SOUTHEAST·ASIA CONSTRUCTION

MARCH - APRIL 2023

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Tseung Kwan O – Lam Tin Tunnel, Hong Kong

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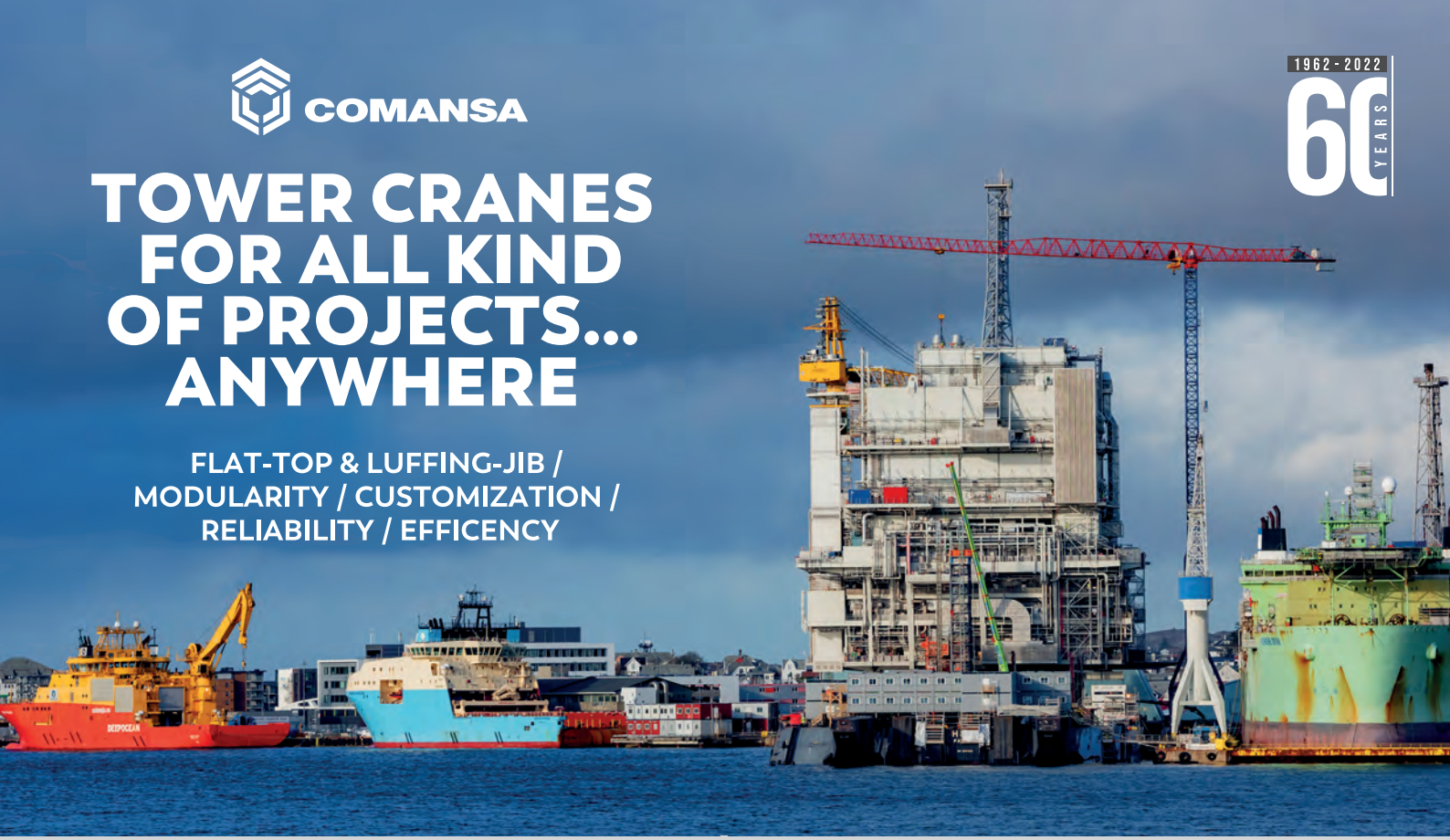

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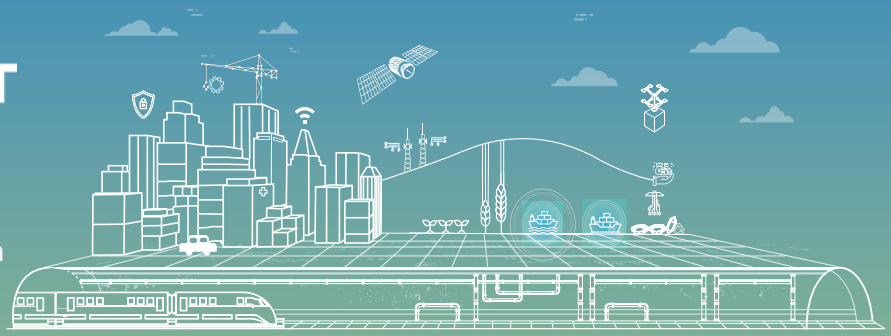

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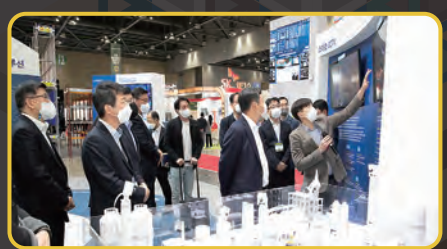

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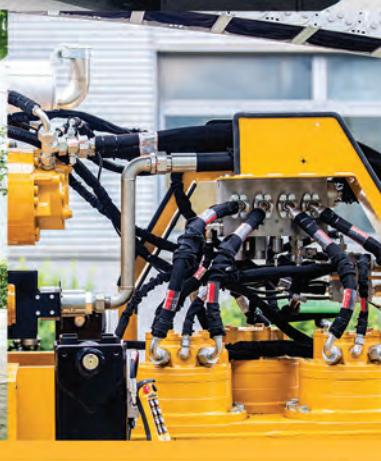

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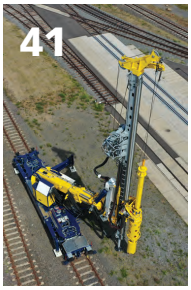

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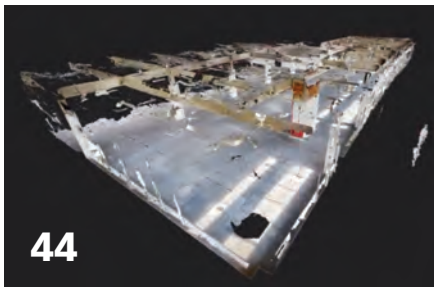

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Singapore's construction demand to reach S$27-$32 bil

The Building and Construction Authority (BCA) projects the total construction demand in Singapore (i.e. the value of construction contracts to be awarded) to range between S$27 and S$32 billion in 2023.

The public sector is expected to contribute about 60% of the total construction demand, between S$16 and S$19 billion. This is supported by a continued strong pipeline of public housing projects amid Housing Development Board's (HDB) ramping up of build-to-order (BTO) flats supply. Industrial and institutional building construction is expected to contribute strongly to public sector demand, with more projects for the construction of water treatment plants, educational buildings and community clubs. Civil engineering construction demand is anticipated to stay firm with continued support from MRT line construction and other infrastructure works.

Private sector construction demand is projected to be between S$11 and S$13 billion in 2023, comparable with 2022 figures. Both residential and industrial building construction demand are expected to be similar to last year's level, underpinned by the development of new condominiums and high-specification industrial buildings. Due to the rescheduling of some major projects from 2022 to 2023 as well as the redevelopment of old commercial premises to enhance asset values, commercial building demand is anticipated to increase.

The preliminary total construction demand for 2022 reached S$29.8 billion, within BCA's earlier forecast of S$27-$32 billion and similar to the S$29.9 billion recorded in 2021. The continued firm demand was largely supported by residential and infrastructure projects in both public and private sectors.

Public sector construction demand improved slightly from S$17.8 billion in 2021 to S$17.9 billion in 2022, underpinned by major projects such as the Cross Island MRT Line (Phase 1), Jurong Region MRT Line, the Ministry of Health's (MOH) healthcare facilities and new BTO units.

On the other hand, while the private sector construction demand moderated slightly from S$12.1 billion in 2021 to S$11.9 billion in 2022 amid various economic downside risks, demands for private residential and industrial building developments remained resilient.

The total nominal construction output (value of certified progress payments) is projected to increase to between S$30 and S$33 billion in 2023, from the preliminary estimate of about S$30.2 billion for 2022. This is due to a steady level of construction demand and some backlog of remaining workloads impacted by the Covid-19 outbreak since 2020.

"Even though construction demand appears to be steady, we must remain vigilant," said Desmond Lee, Singapore's Minister for National Development and Minister-in-charge of Social Services Integration.

Speaking at the BCA-REDAS Built Environment and Property Prospects Seminar 2023, Mr Lee highlighted the challenges ahead, which include "the growing risk of recession in major economies around the world, supply chain pressures as countries continue to adjust their Covid-19 management policies, and the existential threat of climate change."

"It is important that we take in what we have learnt over the past few years during the pandemic to enhance our BE [built environment] sector's resilience," he reminded. "This includes reducing our reliance on foreign manpower for labour-intensive tasks, and doing more to fulfil our net-zero climate goals."

© BCA-REDAS

Desmond Lee, Minister for National Development and Minister-in-charge of Social Services Integration, speaking at the BCA-REDAS Built Environment and Property Prospects Seminar 2023.

Forecast for 2024-2027

Over the medium-term, BCA expects the total construction demand to reach between S$25 and S$32 billion per year from 2024 to 2027.

The public sector will continue to lead demand and is expected to contribute S$14-$18 billion per annum from 2024 to 2027, with about 60% of demand made up by building projects and the rest by civil engineering works.

Besides public housing developments, public sector construction demand over the medium-term will be supported by various major developments, such as MRT projects including the Cross Island Line (Phases 2 & 3), Downtown Line Extension to Sungei Kadut and Brickland North South Line station, as well as Toa Payoh Integrated Development and Woodlands Checkpoint redevelopment.

Private sector construction demand is projected to remain steady over the medium-term, reaching approximately S$11-$14 billion per annum from 2024 to 2027, in view of healthy investment commitments amid Singapore's strong economic fundamentals.

Stepping up transformation efforts

With strong construction demand projected for the year, many firms are also stepping up their transformation efforts. Four developers — CapitaLand Development, City Developments Limited, GuocoLand and UOL Group Limited — have signed Memorandums of Understanding (MOUs) with their respective value chain partners (builders, consultants and sub-contractors) to support one another in an attempt to improve productivity, reduce foreign labour and build resilience against unprecedented crises.

These firms will be jointly applying for BCA's Growth and Transformation Scheme (GTS), which was announced in March 2021, and other relevant grants. To receive support in the transformation journey, the firms are required to demonstrate that their proposed business plans and initiatives will meet outcomes under five categories: strategic collaboration/business growth, human capital development, productivity, digitalisation, and sustainability. ■

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Shimizu-led JV begins tunnelling work on Metro Manila Subway Project

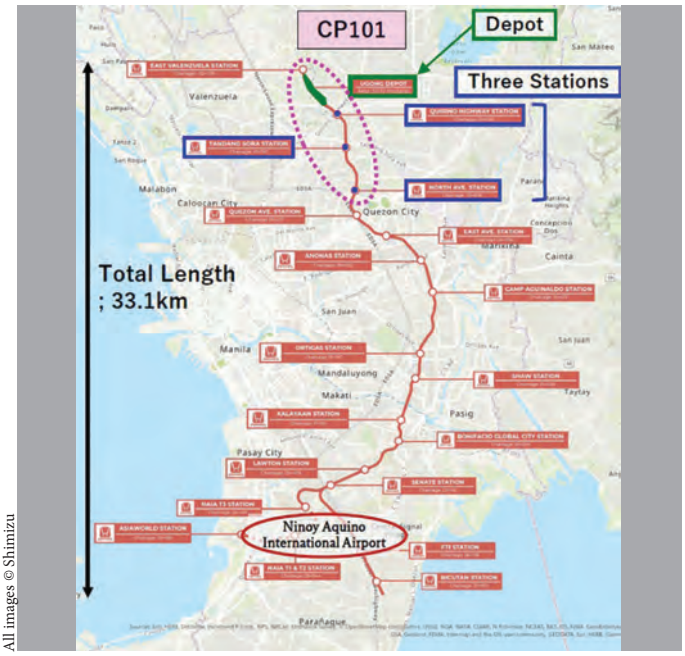
A joint venture (JV) led by Shimizu Corporation has commenced the excavation of tunnels using the shield tunnelling method on the Philippines' Metro Manila Subway Project (MMSP) CP101.

The tunnel boring machine (TBM) launching ceremony was held on 9 January 2023, attended by Philippine President Ferdinand Marcos Jr and Jaime Bautista, Secretary of Department of Transportation. Shimizu's JV partners include Fujita Corporation, Takenaka Civil Engineering & Construction Co Ltd, and EEI Corporation (a major local construction company).

The MMSP, dubbed the first subway system in the Philippines, aims to alleviate the traffic congestion in Metro Manila due to a rapid population growth in the area. A total of 17 stations and a depot will be constructed along the 33.1-km section connecting Mindanao Avenue in the northern part of Metro Manila to Western Bicutan in the southern part of Metro Manila, where the Ninoy Aquino International Airport is located.

