanted columns – which becomes a link bridge connecting the two blocks. This not only simplified the construction for this part of the project, but also allowed for some rooms to be built along the link bridge without compromising the architect's original design intent of a five-storey-high viewing/ventilation corridor.

Kallang Polyclinic and Long-Term Care

Another winner was Er. Lim Keong Liam of Arup Singapore Pte Ltd, who designed the structure for Kallang Polyclinic and Long-Term Care (Kallang Polyclinic). The first five storeys of this building consist of the polyclinic, while the next five storeys house the long-term care facility. The challenges Er. Lim faced was that the site is located next to the Kwong Wai Shiu Hospital and in close proximity to HDB apartment blocks. Also, part of its site area sits on top of two MRT tunnels along the North East Line with a diverse geology across varying depths.

To overcome these challenges, Er. Lim employed a 'hybrid' construction of precast components for the first five storeys of the building – which house the polyclinic – and prefabricated prefinished volumetric construction (PPVC) modules which make up the next five storeys for the long-term care facility. This allowed both the polyclinic and long-term care facility to be constructed concurrently, as the components and modules were manufactured and finished in an off-site plant before being transported and assembled at the site.

The solution also greatly reduced the amount of noise and dust that could affect the patients at the Kwong Wai Shiu Hospital throughout its construction. Furthermore, Er. Lim carried out detailed analysis and implemented solutions that resulted in minimal movements of the MRT tunnels during the project's construction.

Whistler Grand

Er. Heng Kim Huat of TW-Asia Consultants Pte Ltd also won the award for Whistler Grand, a private condominium at West Coast Vale comprising two blocks of 36-storey apartments with two basement carparks and a three-storey-high sky terrace at each block. His challenge was the Government Land Sales requirement for this project to incorporate productive construction methods.

To solve the problem, Er. Heng devised a plan such that at least

All images: BCA

65% of the floor area for both blocks from the 2nd to the 36th storey were constructed using modules that were prefabricated and prefinished at a manufacturing plant. Each module would then be transported to the site, hoisted and assembled together, with a few modules combining to form a residential unit. With such construction method, all modules at Whistler Grand would have been installed and completed within a year if not for the Covid-19 pandemic.

Another engineering feature was the gymnasium, which extends 7.4 m in length over and above the swimming pool. Er. Heng designed a rigid horizontal structural floor element called a cantilever, which is supported only at one end of the structure. To control the deflection, Er. Heng designed the cantilever floor using closely spaced steel beams that are encased in concrete. For the comfort of gym users, he also conducted a floor vibration analysis.

BCA group director (building engineering), Er. Tan Chun Yong, said, "Professional Engineers have an important role to play in our built environment. They not only ensure the safety of our buildings, but also employ innovative engineering solutions to overcome challenges while improving the way we build.

"The Design and Engineering Safety Award recognises Singapore's top engineering professionals who have developed creative engineering methods for challenging architectural designs and overcoming site constraints so that their projects can be completed safely. We hope that they will inspire younger Singaporeans towards a fulfilling and rewarding career in our built environment, contributing to our country's development." ■

ABOVE LEFT: **Er. Teoh Eng Sin of Mott MacDonald Singapore won the award for lyf one-north Singapore.**

ABOVE: **Er. Lim Keong Liam of Arup Singapore won the award for Kallang Polyclinic and Long-Term Care**

LEFT: **Er. Heng Kim Huat of TW-Asia Consultants won the award for Whistler Grand.**

> ***Professional Engineers have an important role to play in our built environment. They not only ensure the safety of our buildings, but also employ innovative engineering solutions to overcome challenges while improving the way we build.***

LYF ONE-NORTH SINGAPORE

Commercial Category

Image: BCA

Qualified Person:
Er. Teoh Eng Sin

C&S Consultant:
Mott MacDonald Singapore Pte Ltd

Builder:
Nakano Singapore (Pte) Ltd

Developer:
DBS Trustee Limited (as trustee of CapitaLand Ascott Real Estate Investment Trust)

Architectural Consultant:
Woha Architects Pte Ltd

CHALLENGES

• Engineering a three-storey link bridge building, to connect two L-shape, seven-storey buildings, from the 5th to 7th storey.

• Tight and narrow sloping site, with a height difference of 5 m, from front (Portsdown Road) to back (Nepal Hill), along with a section of the site being only 20 m above the two Circle Line (CCL) MRT tunnels.

• Site restrictions included a five-storey unobstructed viewing and ventilation corridor (Government Land Sales requirements) to the conserved bungalows, within proximity to edge of slope.