Shimizu said the JV will build the first 7.3-km section of the project – known as CP101 – from the depot to the north Metro Manila. This includes the depot, three stations and six shield tunnels that connect the stations (three northbound and three southbound). The CP101 project is scheduled to be completed in July 2027.

The design and construction works under the CP101 contract have been divided into three segments, shared Shimizu. First, the construction of the depot, Tandang Sora station and cut-and-cover tunnel, which was carried out in November 2019. Second, the structure work for the Quirino Highway station and North Avenue station, which was carried out in March 2020. Lastly, the tunnel construction and the architectural and MEP works for the Quirino Highway station and North Avenue station, which was carried out in December 2021.



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The Metro Manila Subway Project route plan.

The JV will excavate the tunnels using the shield tunnelling method.

President Ferdinand Marcos Jr (centre) presses the button to launch the TBM.

The tunnelling work that has just begun involves the construction of six underground tunnels with a total length of 9.5 km and an inner diameter of 6.1 m, using up to six earth pressure balance (EPB) TBMs. The first two TBMs launched on 9 January were headed from the launching shaft at the depot to the Quirino Highway station. The northbound and southbound tunnels between North Avenue/Tandang Sora stations and Tandang Sora/Quirino Highway stations will be constructed in turn. Moreover, four TBMs will launch and arrive sequentially.

Shimizu highlighted that, being the first subway construction project in the Philippines, the MMSP has gained much attention from the residents of Metro Manila and is highly anticipated to play a key role in relieving traffic congestion. The project has now reached a major milestone with the launching of the first boring machine, and is expected to reach its peak construction period in the coming years. ■

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Liebherr's first battery-powered crawler crane in Asia

A handover ceremony to celebrate Gammon Construction taking possession of Hong Kong's first battery-powered crawler crane was held on 11 January 2023. The introduction of the LR 1160.1 unplugged to its plant fleet marks a milestone on Gammon's journey to achieving its company-wide emission reduction targets, which are in line with climate science and the Science Based Target initiative (SBTi).

Delivered from Austria and with a maximum lifting capacity of 160 t, the new crawler crane will be deployed on Gammon's Terminal 2 expansion project at the Hong Kong International Airport (HKIA).

The crane with an alternative drive system enables a healthier working environment for everyone working on site, and a net carbon saving of nearly 76 t CO2e every year. It can also be used in both plugged and unplugged modes, which provides flexibility in its site deployment. In addition, the battery has a short charging time of only 4.5 hours.

The LR 1160.1 unplugged acquired by Gammon is also the first Liebherr battery-powered crawler crane in the Asian market. "With our unplugged cranes we offer our customers an alternative drive design. As we have already seen with the LB 16 unplugged, the first battery-powered drilling rig, the strategy is a complete success," said Andreas Ganahl, managing director for sales at Liebherr (HKG) Ltd.

"Strict requirements regarding environmental sustainability in tenders for construction projects increase the demand for advanced technologies. For us, it was clear that we extend and successfully establish the design in further product groups."

Kevin O'Brien, chief executive of Gammon, said the company "believes business sustainability and environmental sustainability are inherently interlinked. The introduction of the first electric crawler crane to Hong Kong demonstrates Gammon's commitment towards net zero. We look forward to having quieter, cleaner and lower carbon construction sites in the future."

Under the SBTi commitment, Gammon is setting two targets for 2033. First, the company will cut 55% of its absolute energy-related emissions through early site electrification, the deployment of electric plant and vehicles, increased energy efficiency and the adoption of modern methods of construction.

The handover ceremony of Liebherr's first battery-powered crawler crane in the Asian market with customer Gammon. The LR 1160.1 unplugged will be used on the Terminal 2 expansion project at HKIA.

The second target is that Gammon will reduce its indirect emissions – mainly the embodied carbon in materials – by 33% through modularisation and reuse of structural steel, lower carbon concrete mixes, procurement of lower carbon steel, optimised material usage through design and construction methods, and selection of alternative materials with a lower carbon footprint.

Last year, Gammon also introduced CarbonCure technology to Hong Kong, whereby carbon dioxide is injected into concrete to help reduce its carbon footprint. The company is pleased to be an industry frontrunner in the adoption of green construction technology. ■

Singapore's Tiong Woon Crane wins contract from Takenaka

Tiong Woon Corporation Holding Ltd has announced that its wholly owned subsidiary, Tiong Woon Crane Ptd Ltd, has been awarded a contract by Takenaka Corporation for the proposed erection of a new manufacturing facility, including integration works with additions and alterations to existing blocks at Pasir Ris Industrial Drive 1, Singapore.

The scope of work includes the supply of cranes, provision of heavy lifting services, as well as provision of engineering expertise and project management services throughout the project.

According to Tiong Woon, the project will start in the second half of the financial year ending 30 June 2023, and is expected to be completed by October 2023.

Ang Guan Hwa, Tiong Woon's executive director and CEO, said, "We are delighted to have been awarded this contract for the construction of the new manufacturing facility – it is a testament to our team's commitment to providing high quality engineering and construction services. We look forward to working with all stakeholders involved to ensure that this transformation project is completed on time and within budget."

Headquartered in Singapore, Tiong Woon is a leading one-stop integrated heavy lift specialist and service provider, supporting mainly the oil and gas, petrochemical, infrastructure and construction sectors, with proven track record of more than 40 years. The group also has a strong regional presence with establishments in 12 other countries.

Tiong Woon manages turnkey projects for engineering, procurement and construction (EPC) contractors and project owners, from planning and designing heavy lifting and haulage requirements to the execution stage. ■

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Serving as a one-stop dealer for all customer needs, Manitou Center Singapore offers sales of new or used machines, equipment rentals, after-sales service and spare parts.

"This is a very special day for Manitou Center Singapore. It is more than just the inauguration of a new office, it is a commitment for us to provide a one-stop solution to our customers and to introduce efficient and greener machines to our customers in Singapore," said Mike Chen, general manager of Manitou Center Singapore.

"We have been in Singapore for more than 30 years and are committed to further invest in Singapore and expand our operation here," added Bernd Freudenmann, vice president of Manitou Asia Pacific. "The Manitou Center Singapore is a very strategic element in our expansion strategy in Asia."

During the inauguration event, which was held in early February, a total of 10 different ranges of machines were displayed – signifying that Manitou Center Singapore is creating a strong foothold in the market by offering a diverse range of machines to satisfy different customer needs, from telehandlers to spider lifts and even mini excavators.

Gianpiero Marti, sales and marketing director of Ruthmann Bluelift, who also attended the event, said, "We are very much looking forward to a fruitful cooperation with Manitou Asia and are happy to have them as our partner in the global Ruthmann Bluelift distributor network.

"For our customers in Singapore and Malaysia, it means they will receive excellent customer service and professional technical support. We remain confident that through our cooperation, Ruthmann Bluelift's position in Asian markets will become stronger and enhance our customer experience and satisfaction."

The Ruthmann Bluelift SA 26 spider lift is targeted at operators requiring to work in compact indoor and outdoor spaces, as well as on slopes and uneven ground. According to Manitou Center Singapore, the machine weighs 3,350 kg and is 500% lighter than a typical same height boom lift.

The inauguration event took place in early February.

Guests at the event had the opportunity to view a diverse range of machines offered by Manitou Center Singapore.

In addition, the SA 26 spider lift features a working height of 26 m, 340° rotation, up to 28% gradeability and up to 250 kg basket load. The machine is manufactured with both electrical and diesel usage, and has an adjustable track width and auto levelling function.

"With a strong workshop and experienced field service team, we are able to travel to any site with our service vans equipped with tools and common spare parts needed to perform rapid service directly on-site," said Manitou Center Singapore.

The company added that it can also tailor service agreements to fit various customer concerns, and provide complete process offering from periodic maintenance to spare parts coverage and field servicing.

The key products in Manitou Center Singapore's rental fleet now include telehandlers, access platforms, rough terrain and industrial forklifts. ■

TOP AND ABOVE: **Manitou Center Singapore now offers the Ruthmann Bluelift SA 26 spider lift. The machine has a working height of 26 m, with a basket load of up to 250 kg.**

Serving as a one-stop dealer, Manitou Center Singapore provides sales of new or used machines, equipment rentals, after-sales service and spare parts.

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NLEX to implement major projects and more road upgrades in Philippines

The Philippines' NLEX Corporation has announced that it will continue to implement infrastructure developments and enhancement projects this year, which will further contribute to the country's economic growth.

"We will invest in major expansion and enhancement projects that are vital to the country's economic resurgence and, at the same time, ease the travel of the motoring public as we seek to support the government's call for the private sector to take part in nation-building," said J. Luigi L. Bautista, president of NLEX Corporation.

According to NLEX, these major projects – which aim to improve mobility, safety and connectivity for the motorists – include the NLEX Connector and Candaba Third Viaduct.

The entire NLEX Connector spans 8 km, starting from Caloocan Interchange on C3 Road up to the vicinity of the Polytechnic University of the Philippines (PUP) in Sta. Mesa, Manila. It is expected to decongest major thoroughfares in the metro. Its first section between Caloocan and España interchanges is scheduled to open within the first quarter of this year, said NLEX. The second section, connecting España and Sta. Mesa, is currently 29% complete (as of early January 2023).

Part of the construction of the second segment is the redevelopment of the Magsaysay Boulevard that features on and off ramps in Magsaysay and Sta. Mesa, improving portions of the local road network such as Osmeña Highway, Nagtahan, Rizal Avenue Extension, G. Araneta Avenue, and A. Bonifacio Avenue. It will also enable easier travel to various areas like Manila City Hall, Quiapo Church, University Belt, Intramuros, Rizal Park, Gilmore, Cubao, and San Juan.

Meanwhile, the construction of Candaba Third Viaduct is set to commence in the first quarter of 2023. The project will expand the 5-km bridge from existing three lanes without shoulder to three lanes with inner and outer shoulder per direction. In addition to making travels safer and more convenient, this new bridge will enable faster journeys as it will increase the maximum speed at the viaduct from 60 to 80 kph.

The entire NLEX Connector spans 8 km.

© NLEX Corporation

Also in the pipeline is the construction of new expressway lanes in Pampanga from San Fernando to SCTEX Spur in Mabalacat.

Apart from building new roads, NLEX is looking to improve its assets for better customer experience by undertaking the regular pavement repair and bridge strengthening programmes, replacement of traffic safety devices, and continuous improvement of its toll systems.

To reduce its carbon footprint, NLEX will start using electric vehicles in its operations. The company also plans to continue its resource-saving initiatives of harnessing solar power in select toll plazas.

NLEX Corporation is a subsidiary of the Metro Pacific Tollways Corporation (MPTC), the toll road arm of the Metro Pacific Investments Corporation (MPIC). ■

Leighton Asia secures highway expansion project in Philippines

CIMIC Group company Leighton Asia has been selected by the NLEX Corporation to design and construct the third bridge of the Candaba Viaduct in the north of Manila, Philippines.

The scope includes the design and construction of an independent 5.3-km bridge between the two existing lanes of the Candaba Viaduct. According to Leighton Asia, the contract will generate revenue of approximately A$161 million for the company.

"The Candaba Viaduct is a strategic link in one of the major road networks in the Philippines. Construction of the third bridge will expand the capacity of the existing network and improve safety for motorists," said Juan Santamaria, executive chairman of CIMIC Group.

"We are pleased to be selected to deliver another world-class asset for the Philippines and further support economic development in the country's north."

Brad Davey, managing director of Leighton Asia, added, "The award of this contract is a testament to the trust and reputation Leighton Asia has earned from the NLEX Corporation, with whom we have worked for 25 years.

"We are pleased to build on our long-term partnership by providing safe and sustainable solutions on the back of our international expertise and local knowledge."

Leighton Asia's experience on major highway projects in the Philippines includes the development of several sections of the North Luzon Expressway and the Cavite section of the Cavite Laguna Expressway. ■

LEFT: **Leighton Asia will design and construct an independent 5.3-km bridge between the two existing lanes of the Candaba Viaduct.**

‘Indian construction industry output to get boost from increased capital expenditure in budget’

The Indian construction industry is expected to receive a significant boost in 2023, supported by a sharp increase in capital expenditure as part of the financial year (FY) 2023/2024 (April 2023 to March 2024) budget, according to data and analytics company GlobalData.

In its latest budget, the government increased its total expenditure by 7.5%, from an estimated expenditure of INR41.9 trillion (US$522.2 billion) in FY2022/2023 to INR45 trillion (US$561.6 billion) in FY2023/2024. The capital investment outlay for FY2023/2024 is equivalent to 3.3% of the country’s GDP and is nearly three times the outlay made in FY2019/2020.

Pooja Dayanand, analyst at GlobalData, said, “The sharp increase in capital investment is in line with the government’s focus on boosting economic growth and increasing job creation, through investment in infrastructure development. The increase in funding will also be necessary for assisting ministries in implementing projects that have been delayed by constraints such as rising interest rates and construction material prices, and labour shortages.”

GlobalData explained that the budget is based on seven key priorities, including inclusive development, reaching the last mile, infrastructure and investment, and green growth. As part of the latest budget, the government increased its allocation to the state-owned National Highways Authority of India (NHAI) by 14% to INR1.6 trillion (US$20.2 billion). It had also announced a record-high capital outlay of INR2.4 trillion (US$29.9 billion) for the Ministry of Railways.