SOLUTIONS AND FEATURES

• The elevated swimming pool is supported on a shallow foundation directly above the CCL MRT tunnels. This was needed to free up the site, outside the 1st reserve for the whole building pile foundations. The team used 3D finite element analysis to ensure minimum impact to the CCL tunnels and verified this through automatic tunnel monitoring system.

• Collaborative team design development. This led to the creation of the three steel plate girders and slanted steel column support structure. This design achieved minimum obstruction to the viewing and ventilation corridor and a safer build programme.

• The transfer plate girders and slant columns being critical elements, were designed with redundancy to code compliance for a safe and robust design, protected with fireproof paint and exposed as part of building features.

• Adopting soil nail temporary stabilised slope with glass fibre reinforced polymer (GFRP) bar as earth retaining stabilising structure (ERSS) for excavation, as well as detail instrumentation where monitoring confirmed minimal ground movement and the bungalow structure at higher ground was unaffected by the excavation.

• The team designed the gravity detention drain system at high ground, removing the need for underground tank and pumps, which leads to capital cost and energy saving. ■

KALLANG POLYCLINIC AND LONG-TERM CARE

Institutional and Industrial Category

Image: BCA

Qualified Person:
Er. Lim Keong Liam

C&S Consultant:
Arup Singapore Pte Ltd

Builder:
Tiong Seng Contractors (Pte) Ltd

Developer:
Ministry of Health

Architectural Consultant:
RDC Architects Pte Ltd

CHALLENGES

• Design and construct a barrier-free public healthcare and long-term care facility with seamless and sheltered connectivity to main public transport node, located within a congested and land-locked site flanked by a conservation building.

• The development was to cater specially for a prominent visual landmark at main entrance, which is a shared entryway with adjacent building, while ensuring sufficient green space and outdoor seating amidst space constraints with ¼ of 4,000 sq m site situated over 1st Railway Reserve Line (RRL) zone that is partially bisected by twin bored tunnels.

• The superstructure was expected to be erected within a challenging and tight 26-month construction timeline.

SOLUTIONS AND FEATURES

• Geotechnical investigations and analyses were carried out to provide a robust notional excavation scheme that would not impact the tunnel structures. The overall building form was also extensively studied and set back from the first reserve to bypass this constraint.

• Design for manufacturing and assembly (DfMA) techniques, including precast, PPVC and structural steel elements, were integrated into the superstructure to align with the accelerated construction programme. The team had reduced the modules to five types, optimising repetition of modules for production. Five storeys of the superstructure comprising 131 modules were installed within just four weeks.

• Employed steel prefabricated prefinished volumetric construction (PPVC) due to its lightweight nature, reducing crane usage and streamlining module connections. Factory-made PPVC modules, featuring welded intra-module connections, were bolted together on-site. This modular strategy facilitated simultaneous construction of long-term care modules and the polyclinic, thus accelerating construction productivity and workmanship, reducing man-hours on-site, and minimising disruptions to Kwong Wai Shiu Hospital and surrounding HDBs through better noise and dust control. ■

WHISTLER GRAND

Residential Category

Image: BCA

Qualified Person:
Er. Heng Kim Huat

C&S Consultant:
TW-Asia Consultants Pte Ltd

Builder:
Woh Hup (Private) Limited

Developer:
CDL Pegasus Pte Ltd

Architectural Consultant:
ADDP Architects LLP

CHALLENGES

- To understand the concept & constraints and design of suitable prefabricated prefinished volumetric construction (PPVC) system.
- Quality assurance and quality control (QAQC) and coordination of PPVC modular works.
- Handling of large and heavy PPVC modules.
- Presence of non-typical sky terrace platform at typical PPVC floor.

SOLUTIONS AND FEATURES

- Early engagement with the builder and project team to achieve a common mindset and necessary technical capabilities, which was crucial for the adopted PPVC system to be successful and cost effective. Design for standardisation of units, which helped to ensure the effectiveness of the PPVC system while using an innovative 'composite shear wall system (patented)'. This also helped to maximise a user-friendly room area and usage.
- Working with the builder to ensure accurate fabrication of carcass of the PPVC modules (dimensional controls using 3D steel mould casting) and accurate site installation (survey controls for levelling and verticality). Coordinating closely with the builder to ensure the whole PPVC construction cycle was smooth and seamless.
- Early planning and study on the heavy-duty crane hoisting capacity and transportation routing to comply with the Land Transport Authority's (LTA) requirements to avoid any costly police escort. Facilitating the builder to adopt a large 'integrated precast slab-beam element' for construction of a non-typical sky terrace extension platform over the void to eliminate the use of a conventional formwork system. ■

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