Ms Dayanand added, “The NHAI had been facing constraints in reaching its construction targets and is likely to miss its target for the second time in a row – in FY2022/2023. The increase in its budget allocation could help the NHAI in meeting its targets in the upcoming financial year, while completing its backlog targets. The significant capital expenditure allocations for highways and railways will also help in improving connectivity, easing traffic congestion and reducing travel times.”

In addition, the government has increased its allocation to the PM Awas Yojana (PMAY) by 66% to INR790 billion (US$9.9 billion) in FY2023/2024.

Ms Dayanand continued, “The increase in allocation for the PMAY will help in increasing the supply of affordable housing and addressing the issue of housing shortages. However, increasing inflation and rising interest rates are likely to affect housing demand in the short term.”

GlobalData further highlighted that the budget includes significant allocations for supporting sectors, such as renewable energy, healthcare, logistics and irrigation. To help the country reach its target of net-zero emissions by 2070, the government announced an allocation of INR350 billion (US$4.4 billion) for priority capital investments towards energy transition and net-zero objectives, and energy security.

The renewable energy sector is expected to witness an increase in investment over the coming years, given that ‘Green Growth’ is listed as one of the seven priorities in the latest budget. This will also help in facilitating transition of the economy to low-carbon intensity, and reducing dependence on fossil fuel imports.

© Laurentiu Morariu/Unsplash

India is set to invest in infrastructure development.

Ms Dayanand concluded, “The increase in capital expenditure outlay is expected to boost construction activity, by fast-tracking projects that have been delayed due to rising inflation and interest rates. However, headwinds such as delay in land acquisition, inadequate manpower, delay in receiving necessary permits, and rise in construction material prices could pose a downside risk to the industry’s output in 2023.” ■

Pan-United supplies CO2 mineralised concrete to Tuas Port, boosting decarbonisation in Singapore

Pan-United Corporation Ltd is driving sustainable change in Singapore's built environment with the use of 360,000 cu m of carbon dioxide (CO2) mineralised concrete over a 2.5-year period for Tuas Port. This specialised low-carbon concrete is a building material for the berths and stacking yards at the Phase One container berth project by PSA Corporation Ltd.

Upon completion in early 2024, Tuas Port Phase One will effectively become a man-made carbon sink that prevents the emission of over 113.8 million kg of CO2 from entering the atmosphere. This is said to be equivalent to planting 1.9 million tree seedlings or removing 24,500 cars from the road.

When fully completed in the 2040s, Tuas Port is set to be the world's largest fully automated port capable of handling 65 million TEUs (20-ft equivalent units) annually.

"We are delighted at PSA's commitment to the use of our CO2 mineralised concrete for its Tuas Port Phase One project. It will contribute to PSA's efforts to achieve net-zero carbon emissions by 2050," said May Ng, CEO of Pan-United. "We will continue to champion sustainability in Singapore and globally, and work alongside fellow industry leaders in our journey to reach new frontiers in decarbonising Singapore's built environment."

Unlike operational carbon emitted from buildings in use, embodied carbon is emitted throughout the construction process before a building is completed, i.e. from the manufacture of building materials right up to onsite work on a new building project, explained Pan-United. This fact makes it possible, during the design stage, to choose building materials and methods that can lower embodied carbon. Once a building is operational, carbon emissions can only be reduced from energy used in lighting, power and air-conditioning.

Ms Ng added, "So far, greening initiatives have focused largely on reducing operational carbon after the building is completed. Yet the best results can be achieved as early as the design stage if builders opt for low-carbon materials, such as CO2 mineralised concrete, to incur the lowest possible embodied carbon footprint for a building even before it comes in use."

© PSA Singapore

An artist's impression of Tuas Port when fully completed.

The production of CO2 mineralised concrete is a carbon capture and utilisation (CCU) technology that permanently embeds industrial waste CO2 as a mineral in concrete, said Pan-United, making it a carbon sink for embodied carbon emissions.

According to Pan-United, its CO2 mineralised concrete is the first and only such concrete to be inducted into the Singapore Green Building Council's new Ready-Mix Concrete (Carbon Capture & Utilisation) category. In the Green Mark 2021, CO2 mineralisation technology is listed in a newly-created 'Whole Life Carbon' category under an 'Innovation' section.

Pan-United further revealed that beyond Tuas Port, other notable developments in Singapore like the JTC semiconSpace, Avenue South Residence, Linde's gasification complex at Jurong Island and CapitaLand's 15-storey building at 3 Science Park Drive, have also used CO2 mineralised concrete. ■

Work on Tung Chung Line Extension project in HK to begin this year

The Hong Kong Government has approved the implementation of the Tung Chung Line Extension, announced MTR Corporation. Work on the project is expected to commence this year, with completion scheduled for 2029.

Under the project, the Tung Chung Line will extend westward by about 1.3 km, with a new terminus to be built in Tung Chung West and a new intermediate station at the Tung Chung East new reclamation area between the existing Sunny Bay and Tung Chung stations. The work will involve the diversion of a 1.2-km-long section of the operating tracks at Tung Chung East.

"With a mission to provide quality railway service, the [MTR] Corporation also staunchly supports the building of communities around rail stations in line with the government's strategy of making railways the backbone of public transport," said Dr Jacob Kam, CEO of MTR Corporation.

"The Tung Chung Line Extension will cater for the new town development in the Tung Chung East new reclamation area and Tung Chung West, enhancing the connectivity of Lantau North and support the long-term, sustainable growth in population and employment opportunities in the area."

MTR Corporation said it has been in close contact with the community for the implementation of the project, and will continue exchanging ideas with stakeholders. "During the construction, we will comply with the requirements of relevant laws to reduce the potential impact the works might bring to the community," added the company. "At the same time, we will strive to complete the project for service commencement as soon as possible to benefit the people of Hong Kong." ■

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Doosan rebrands as Develon

Doosan construction equipment has rebranded as 'Develon', announced Hyundai Doosan Infracore (HDI) recently. This change takes place a year and a half since August 2021 when HDI became a subsidiary of HD Hyundai (formerly Hyundai Heavy Industries Holdings Co).

According to HDI, Develon is a combination of the words 'Develop' and 'Onwards'. This new brand name conveys the direction of the company to move onwards to the future through innovation and its intention to relentlessly change the world with innovative products and solutions.

HDI is set to pursue its goal of becoming a global top-tier player in the construction equipment industry with the launch of the new brand.

TOP AND ABOVE: **Doosan construction equipment is now known as Develon.**

"Our three construction equipment businesses have already solidified their status as one of the key business pillars of HD Hyundai and have built an unwavering foundation for achieving performance targets and creating synergistic effects among them, amid the rapidly changing global economic environment," said Cho Young-cheul, CEO of HDI. "Develon will lead the future market of electrification and automation to spur growth and continue to be a brand of choice for our customers."

Following the rebranding, the new Develon decal will now be used on HDI's construction equipment. ■

Doka acquires 100% stake in scaffolding company AT-PAC

Global formwork manufacturer Doka has completed its 100% acquisition of scaffolding specialist AT-PAC. Both companies initially partnered in 2020 to provide comprehensive global site solutions. The acquisition positions Doka as a single source for formwork and scaffolding for the global construction industry and strengthens the company's new global business segment, 'Industrial Scaffolding'. For AT-PAC, this means full access to the global market.

Robert Hauser, CEO of Doka, said, "I am very enthusiastic about the opportunities that will be offered to existing and future customers, providing them with a wealth of knowledge, integrated products and turnkey solutions for formwork, shoring and scaffolding from a single source. This will allow us to continue to expand together and further strengthen our market position."

Josh Dundon, previously COO, has been named CEO of AT-PAC. "It is an exciting milestone for AT-PAC to become 100% part of Doka and thus the Umdasch Group family," said Mr Dundon. "It further strengthens and demonstrates the success of our partnership since its inception three years ago. The combination of Doka's industry-leading formwork solutions and extensive global sales network with AT-PAC's high quality products, services and talent will create incredible value for our customers and opportunities for our employees worldwide." ■

© Doka

With the acquisition, Doka serves as a single source for formwork and scaffolding.

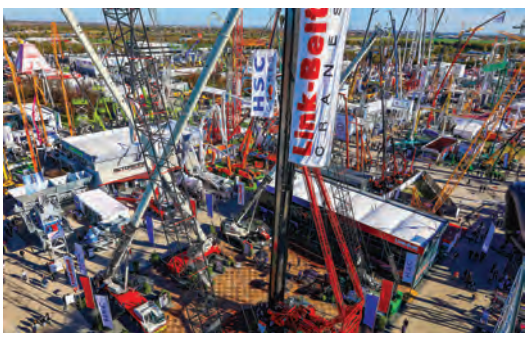
HSC becomes wholly owned subsidiary of Sumitomo Heavy Industries

Sumitomo Heavy Industries Ltd (SHI), the parent company of Link-Belt Cranes, has announced an agreement with Hitachi Construction Machinery Co Ltd (HCM) to acquire the shares of Sumitomo Heavy Industries Construction Cranes Co Ltd (HSC) held by HCM and make HSC a wholly owned subsidiary of SHI.

The share acquisition occurred effective 31 December 2022. SHI acquired the remaining 34% of shares held by HCM, thereby making HSC a 100% wholly owned subsidiary of SHI.

SHI stated that its business strategy is to grow and strengthen the construction crane business, to reinforce cooperation related to the lifting business within the SHI Group, and to solidify its logistics & construction segment business, which includes the construction machinery business.

Melvin Porter, CEO and president of Link-Belt Cranes, said, "This further reinforces SHI's long-term commitment and investment in the mobile crane business. We look forward to the continued growth and strengthening of the mobile crane business with the support of SHI and collaboration with HSC." ■



LEFT: **HSC participated in bauma 2022 together with its associated company Link-Belt Cranes.**

VDMA: Germany's construction equipment sector starts new year with momentum

Construction equipment manufacturers with production in Germany are showing themselves to be virtually unimpressed by the current crises, according to VDMA Construction – Equipment and Plant Engineering. A strong year-end spurt enabled them to increase turnover by 3% in real terms for 2022.

The mood among customers is largely good, according to feedback from participants at the annual meeting of the VDMA Construction Equipment Specialist Group in Frankfurt at the beginning of February. There are hardly any cancellations now.

In nominal terms, the industry reached a new record last year. Although the order intake in this period is down 21% due to a base effect – in 2021, the order intake went through the roof as a result of the economic recovery after the pandemic outbreak – the manufacturers are still benefiting from full order books that guarantee capacity utilisation at least until the middle of this year. The only negative trend at the moment is in building construction, as higher interest rates are putting massive pressure on the residential construction sector.

The global sales of construction machinery fell by 4% in 2022, which was entirely due to China, the largest market. A mix of the housing crisis and zero-Covid policies caused the market there to slump by 43%. North America and the European home market, on the other hand, grew at double-digit rates despite the supply bottlenecks. In Europe, growth was concentrated in Southern and Central Eastern Europe. The largest markets – Germany, France and Great Britain – were stable.

"Nobody fears production cutbacks due to the energy crisis; our manufacturers want to expand their workforce or at least keep it stable," affirmed Franz-Josef Paus, chairman of VDMA Construction – Equipment and Plant Engineering.

The industry expects strong impulses from Europe and North America. There, especially from Conexpo in Las Vegas, which will take place on 14-18 March 2023. The US' Infrastructure Act and the Inflation Reduction Act should continue to provide bright prospects for European suppliers to the construction industry.

"We are impressed by this positive development, and we can only hope that this trend continues. Our construction equipment sector is currently proving resilient to the energy crisis, inflation and supply chain disruptions," said Joachim Strobel, chairman of the VDMA's Construction Equipment Specialist Group. ■

* Kixx's hydraulic fluid lineup is formulated to provide strong protection, efficient operation in a wide range of temperatures and extended equipment service life.

Kixx Hydraulic Fluids – *The Perfect Fit for Your Machinery*

Hydraulic systems are a crucial part of machinery used in a broad range of industries, including manufacturing, construction, mining, agriculture, and marine fields. Hydraulic fluid plays a vital role in these systems, transferring power, dissipating heat, generating sealing film to prevent leakage, providing thorough lubrication, and removing contaminants. Quality hydraulic fluid eliminates the risk of wear and makes sure machinery maintains a reliable performance.

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Kixx has been collaborating with global manufacturers for over 20 years, providing them with the premium industrial lubricants they need to excel. Kixx's hydraulic fluids meet and exceed the construction industry's strictest OEM standards, including those set by Volvo, Doosan, Hyundai, Posco and Kobelco Construction Equipment. Kixx provides a full and expansive range of hydraulic fluids, all underpinned by technology that has earned the trust of manufacturers the world over.

Kixx's Versatile Hydraulic Fluid Lineup

Industrial machinery can be very costly, hence the need for high quality hydraulic fluids to maintain and lengthen their service life. Kixx's hydraulic fluids are formulated to offer strong protection to equipment parts. They also contribute to stable and efficient operation in higher temperature environments by providing excellent sludge control through superior thermal and oxidation stability.

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- **Kixx Hydro HVI/HVZ** Top tier hydraulic fluid with a high viscosity index, suitable for a wide range of temperatures
- **Kixx Hydro XW/AF** Specially formulated to maximize anti-wear performance and ideal for circulating systems where a rust and oxidation inhibitor is required
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- **Kixx Hydrosafety** Specifically designed for equipment requiring fire-resistance features
- **Kixx RD BIO** Kixx's latest hydraulic fluid synthesizing top performance with sustainability

They help maintain the value of equipment by enhancing equipment's durability and also save on maintenance costs by extending oil change intervals and lowering energy consumption rates. Kixx's hydraulic fluids are the ideal choice for those seeking to reduce TCO, boost performance, improve efficiency and strengthen reliability.

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Work starts on Singapore's seventh and eighth MRT lines

Jurong Region Line

The Land Transport Authority (LTA) has commenced the construction of Singapore's seventh MRT line, the Jurong Region Line (JRL), with a groundbreaking and viaduct launching ceremony on 13 January 2023.

The JRL, a 24-km-long elevated MRT line with 24 stations including three interchange stations at Boon Lay, Choa Chu Kang and Jurong East, is scheduled to open in three stages from 2027 to 2029. This new rail network is expected to significantly improve connectivity in the western part of Singapore and support developments in the Jurong area.

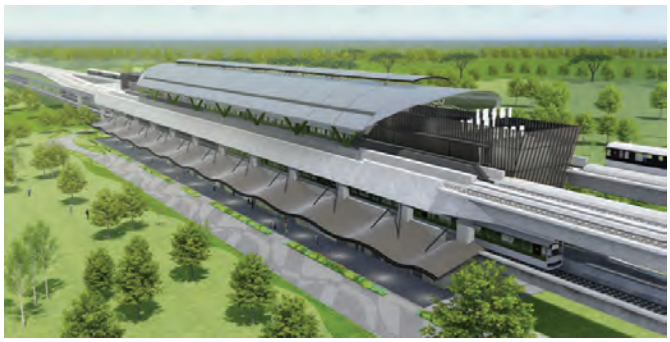
The JRL is expected to add more than 60,000 additional households within a 10-minute walk from a train station. It will connect residential areas including Gek Poh and Pandan Gardens to key activity nodes in Jurong that currently do not have direct links to the MRT network, such as the Jurong Industrial Estate, Jurong Innovation District and Nanyang Technological University (NTU).

The line will also support the development of the Jurong Lake District, which is set to be the largest commercial hub outside the central business district. The JRL's ridership is expected to reach 200,000 daily in the initial years and rise to more than 500,000 a day when the Jurong Innovation District, Tengah Town and Jurong Lake District are fully developed.

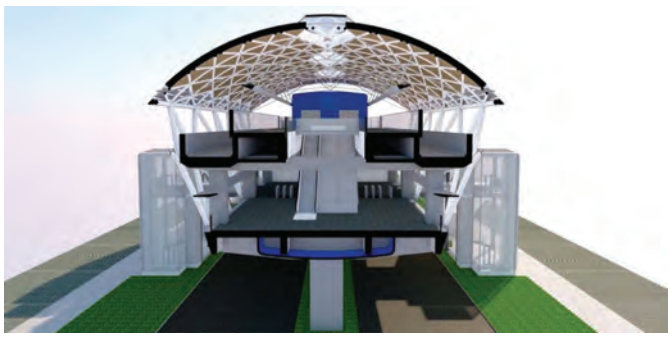
Constructing the JRL through a mature and densely developed corridor is challenging, as works are carried out along an alignment with curves and limited space over busy roads, major expressways and canals, explained LTA. Slightly narrower and shorter carriages will enable the train to negotiate and manoeuvre through these curves at built-up areas along the JRL track.

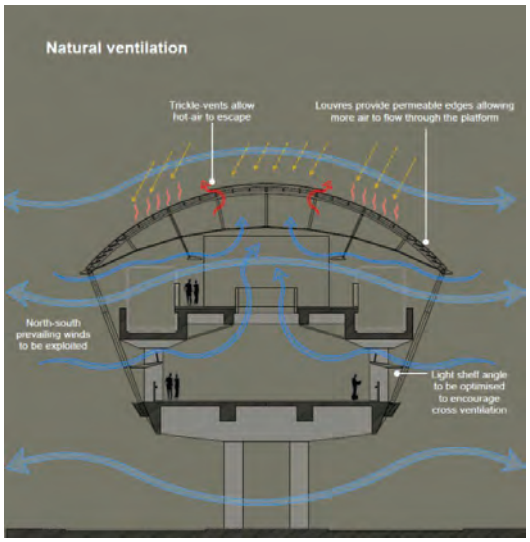
As the JRL is designed to navigate through existing developments, minimising noise disturbance is a key design consideration. Thus, permanent noise barriers will be installed along viaducts that are near residential areas.

LTA said it has undertaken extensive planning and rolled out a number of mitigating measures to minimise disruptions to traffic and the environment. Traffic diversions along Choa Chu Kang Avenue 3, Jurong East Central and Jurong West Avenue 4 have been successfully implemented to allow for the construction of stations and viaduct structures.



TOP AND ABOVE: **Artist's impressions of two MRT stations in Tengah Town, part of the Jurong Region Line (JRL).**





ABOVE AND LEFT: **The JRL stations are designed to allow crossflow natural ventilation.**

FAR LEFT: **Map of the JRL project with key landmarks.**

Moreover, all JRL stations will be fitted with photovoltaic (PV) solar panels, generating renewable energy for station operations, added LTA. The PVs will help reduce carbon footprint of JRL operations by providing a constant source of power with little to no greenhouse gas emissions. The JRL stations are also designed to allow crossflow natural ventilation to reduce mechanical energy usage from fans and air-conditioning.

Cross Island Line

LTA also marked the start of the Cross Island Line (CRL) Phase 1 construction with a groundbreaking ceremony on 18 January 2023. The CRL will be Singapore's eighth and longest fully-underground MRT line at more than 50 km long when fully completed. It will serve the existing and future developments in the eastern, western and northeastern corridors, linking major hubs such as the Jurong Lake District, Punggol Digital District and Changi.

The projected daily ridership of the entire CRL is more than 600,000 commuters in the initial years from 2030, increasing to over 1 million in the longer term. It will be constructed and opened in three phases.

The first phase – CRL Phase 1 – spans 29 km and comprises 12 stations from Aviation Park to Bright Hill. This will serve residential and industrial areas such as Loyang, Hougang and Ang Mo Kio.

Construction of the CRL Phase 1 is expected to be completed by 2030. It will be linked to East-West Line at Pasir Ris station, North-East Line at Hougang station, North-South Line at Ang Mo Kio station and Thomson-East Coast Line at Bright Hill station.

The CRL Bright Hill station will also be connected to a new Transit Priority Corridor (TPC) along Sin Ming Avenue to allow multi-modal transfer to the bus and active mobility networks. The 2-km stretch of TPC, which is scheduled for completion in 2029, will consist of a dedicated bus lane, new cycling paths and wider footpaths.

LTA revealed that various technologies have been adopted for the CRL project to improve construction efficiency and safety. These include the use of virtual reality and augmented reality tools to enhance capabilities and facilitate coordination. Productivity is further increased through platforms such as computer simulations of different operating scenarios at the Changi East Depot.

Large-diameter tunnel boring machines (TBMs) will be used to construct various stretches of tunnels between the CRL stations, including between Aviation Park and Loyang stations. According to LTA, the 12.6-m-diameter TBMs will only have to bore through the ground once for the construction of the tunnel with two tracks eventually housed in it. This will be the largest TBM to be deployed on an LTA rail project and it is expected to increase work productivity and reduce manpower requirements.

Construction works for the paid transfer link to the existing East-West Line (EWL) Pasir Ris station are also ongoing, said LTA. Due to site constraints at the track viaduct, specialised equipment – like a low-headroom mobile crane – has been deployed for works such as the construction of the diaphragm wall.

LTA further shared that at the CRL Teck Ghee station, a rectangular TBM will be used for the construction of the underground linkways. To enhance overall construction productivity and safety, LTA will be adopting the trenchless method, where operational parameters during tunnelling are controlled to minimise surface settlement. Other innovative construction methods will also be explored on the CRL project to improve overall construction productivity and safety.

LTA is progressively calling tenders for CRL Phase 2, which comprises six stations from Turf City to Jurong Lake District, while engineering studies are ongoing for the third phase. ■

FROM TOP TO LEFT: **Artist's impressions of Loyang station, Teck Ghee station, Ang Mo Kio station and Tampines North station, part of the Cross Island Line (CRL).**

The CRL Phase 1 alignment map.

CALENDAR OF EVENTS

// Events in Asia

Geo Connect Asia
15 to 16 Mar 2023
Sands Expo & Convention Centre
Marina Bay Sands, Singapore
Website: www.geoconnectasia.com

BuildTech Asia
28 to 30 Mar 2023
Singapore Expo
Singapore
Website: www.buildtechasia.com

CICEE (Changsha International Construction Equipment Exhibition)
12 to 15 May 2023
Changsha International Convention & Exhibition Centre
Changsha, China
Website: www.chinacicee.com

K-Con Safety Expo (Korea International Construction & Industrial Safety Expo)
13 to 15 Sept 2023
Korea International Exhibition Centre (KINTEX)
Goyang, South Korea
Website: www.k-consafetyexpo.com

CBA Expo (ConsBuild Asia)
13 to 15 Sept 2023
Bangkok International Trade & Exhibition Centre (BITEC)
Bangkok, Thailand
Website: www.consbuildasia.com

BCT Expo (Building Construction Technology Expo)
20 to 22 Sept 2023
Impact Exhibition and Convention Centre
Bangkok, Thailand
Website: www.bct-construction.com

BICES
20 to 23 Sept 2023
China International Exhibition Centre (New Venue)
Beijing, China
Website: www.e-bices.org

Infrastructure Connect!
1 to 3 Nov 2023
Indonesia Convention Exhibition
Tangerang, Indonesia
Website: www.infrastructureconnect.id

Philconstruct
9 to 12 Nov 2023
SMX Convention Centre Manila &
World Trade Centre Metro Manila
Metro Manila, the Philippines
Website: www.manila.philconstructevents.com

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

// Events outside Asia

Conexpo-Con/Agg
14 to 18 Mar 2023
Las Vegas Convention Centre
Las Vegas, Nevada, USA
Website: www.conexpoconagg.com

Samoter
3 to 7 May 2023
Veronafiere Exhibition Centre
Verona, Italy
Website: www.samoter.it

World of Concrete
23 to 25 Jan 2024
Las Vegas Convention Centre
Las Vegas, Nevada, 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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HYBRID EDITION

Incorporating HVAC/R VISAYAS HYBRID EDITION

June 22 - 24, 2023

Waterfront Cebu City,
Hotel & Casino, Lahug and online

PHILCONSTRUCT MINDANAO
HYBRID EDITION

Incorporating HVAC/R MINDANAO HYBRID EDITION

September 7 - 9, 2023

SMX Convention Center Davao,
SM Lanang Premier and online

PHILCONSTRUCT
HYBRID EDITION

Incorporating HVAC/R PHILS. HYBRID EDITION

November 9 - 12, 2023

SMX Convention Center Manila,
World Trade Center Metro Manila and online

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Shortlisted entrants revealed for IAPAs 2023 categories

Shortlists for the International Awards for Powered Access (IAPAs) 2023 have been announced, following a meeting of the judges' panel. The panel of five industry experts shortlisted companies and individuals in each of the 13 awards categories, with the winners set to be announced at a gala ceremony on 20 April on the evening of the IPAF Summit in Germany. Both events will be held at the H4 Hotel Berlin Alexanderplatz.

There were more than 120 entries received for this year's awards. The 13 categories range from new products and innovations to sustainability and safety, and include a new category: Equality, Diversity and Inclusion (EDI) Award, inspired by IPAF's Women in Powered Access initiative. The shortlisted entrants are as follows:

Access Rental Company of the Year
- Horizon Construction Development, China
- Mills, Brazil
- Nationwide Platforms, UK
- Sunbelt Rentals, UK

Contribution to Safe Working at Height
- Manitou, France
- Nationwide Platforms, UK
- Protective Pty, Australia
- Sunbelt Rentals, UK

The Sustainability Award
- Haulotte, France
- Genie, USA
- MEC, USA
- Palfinger Platforms, Germany

Digital Development Award
- Alimak, Sweden
- Digiquip, Norway
- Nationwide Platforms, UK
- Serious Labs, Canada

Equality, Diversity & Inclusion (EDI) Award
- Vicki Allen – International Platforms, UK
- Dayim Equipment Rentals, Saudi Arabia
- Mills, Brazil

Innovative Technology Prize
- Mateco Romania – trouble shooting ecosystem
- Nationwide Platforms, UK – Harness On, Phase 2
- Protective Pty, Australia – Scissor shield

Product of the Year categories

Mast Climbing Work Platforms and Hoists
- Alba-Macrel Group, Spain – PMH passenger & materials hoist
- Maber Hoist, Italy – MBC2000 transport platform
- Torgar, Spain – PW-18 mast climber
- XL Industries, France – XE5 top-down hoist

Scissor Lifts and Vertical Mast Platforms
- JLG, USA/UK – Power Towers Duo
- MEC, USA – MMAE16 vertical mast lift
- Skyjack, Canada – E Series vertical mast lift

Self-propelled Booms and Atrium Lifts
- Almacrawler, Italy – Jibbi 1890 Primo self-levelling boom lift

This year's winners will be announced at a gala ceremony on 20 April on the evening of the IPAF Summit in Germany. Both events will be held at the H4 Hotel Berlin Alexanderplatz.

- Hinowa, Italy – Lightlift 40.18 spider lift
- Manitou, France – 160 ATJ+e electric boom lift

Vehicle and Trailer-mounted Platforms
- Elliott Equipment Company, USA – E150i truck mount
- France Elévateur, France – UPTO 15 van-mounted platform
- Ruthmann Holdings, Germany – Steiger Ampero TBR 260 E truck mount
- Palfinger Platforms, Germany – All-terrain Unimog-mounted platform

IPAF member companies and individuals only

IPAF Training Centre of the Year
- Dayim Equipment Rentals, Saudi Arabia
- Mills, Brazil
- Nationwide Platforms, UK
- Speedy Training, UK

IPAF Training Instructor of the Year
- Anna Sarah Costa Morais – Mills, Brazil
- Gonçalo Pereira – Transgrua, Portugal
- Uta Koch – Koch Arbeitsbühnen, Germany

Access International/IPAF Lifetime Achievement Award
To be announced at the ceremony.

Peter Douglas, CEO and managing director of IPAF, said, "For the second year running, we have had a superb set of entries across the various awards categories, and looking at the shortlist reveals what stiff competition there has been. I do not envy the judges having to select their shortlists from such a strong field!

"Like all those who have already booked their places to join us at what is already a sell-out event, I can't wait to find out who each category winner will be and I am really looking forward to what promises to be a really special evening. It will be particularly exciting to be hosting both the IPAF Summit and IAPAs in Germany's historic capital, Berlin; I hope we will see you there!" ■

Website: www.iapa-summit.info

Note: All companies shortlisted will be offered two free tickets to the awards dinner, with a maximum of two free tickets across all categories. Please email events@ipaf.org to claim your free tickets.

Guidance to reduce entrapments and crushing incidents

Revised safety guidance has been published explaining how to reduce the risks of trapping and crushing incidents when using mobile elevating work platforms (MEWPs). Published by the Construction Industry Plant Safety Group (CIPSG), the 'Good Practice Guidance for Reducing Trapping/Crushing Injuries to People in MEWPs' was developed in partnership with the International Powered Access Federation (IPAF).

The guidance document is now available to view and download free of charge from either the IPAF or CPA websites. Compiled by the CIPSG for MEWPs, it is chaired by the Construction Plant-hire Association (CPA) and administered and supported by IPAF.

MEWPs are widely acknowledged to be one of the safest and most efficient means of enabling temporary working at height. Between 2016 and 2020, incidents entered into the IPAF reporting portal from 15 countries identified that 73 people died in entrapment incidents globally.

Entrapment injuries to persons in MEWPs are usually serious and often fatal. The guidance has been produced by the CIPSG for MEWPs to raise awareness of the risks and covers the measures that can be used to reduce them. It contains guidance on planning, risk assessment, MEWP selection, operator training, familiarisation and rescue. Emphasis is placed on the practical measures that MEWP users can take to avoid entrapment.

The guidance was originally published in 2010, and has undergone significant revision in this latest version. The document has been restructured to improve readability and understanding of the topic and new illustrations have been added.

The content reflects and builds upon findings from the recently published Health & Safety Executive Research Report (HSE RR1180:2022), which examined the effectiveness of secondary guarding when employed in a range of different entrapment scenarios.

"This updated guidance has taken a while to develop, but it was much-needed, as data gathered via IPAF's reporting portal shows that entrapment is consistently one of the top five causes of serious injuries and deaths when using MEWPs," said Brian Parker, head of safety & technical at IPAF.

"Much work and cross-industry consultation has gone into this document to ensure it is comprehensive, clear and concise. The powered access industry has changed significantly over the past five to 10 years, with technological advancements driving secondary guarding devices, and machine capabilities and complexities. Meanwhile, the breadth of industry [and] applications has developed considerably over that period.

"We feel this new guidance document adequately encompasses all of these changes and provides an important point of reference to aid in minimising entrapment risks for all those planning, executing and supervising work at height using MEWPs. We are pleased to see it published for users to read and download completely free of charge."

Kevin Minton, chair of the CIPSG for MEWPs, added, "The guidance will be a vital reference tool for MEWP hire companies, customers, operators and manufacturers. Presented in easily digestible sections, it is aimed at those using and supervising MEWPs, and those responsible for rescuing entrapped people, as well as anyone involved in planning and risk assessing work with MEWPs, specifying equipment, managing the work or organising training. We anticipate it will prove to be a useful training tool, as it has been designed to be used in briefings or toolbox talks for supervisors and MEWP operators."

The CIPSG for MEWPs has membership from the CPA, IPAF, HSE and Fall Arrest Safety Equipment and Training (FASET), as well as significant representation from MEWP owners, manufacturers and major construction companies. It meets regularly to share information on MEWPs safety, and has set up working groups to produce guidance and address specific issues. ■

Website: www.ipaf.org/resources

World of Concrete returns with strong attendance

Informa Markets' World of Concrete, the world's largest trade show fostering the growing concrete and masonry construction industries, has concluded its 49th edition that took place from 17 to 19 January 2023 at the Las Vegas Convention Centre (LVCC). With 48,009 registered professionals and over 120 countries in attendance, the event further solidifies itself as the critical meeting place for industry advancement.

"The 2023 edition of World of Concrete far exceeded our expectations. The crowded show floor and packed educational sessions proves how essential meeting face to face is, that it remains important now more than ever to have a space to connect, to learn, to share across the concrete, masonry and construction industries as a vital contributor to our economy," said Jackie James, vice president of World of Concrete. "In-person attendance is on its way back to pre-pandemic levels and the World of Concrete event leads global trends in construction."

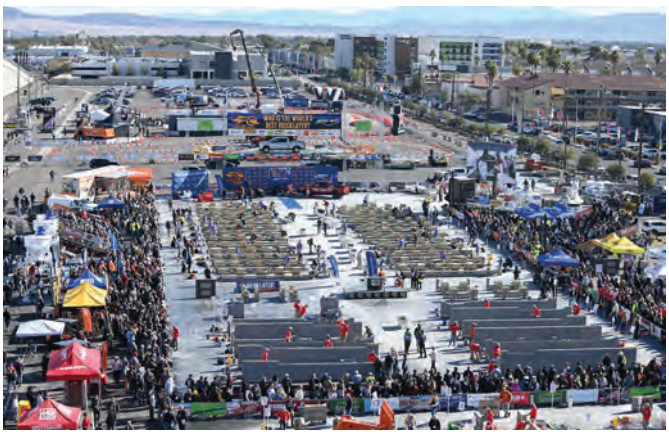
World of Concrete took more than 587,000 net sq ft of the convention centre, with both indoor and outdoor spaces full of product displays, demonstrations and competitions. Some highlights included unveiling of exciting new innovations, such as the first-ever mobile 3D robotic concrete printer and AI site map printer, top-of-the-line work trucks with electric batteries and aerodynamic improvements, and the widest range of original manufactured equipment from excavators to wireless concrete sensors, AI-based platforms and modern materials like the eco-driven autoclaved aerated concrete (AAC).

Returning for the 18th consecutive year, the Concrete Industry Management (CIM) programme held its silent & live auctions, generating a record-breaking fund of more than US$2.1 million. Live auction and online donations fuelled the grant for the programme designed to prepare students for the concrete workforce early in their careers.

The CIM programme provides students with a Bachelor of Science degree in Concrete Industry Management, a business programme specifically developed for the concrete industry. The proceeds from the 2023 CIM Auction will benefit the CIM National Steering Committee (NSC) and support the current CIM programme at Middle Tennessee State University, New Jersey Institute of Technology, Texas State University, California State University – Chico, South Dakota State University, the Executive MBA programme, as well as help fund scholarships. World of Concrete has also donated US$15,000 to the CIM education programme for the second consecutive year.

The 2023 edition of the Spec Mix Bricklayer 500 competition was held on Wednesday, 18 January. The winner, mason Michael Schlund, a Wisconsin native and his tender, Arron Kowalski, laid 759 bricks in one hour, and Mr Schlund was crowned 'World's Best Bricklayer' leaving with a new Ford F250 4x4 Super Duty truck, an Essick Pro12 mixer, and more than US$15,000 in cash and prizes. Scott Tuttle, mason, and Brian Tuttle, tender, took second place with 716 bricks in one hour.

This year's World of Concrete also offered more than 160 technical sessions, including hands-on training, safety expertise and business development. New additions to the 2023 education programme were eight concrete basics and leadership courses presented in Spanish, a revamped three-hour comprehensive concrete repair track, and new workshops focusing specifically on women in construction.



ALL IMAGES: **World of Concrete 2023 took place from 17 to 19 January, drawing 48,009 registered professionals.**

World of Concrete will return in 2024 for its 50th anniversary, slated for 23 to 25 January (education: 22 to 25 January) in Las Vegas. ■

Website: www.worldofconcrete.com

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CABE holds its first conference for Asia Pacific region

The Chartered Association of Building Engineers (CABE) has held its inaugural conference for Asia Pacific region in Hong Kong. The event was hosted at the New Millennium Hotel and live on Zoom on 17 February 2023.

The theme for the conference was 'Constructing our Future'. "As we emerge from the pandemic, it is essential that we turn our attention to the future. The construction industry is evolving so quickly, and whilst this presents many opportunities, it also presents many challenges," said CABE.

The conference speakers included: Ar. Donald Choi, executive director and CEO at Chinachem Group; Ir. Prof. Thomas Chan, executive director at WSP (Asia) Limited; Dr. Raymond Yau, general manager, technical services & sustainable development at Swire Properties Limited; Victor Tai JP , Under Secretary for Housing at HKSAR Government; and Clarice Yu JP, Director of Buildings at HKSAR Government.

Sharing their expertise and technical knowledge with the audience, the speakers identified and explored the challenges and presented future solutions and innovations.

Themed 'Constructing our Future', the conference took place in Hong Kong.

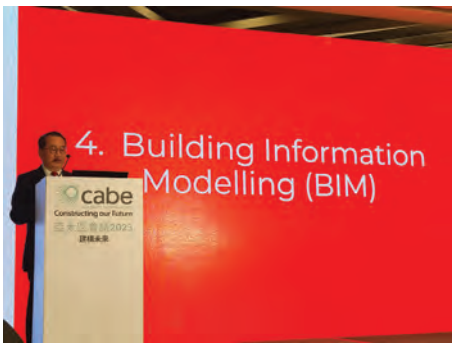
Ageing workforce

One of the biggest challenges in the construction industry is its ageing workforce – over 40% of those working in the construction industry in Hong Kong are over 55 – and it was acknowledged that there is a need to do more to encourage young people into the industry.

"It is an exciting industry – an industry that is embracing modern methods of construction, new technologies and new innovation, but young people are failing to recognise just how exciting the industry is and dismissing it as a career," said CABE.

"It is time to change, and some of this change will come from new, innovative digital technologies – AI, BIM, drones, robotics, computer simulation tools – and as professionals, we need to continue to embrace this technology."

CABE pointed out that "these opportunities to create a modern culture for the industry, tools that will facilitate modern decision-making, drive efficiencies, improve safety structures and introduce new methods of working will change the face of the construction industry, and digital evolution is now a must to ensure the continual success of the sector."



ABOVE: **Donald Choi, executive director and CEO at Chinachem Group.**

LEFT: **Ir. Prof. Thomas Chan, executive director at WSP (Asia) Limited.**

Sustainability

The speakers further explored the opportunities to decarbonise commercial buildings. They looked at how to implement net-zero carbon projects into the industry, and how to record robust construction data that can identify consumption, benchmark and compare usage as well as identify trends.

The audience was reminded that, it is only when we can understand what the data is telling us that we can make effective and informed decisions, thus allowing us to create smart energy management platforms and climate resilient designs for all new development projects.

Design for well-being in public housing was explored in detail, with proven evidence demonstrating that when we consider the wellness of the building inhabitants, we can enrich people's living standards. This should now be a critical consideration in the design of future buildings and is a key focus for CABE and its members.

The future of the construction industry is dependent on professionals collaborating, sharing knowledge and discussing solutions, highlighted CABE. Collaboration is a key part of the association's values, and it encourages professionals throughout the industry to "embrace as many opportunities to come together – to discover more, to learn more. It is only by collaboration that members and professionals will adapt to the needs of the industry and build a better future for everyone."

The sponsors of the conference included Wanson Construction Company Limited, Pruden, S K K (HK) Co Ltd, Shinny Performance Training Centre, and KYSS Properties Limited.

Based in the UK, CABE opened its first international office in Hong Kong in 2020. This Asia Pacific office aims to strengthens the links between CABE HQ and members in the region. ■

Website: www.cbuilde.com

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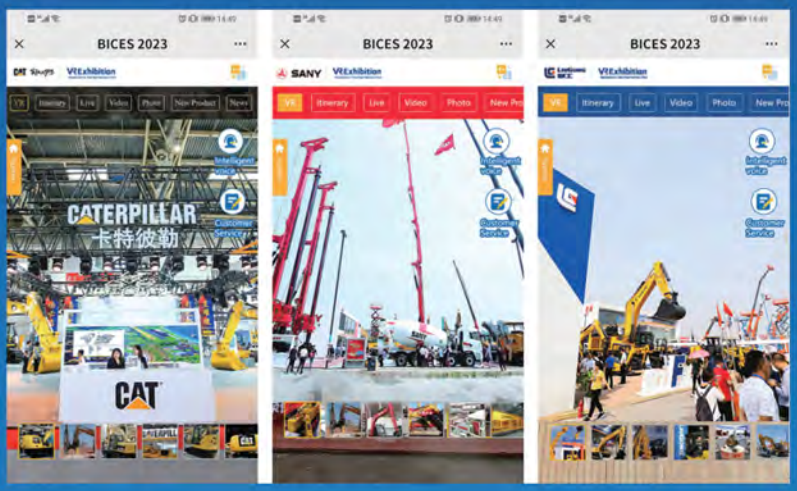

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Snorkel introduces S3013E electric scissor lift

Joining Snorkel's line of electric scissor lifts, the new S3013E was unveiled recently at the American Rental Association (ARA) show that took place on 12-15 February 2023. The machine has been developed to address specific needs in the low-level scissor lift market.

The S3013E mini scissor offers the versatility of a compact scissor with all the features that make Snorkel's larger electric lifts popular. This model was designed to be environment-friendly as well, with an electric drive for zero emissions and reduced noise. The electric drive also eliminates external hoses, and therefore potential leaks.

Compared to its closest Snorkel counterpart — the S3215E — the S3013E is equipped with better drive motors to make it even more robust. Other new features include tamper-proof trays, tie-downs and mitered stack edges for a smooth edge.

Snorkel's S3013E fits between the S3215E slab scissor and the lightweight S3010E in terms of size and features. The S3013E offers the compact dimensions of the S3010E while adding an extending deck, which is common on all larger models.

The new S3013E has a maximum working height of 19 ft and a platform size of 29.5 ft x 52 in (stowed) and 29.5 ft x 76 in (extended), with a 600-lb maximum platform capacity.

In addition, the S3013E shares the fixed control box design with all Snorkel scissors, which is proven to reduce damage costs and save downtime on the jobsite. The component layout is designed for ease of maintenance, reducing service time to a minimum.

Website: www.snorkellifts.com

LEFT: **The Snorkel S3013E has been developed to address specific needs in the low-level scissor lift market. The machine features an electric drive for zero emissions and reduced noise.**

Doka upgrades Framax Xlife plus wall formwork

Doka has introduced a new system height to its popular Doka Framax framed formwork range. Framax Xlife plus is a next-generation tie-system designed for lightning-fast assembly. New accessories make working on the formwork even more efficient.

With a new formwork system height of 3.00 m and only two tying levels required, the Framax Xlife plus family ensures more economical forming. The enhanced product enables single-person operations, requires 12% fewer ties than similar systems, is operable from just one side without the need for jacket tubes and cones, and enables lightning-fast anchoring.

All elements are anchored in the centre, which reduces the number of ties and creates a harmonious tie pattern suitable for exposed concrete projects. And as the industry faces an increasing shortage of skilled workers, Framax Xlife plus helps streamline construction projects and reduces budgets.

Increased application versatility is supported by the integrated open functional profiles, as well as the attachment of add-on parts such as brackets, panel struts and walings. Framax Xlife plus is fully compatible with the Framax Xlife formwork panels; both formwork systems use the same accessories, e.g. lanyards, clamping rails, platforms, parking and setting aids.

Framax Xlife plus system logic optimises utilisation and logistics for improved component management with integrated form tie nuts – simplifying and speeding-up assembly and disassembly. The large panels can be used in horizontal and vertical positions, allowing horizontal stacking with smaller panels. All panels are produced with hot-dip galvanised and powder-coated frames. This ensures rust prevention, fast and easy cleaning, and a long lifespan.

The Framax Xlife plus wall formwork is now extended with a new system height of 3.00 m.

In addition, Doka has come up with some helpful tools for erecting and dismantling formwork. These include the Framax positioning lever, which allows formwork braces to be set up quickly, easily, and in a way that is gentle on the material. The new Framax aligning clamp make it possible to erect extensions of up to 6.60 m with just one part. ■

Website: www.doka.com

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Wirtgen unveils automatic steering system for WR-series

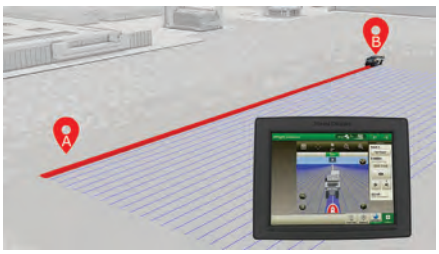
Wirtgen has launched the AutoTrac automatic steering system for its WR-series cold recyclers and soil stabilisers. By enabling precise, automatic steering, this system helps the machines achieve greater process efficiency and, as a result, a high degree of environmental compatibility.

The AutoTrac system steers the machine precisely within tolerances reckoned in centimetres on the basis of a previously calculated reference strip and a specified overlap of adjacent strips, enabling consistent utilisation of the machine's ideal working width.

AutoTrac relies, among other things, on various global navigation satellite systems (GNSS) for precise determination of the machine's position and direction of travel. The system is operated from an additional control panel that also enables the operator to view information about the position of the machine and previously completed strips.

Considering the sum of the large, avoidable overlaps with neighbouring strips that can occur in manual operations and the corresponding wastage of resources, the potential savings the system can bring soon become obvious. Keeping to the pre-set overlaps reduces the consumption of binding agents, consumables and fuel, makes the carbon footprint smaller and shortens the project completion time. The outcome of this is increased process efficiency and, in consequence, greater cost-effectiveness and environmental compatibility.

Manual steering of the machine always requires considerable effort when it comes to avoiding unprocessed gaps in the ground being worked. Here again, the automatic steering system assists the operator and reduces the workload. Maintaining the desired overlap avoids unwanted gaps in the final results. Knowing this allows the operator to concentrate fully on the mixing process and keep an eye on what's going on around the machine. ■



ABOVE AND LEFT: **The new AutoTrac automatic steering system makes Wirtgen cold recyclers and soil stabilisers more efficient.**

Website: www.wirtgen.com

Comfort cabin for Wirtgen compact milling machines

Wirtgen's F-series compact milling machines, which range from the W 100 Fi to W 130 Fi models, can now be fitted with a comfort cabin. This fully enclosed cabin offers a comfortable, low-fatigue workplace and provides effective protection against noise emissions. At the same time, it protects the operator when working in all-weather conditions – no matter whether it's windy, rainy, cold or sunny and hot.

The cabin air is cleaned by a filter system, while the temperature is controlled by an automatic air conditioning and heating system. The cabin is also constructed as a positive-pressure system to prevent the ingress of dirt, dust and hazardous materials into the operator's workplace – so that the area always stays dry and clean regardless of the weather conditions, and also when transporting the machine.

TOP AND ABOVE: **The fully enclosed cabin offers a comfortable workplace and provides effective protection against noise emissions.**

The increased comfort and lower impact of environmental influences inside the cabin reduce stress and fatigue. The working environment is enhanced with state-of-the-art control elements and innovative assistance systems, ensuring that important factors that contribute to safety and productivity, such as concentration and physical or mental capabilities, are not impaired in any way.

In addition, the ambient noise level is so low that the operator can make hands-free phone calls from the cabin. For communication on the construction site, the operator can either use a radio headset or open the easily accessible side window to talk with the crew on the ground.

When closed and locked, the operator cabin and all control elements are securely protected against vandalism. It is no longer necessary to remove and stow protection covers or open up fold-away control panels at the start of work or vice versa at the end of the working day. ■

New track-bound pile driver from RTG Rammtechnik

RTG Rammtechnik GmbH, a member of Bauer Maschinen Group, has developed a track-bound drilling rig and pile driver in collaboration with Leipzig-based company Techne and with the assistance of Hering Bau GmbH & Co KG.

According to Bauer, in the future, this equipment will make it possible to implement foundation types and depths that previously seemed unviable for the track.

The overall system is comprised primarily of the base carrier with leader based on an RTG RG 18 S, one flat carriage to support the leader, and another flat carriage for the transport and setup of the attachment parts. When the leader is raised, the equipment reaches a constructional height of approximately 23 m.

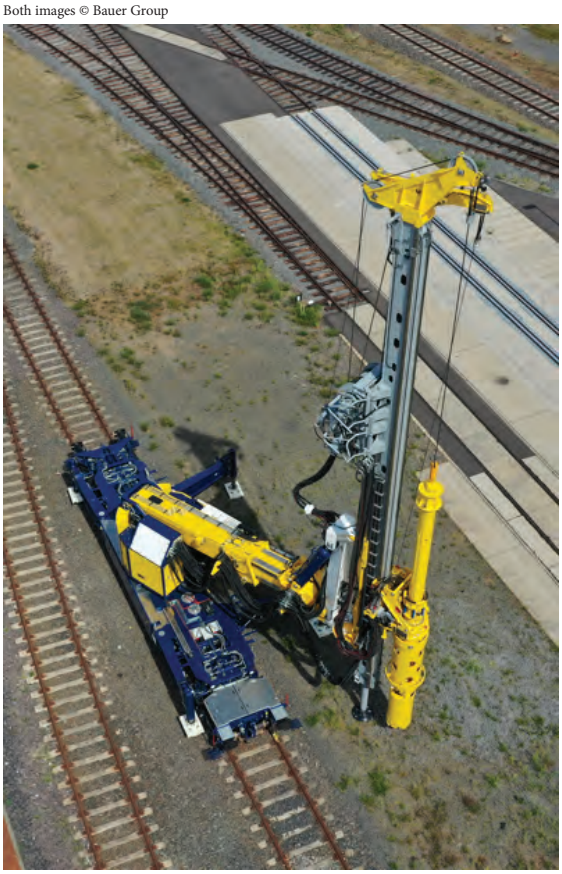
The leader has a main winch with 170 kN, a pull-down winch with 200 kN, and an auxiliary winch with 55 kN. A mast inclination of 5° in all directions can be achieved during operation to compensate the formation level.

In addition, the leader can be swiveled by 90° around the axis of the telescoping arm on either side, so it can always be brought into the desired operating position with respect to the upper carriage. The leader arm can be telescoped up to 2 m. The connection is bolted hydraulically. The telescopic boom allows rapid and precise positioning at the operating point.

This new machine has a transport length of roughly 15 m and operates on a track width of 1,435 mm. The transport weight is below 110 t, which enables transport without approval. The upper carriage protrudes a maximum of 1.55 m from the track axis, which means that traffic can continue on the adjacent track.

Between the leader and the main equipment, only the hydraulic lines are permanently connected in transport position. This concept enables transport as a normal railway vehicle. The connection between the telescopic arm and leader is bolted and then loosened for transport and storing the leader, or tightened for mounting the leader. In transport position, the equipment height is less than 4.30 m.

Both images © Bauer Group



From pile construction to the installation of sheet pile walls, to soil mixing techniques and soil improvement, all methods that are possible with a conventional RG pile driver can be implemented within a wide work front of more than 9 m from the track axis. The base carrier allows for continuous rotation of 360° around the upper carriage axis. The operator can control all functions of the upper carriage and undercarriage from the operator's cab.

Furthermore, all operating functions of the machine can be controlled from the outside using a wireless remote control. As a result, the operator does not necessarily have to remain in the operator's cab. This facilitates handling under restricted or difficult operating conditions.

"A track-bound machine with these specific performance characteristics is unique on the world market," said Bernhard Lindermair, managing director of RTG Rammtechnik GmbH. "In addition, the equipment can be used during shutdowns, as setup and operation is possible with an installed overhead line. The first client-owned equipment will be implemented at a jobsite in March 2023." ■

Website: www.bauer.de

LEFT (ABOVE): **The machine can be transported as a normal railway vehicle, because in transport position, only the hydraulic lines between the leader and the main equipment are permanently connected.**

LEFT: **The overall system consists of the base carrier with leader based on an RTG RG 18 S, one flat carriage to support the leader, and another flat carriage for the transport and setup of the attachment parts.**

Tadano debuts TM-ZX1205HRS loader crane in Thailand

Tadano recently launched its new TM-ZX1205HRS loader crane in Thailand. The launch event was held by Tadano Italthai – the importer and distributor of Tadano-branded cranes and lifting equipment for Thailand and Laos – in November 2022 at Saha Crane Auction Co Ltd, a newly appointed dealer for Tadano TM cranes.

The new loader crane with a 12-t capacity features the latest safety system called 'Safety Eyes' built in Japan, said Shigeki Nozawa, managing director of Tadano Italthai Co Ltd. The company revealed that this 12-t maximum lifting capacity is a completely new range for a Tadano TM crane, bridging the gap between the 10 t/15 tm TM-ZX1000 and 15 t/30 tm TM-ZX1500 series models.

The TM-ZX1205HRS is one of three models in Tadano's new TM-ZX1200 series. Like its accompanying HS and MH models, the TM-ZX1205HRS (HRS model) achieves a maximum outrigger width of 5.5 m and maximum crane capacity of 12,000 kg x 1.6 m (22 tm), the largest in its class. Wide outriggers coupled with increased capacity greatly improve the crane's lifting performance compared with previous models in the same class.

AML with Safety Eyes provides a greater degree of vision and control for the operator. It monitors overload momentum during work and warning/stops once momentum is reached 100%; it also reduces lifting capacity during low truck cargo load activity to avoid tipping over. The HRS models add a colour LCD radio remote controller that displays the lifted load, which allows changing of the operation position even when visibility is poor in the conventional operation position.

The MH model features more economic specifications, designed to appeal to a wider range of customers. These include 'Hook-In' and anti-two-block device functionality.

"We also equipped the TM-ZX1200HRS with a basket mode and a support mount for the basket at the tip of the boom, so that it can be used for aerial work," said Mr Nozawa. "The wider outrigger width also leads to a larger working radius in basket mode."

Somkieat Jiviriyawat, senior vice president of Tadano Italthai, added that the TM-ZX1205HRS was designed according to Tadano's core value that underpins 'safety, quality, efficiency' and highlighted its versatility.

LEFT AND BELOW LEFT: **The new Tadano TM-ZX1205HRS loader crane features a maximum lifting capacity of 12 t and maximum outrigger width of 5.5 m.**

BELOW: **AML with Safety Eyes provides a greater degree of vision and control for the operator. It monitors overload momentum during work and warning/stops once momentum is reached 100%.**

"The Tadano crane can be mounted on all large-size trucks and all models that carry Japanese, European, US, or Chinese brands. The lift height can be adjusted to fit the operating site, for example in buildings or tunnels," explained Mr Jiviriyawat. "It is also equipped with an alarm system when unsafe issues are spotted, to help reduce possible accidents. Meanwhile, the basket mode is added on, in line with safety standards."

According to Mr Nozawa, the TM (truck mounted) crane market in Thailand is currently considered the largest in ASEAN. "It is expected to keep expanding with supportive factors, economically and geographically. Plus, we believe 'safety' would be the key factor in ASEAN. We believe the TM-ZX1205HRS will continuously raise demand for TM cranes."

New Tadano TM dealer

As a Tadano TM dealer in Thailand, Saha Crane Auction "would be the main partner under the market expansion and receive the opportunity for mega-investment projects for us," said Mr Nozawa.

Saha Crane Auction, which was created in 2011 as a subsidiary of Saha Crane Service Co Ltd, offers the latest amenities for customers looking to acquire cranes and other heavy machinery along with other materials for the construction industry.

The company's location in Rayong as well as neighbouring Chonbri – about 54 km from Bangkok – is close to numerous petrochemical plants and other industrial facilities, making the area promising for sales of HRS models equipped with state-of-the-art safety features.

Pramote Sanitwaja, CEO of Saha Crane Service, said, "The concept of 'TM Safety Eyes Era' was one of the greatest innovations in the TM crane industry. The [launch] event visually showed our customers how the crane operates.

"Distribution via Saha Crane Auction will provide customers with integrated solutions. This collaboration will synergise each party's strengths: Tadano's quality products and after-sales services and Saha Crane Auction's extensive expertise in heavy machinery leasing."

Mr Sanitwaja continued, "The customers will be aware of how TM crane can be easier to operate safely. This is a great opportunity for Saha Crane Auction; we will drive the TM crane industry in Thailand." ■

Website: www.tadano.com

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DPR Construction uses technology to build Curtin Singapore without meeting multiple stakeholders physically

DPR Construction was awarded the contract to fit out 5,000 sq m of existing space for Curtin Singapore. This is a Singapore-based campus for Australia's Curtin University.

The challenge for DPR was the project deadline, which was only 114 days away from completion. This was compounded by the fact that many project stakeholders were based nearly 2,500 miles away in Australia. Therefore, keeping alignment among project partners was a key challenge to the schedule.

"For this project, time and information sharing were key challenges," said Richard Kimber, DPR's managing director for Singapore and Southeast Asia. "We also faced supply chain issues. Managing any issues that came up with providing progress reports in a timely way was vital to the completion of the project."

The challenge for DPR was the project deadline, which was only 114 days away from completion. Plus, many project stakeholders were based in Australia.

Matterport in action

The solution to the project by DPR was using a tool at hand in a new way: the use of Matterport to capture immersive 3D models of the space in real-time as the project progressed.

"Matterport is a tool we have used in a variety of applications for 3D modelling as part of our virtual design and construction efforts," said Sean Hillier, who led the DPR's project team. "It was designed to do that and we thought maybe this can be applied to solve our communication challenge."

According to DPR, the team provided 3D scans of the space as weekly visual updates to keep remote customer stakeholders informed on progress throughout the project. Stakeholders from the school as well as from Navitas – a leading global education provider – could virtually walk the spaces with DPR's team nearly in real-time, as opposed to a 1-2 day lag time with a more traditional approach. This also means faster discussion of design and/or operational challenges arising from Covid-19, such as incorporation of systems to support hybrid teaching platforms.

The learning lab at the campus. DPR's team worked close to 70,000 worker hours over the course of the project without incident.

Mr Hillier added, "The scans allowed the clients' remote stakeholders, many of whom are unable to visualise layouts from design plans, to view controllable walkthroughs and provide spatial awareness, in order to better understand and implement the project if needed. This also enabled operational and construction changes within the earliest possible timeframe."

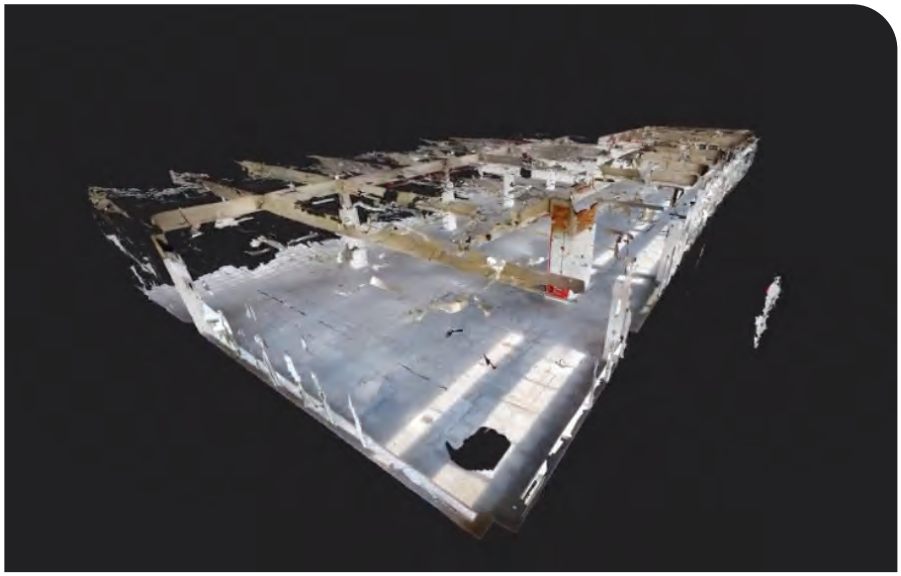
DPR said the client felt much more informed about how the project was progressing and was able to bring even more stakeholders to the table to have input that would be normally feasible. This is especially notable, DPR pointed out, as virtual design and construction (VDC) tools are not yet widely adopted in Singapore, especially for interior projects.

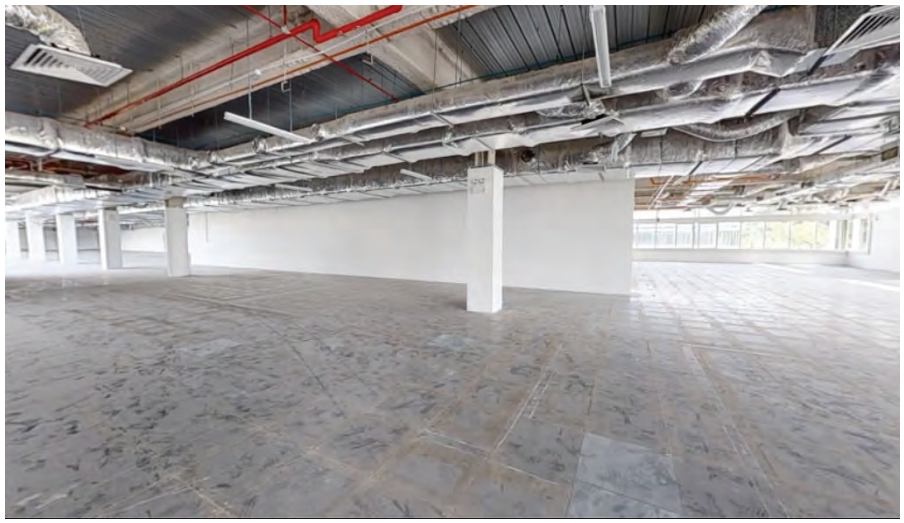
Mr Kimber commented, "We are pleased that the project was completed on schedule and under budget. The creative use of VDC tools is instrumental in any construction project type and this project has proven it."

DPR's scope of work for this project included advanced mechanical and structural works (internal stairs and slab opening), partition, ceiling and floors, floor finishes, joinery, loose furniture signage, AV and teaching aid technology, and associated MEP works. All of it will support a new space spread across three floors in an existing building that includes classrooms, office space, a seminar room, a library, collaboration spaces, IT labs and nursing labs.

DPR further revealed that the team worked close to 70,000 worker hours over the course of the project without incident. ■

Website: www.dpr.com





TOP AND ABOVE: **DPR used Matterport to capture immersive 3D models of the space in real-time as the project progressed. With the 3D scans, remote stakeholders could virtually walk the spaces with DPR's team nearly in real-time, as opposed to a 1-2 day lag time with a more traditional approach. These two images are screenshots from DPR video showing a 3D scan of the space.**

The solution to the project by DPR was using a tool at hand in a new way: the use of Matterport to capture immersive 3D models of the space in real-time as the project progressed.

The nursing lab at the campus. With the creative use of VDC tools, the project was completed on schedule and under budget.

Meninting Dam

PT Hutama Karya implements digital solutions to build one of key national projects in Indonesia

The Meninting Dam is currently under construction. To carry out the work safely, PT Hutama Karya decided to revolutionise its surveying and data collection by fully digitising the processes. Bentley's digital tools have also been used in this project.

The island of Lombok in Indonesia is increasingly known as a popular tourist attraction and thus offers a promising avenue for the country's economic development. To provide balance in water availability between rainy and dry seasons, Indonesia's Directorate of General Water commissioned PT Hutama Karya (Persero), a state-owned enterprise that executes infrastructure projects, to engineer a dam in the West Lombok Regency. This district stretches along most of the southwestern coast of the island.

The Indonesian Government has deemed the Meninting Dam necessary for the development of the country's infrastructure and economy, officially naming it a National Strategic Project for the Acceleration of Economic Growth in Indonesia.

"It will significantly support the agricultural sector of the locals, and also support economic growth by making a new destination for the tourism sector," said Christy Vania, an engineer at PT Hutama Karya who is focused on building information modelling (BIM).

Improving safety

Work on the US$95.15 million Meninting Dam began in 2019 and is expected to last into 2023. When completed, the dam will be 79 m high with a water capacity of 12 mil cu m. It will irrigate more than 1,500 ha of agricultural property and ensure the availability of clean water to nearby Lombok residents and tourists. Moreover, the dam will provide an additional 0.8 MW of clean, hydroelectric power to the community.

However, to achieve this vision, PT Hutama Karya had to navigate tricky terrain. Parts of the site chosen for the dam were difficult to access, with thick trees and shrubbery and steep conditions. The undeveloped site presented an unknown degree of hazards for surveyors and construction workers. When the team attempted to survey the property using traditional methods, the data collection process was drawn-out and dangerous.

Considering these challenges, PT Hutama Karya decided to revolutionise its surveying and data collection by fully digitising the processes. The team used a drone with a flying distance of 7 to 8 km to capture images and data from the site's hardest-to-reach areas. The drone's findings were then processed using Bentley's 3D reality modelling and real-time visualisation software to chart maps and monitor ongoing conditions at the site, identifying any new potential work hazards over time.

This methodology cut the time required for data collection and monitoring by half and contributed significantly to worker safety. In total, project engineers saved an estimated US$2.1 million in fees by avoiding potential work-related accidents.

"Because the terrain is very steep, there is a high potential for landslides. But we can say we had around 1,200,000 safe resource hours without lost time or injury," said Ms Vania.

For the construction phase of the project, these digital visualisation tools were folded into PT Hutama Karya's GIS dashboard, which also integrated BIM capabilities. Post-construction, these tools will also be useful so that Indonesia's Directorate of General Water Resources can monitor the dam's performance and upkeep.

Ms Vania believes that the safety and cost benefits evident from PT Hutama Karya's innovations on the Meninting Dam will undoubtedly be carried forward into the company's future projects, and digital surveyance will become a best practice.

Maintaining sustainability

Another one of PT Hutama Karya's priorities for the Meninting Dam was to keep the project's development as sustainable as possible. For instance, during construction, the company took steps to reduce the impact of tree cutting. Where trees had to be removed in the dense forest area, steps were taken to use displaced soil in another area of the project. That soil was also used to plant new trees.

Furthermore, PT Hutama Karya's venture into digital project management helped to keep sustainability front and centre. In a region where clean water is already precious, it was important to ensure that construction activities did not result in further contamination of the Meninting watershed.

Through digital monitoring, project managers noticed that river water around the dam's construction was becoming dirty with excavated soil and heaps, creating a potential environmental risk for people who live within a 3-km radius of the dam. Project managers were then able to reduce the pollution and avoid creating ill effects for the civilians they hoped to serve with this key infrastructure project.

Ambitious national goals

In 2016, Indonesia implemented a sweeping plan to progress national development through key infrastructure projects. The nation's government convened the new Committee for Acceleration of Priority Infrastructure Delivery, which identified around 245 urgent projects, including new roads, dams, airports, power plants, and irrigation networks.

PT Hutama Karya used a drone with a flying distance of 7 to 8 km to capture images and data from the site's hardest-to-reach areas. The drone's findings were then processed using Bentley's 3D reality modelling and real-time visualisation software to chart maps and monitor ongoing conditions at the site, identifying any new potential work hazards over time.

These strategic projects will not be completed overnight. However, work has already advanced on several high-priority projects in which PT Hutama Karya is involved.

Ms Vania has been responsible for overseeing streamlined BIM implementation from the project level to the corporate level, including major efforts such as the Trans Sumatera Toll Road and the ongoing Meninting Dam project.

"We [implement] best practices for the projects we manage, but also, we keep looking for something new to develop in BIM technology," she said.

One of the individual project managers who has worked together with Ms Vania is Fariz Harwanto, the current site engineering manager for the Meninting Dam.

"I'm very interested in how the dam will help the local community in farming, with water, and as a tourism area," said Mr Harwanto, as he looks forward to seeing the completed Meninting Dam improve everyday life for people in the area.

As Indonesia is gaining momentum to address so many key infrastructure issues, both Ms Vania and Mr Harwanto agree that it is a prime moment to be an engineer in the country.

Mr Harwanto is excited to welcome budding young engineers to the field. "I would tell them to prepare to learn," he shared his advice. "[It takes] problem solving. How can we get to work when the land acquisition has not been completed? How do you make our method work with current conditions?"

With so many experts needed to move Indonesia's strategic development forward, Ms Vania noted that opportunities are opening for people who may have been shut out of the engineering field in the past and in fact, the field needs new voices more than ever as it strives to meet ambitious national goals. "For women, the engineering field is very open today," she asserted. ■

Website: www.bentley.com / www.hutamakarya.com

Tseung Kwan O (TKO) is the seventh new town in Hong Kong and the newly opened bridges will improve the district's accessibility and cater to increased transport demand.

Tseung Kwan O – Lam Tin Tunnel

A new link between Tseung Kwan O and East Kowloon, Hong Kong

Developed in the 1980s, Tseung Kwan O (TKO) is the seventh new town in Hong Kong that is home to a population of 414,000. To improve the district's accessibility and to cope with the continuing increase in transport demand between TKO and East Kowloon, the Hong Kong Government worked on the Tseung Kwan O – Lam Tin Tunnel (TKO-LTT) as an additional and alternative highway route.

TKO-LTT is a dual two-lane highway featuring approximately 3.8 km long. It incorporates several bridges and a 2.2-km main tunnel. Construction work commenced in 2016 and TKO-LTT was opened to the public in December 2022.

Aurecon played a major role in the project, helping to build the TKO interchange and TKO-LTT main tunnel. In this article, the team shares the challenges involved and the innovative solutions applied in order to carry out the job successfully.

Aurecon was commissioned to deliver structural, geotechnical and temporary design works for the bridge component of the TKO Interchange and Associated Works project.

This new elevated interchange over the sea, which consists of seven post-tensioned concrete bridges, was erected using the precast segmental balanced cantilever method.

Challenging bridge

Aurecon was commissioned by Chun Wo – Shanghai Tunnel – China Metallurgical Joint Venture (CW-STEC-CMGC-JV) to deliver structural, geotechnical and temporary design works for the bridge component of the TKO Interchange and Associated Works contract. The job was completed in 2019.

This new elevated interchange over the sea, which consists of seven post-tensioned concrete bridges, was erected using the precast segmental balanced cantilever method. The bridges also form a part of Route 6 – a major new link between the New Territories and Kowloon.

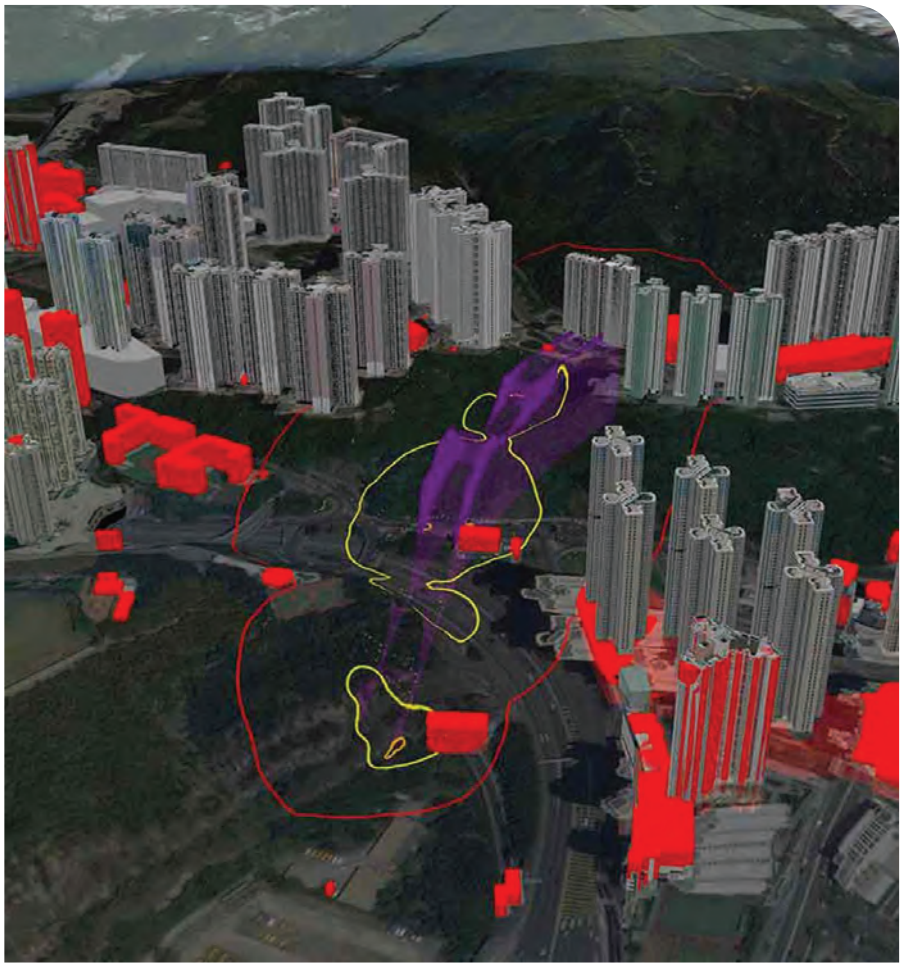
Designing and constructing these seven bridges over the marine zone that pose aggressive environmental conditions were quite a challenge, revealed Aurecon. Some of the complexities included: heavy wave actions, onshore wind and water seepage; highly curved road geometry alignments; precast segmental single box deck; balanced cantilever construction method; and narrow deck with complex structural details.

Aurecon stressed that accurate assessments of exposure severity were vital to determine appropriate approaches with sufficient durability. Based on the requirement, the bridges must be designed and built for a design life of 120 years. To ensure the structure is resilient to the extreme natural events, the piles for the bridges were founded in competent rock with some pile lengths exceeding 50 m.

With the bridges constructed over the sea, the geological longitudinal section of the rock goes as deep as 50 m below sea level requiring longer piles, while the bridge piers have piles cantilevering reaching to 20 m from the seabed. Aurecon selected the method of erection, ensuring the geometry of the bridge superstructures met the required tolerances.

Geometry control work comprised the development of segment casting geometry, provision of segment data for individual segment match casting work at the precast yard, and on-site erection geometry control work during segment erection. In addition, Aurecon worked closely with the contractor to avoid step joints between the T-spans.

The bridges have extreme tight curvature with radii as low as 44 m, added Aurecon. The geometric behaviour of the bridges are more complicated than straight bridges with inherent challenges. To address this, the project team avoided using external post-tensioning but adopted internal tendons. This approach saved the



Aurecon utilised the GIS platform to map out the location of the buildings that might get affected by the drill and blast work during tunnel excavation.

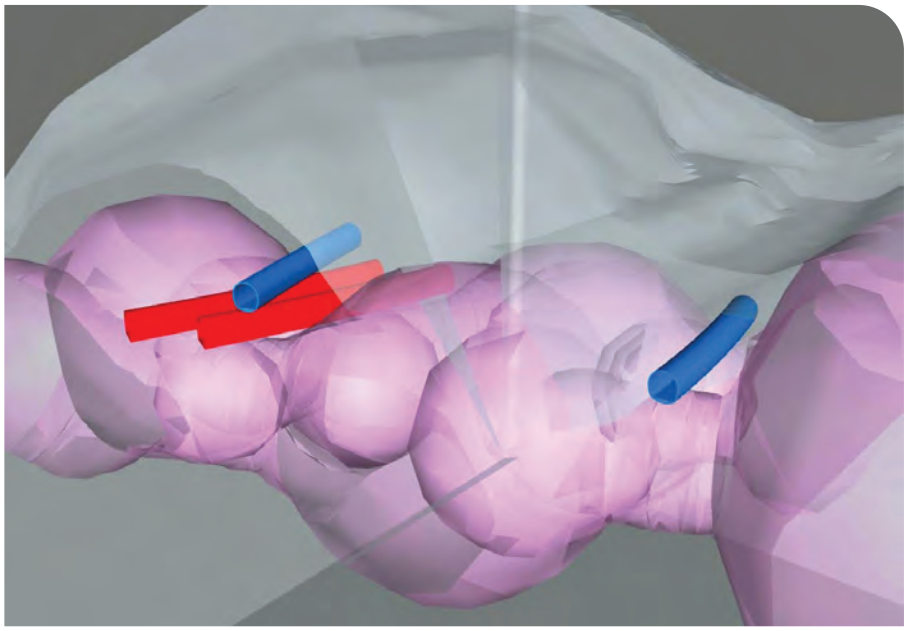
The bridges have extreme tight curvature with radii as low as 44 m. The geometric behaviour of the bridges are more complicated than straight bridges with inherent challenges. To address this, the project team avoided using external post-tensioning but adopted internal tendons. This approach saved the cost of erecting closely spaced deviators and resulted in better constructability.

cost of erecting closely spaced deviators and resulted in better constructability.

Another challenge for Aurecon was to successfully construct the precast segmental bridges in the marine zone with minimal disturbance to the natural environment while providing design solutions for the works to be carried out safely.

Aurecon strived to integrate safety in both the design and construction phases to ensure that workers were protected against any unnecessary exposure of potentially unsafe matters. This initiative also helps to reduce the amount of future maintenance works by enhancing the durability of the permanent works. Measures taken included:

- Adopting precast shells to enhance work safety and reduce disturbance to the environment.
- Fulfilling the crack width limits on the pile cap shell to enhance durability; this helps reduce long-term repair work and maintenance requirement at sea.
- Utilising modularisation to minimise manual works in the sea.
- Adopting a simpler method of shell installation and integration with permanent works.
- Deploying Aurecon's in-house digital experts and developed 3D geometrical models for plate element analysis for clash detection and better determinations of design actions.



With the GIS solution, Aurecon was able to efficiently complete extensive calculations and 3D contours for drafting.

The power of GIS

Aurecon was also engaged by Leighton and China State JV to provide contractor's design such as TKO portal caverns and connection to Eastern Harbour Crossing under Lei Yue Mun Road for the TKO-LTT – Main Tunnel and Associated Works contract. The job was completed in 2022.

The main tunnel and a significant amount of surface works were excavated using the drill and blast method. With a geology of mostly hard granite, this approach was deemed the most effective.

As the drill and blast excavation for the tunnel would navigate through a densely populated area, Aurecon pointed out that it was critical for the operation's effects on the environment and Hong Kong citizens to be thoroughly assessed and minimised.

There were two main environmental considerations for the drill and blast excavation: vibration (transmitted through the rock, measured as peak particle velocity), and air overpressure (the shockwave of audible and inaudible 'noise' generated at a blast).

According to Aurecon, the use of a geographic information system (GIS) for the project's blast assessments avoided the need to manually engineer vibration contours and produced accurate 3D visualisations of blast plumes.

At the beginning of the project, the drill and blast calculations were being managed in Excel spreadsheets and the vibration contours were manually generated by CAD drafters, explained Aurecon.

Upon learning of this manual process, the company's Auckland-based GIS team knew that a spatial solution would bring better results. So it chose a GIS platform which primarily managed large quantities of geological and engineering data within a single database, while efficiently completing extensive calculations and outputting two dimensional (2D) contours for drafting.

To design a suitable GIS platform for the TKO-LTT – Main Tunnels and Associated Works, a collaboration between Aurecon's Auckland and Hong Kong teams was required, leading to a platform that was more efficient and much easier to use.

Besides presenting clients with clearer data quicker and more accurately, while the GIS platform was in development, there were other potential benefits of the application such as stakeholder and community consultation.

"Modern-day drill and blast is nothing like the evoked vision of workers hammering away in tunnels with chisels, mechanically tapping holes and filling them with unpredictable dynamite," said Aurecon. "Some stakeholders and communities are not familiar with the new methods of excavation by drill and blast, and are rightfully protective of their assets as there are thousands of historic buildings in Hong Kong.

"Thus, the 3D visualisations produced from the data in GIS may help to educate stakeholders about the drill and blast process and alleviate concerns over the project." ■

The main tunnel and a significant amount of surface works were excavated using the drill and blast method. With a geology of mostly hard granite, this approach was deemed the most effective.

Website: www.aurecongroup.com

Cat 350 excavator

Featuring a powerful digging force and strong swing torque, the new Cat 350 excavator can be equipped with large buckets up to 3.2 cu m for excellent productivity. While productive, this model consumes up to 13% less fuel than the Cat 349 to lower costs, reduce CO2 emissions, and operate more sustainably. Three power mode options – Smart, Power, and Eco – match the machine to the job to further reduce fuel consumption.

"Caterpillar is committed to reducing greenhouse gas emissions, while helping our customers meet their climate-related objectives," said Brian Abbott, Caterpillar global product manager for large hydraulic excavators. "The 350 is our latest example of delivering on that commitment."

The new 350 excavator's standard Cat 2D Grade system indicates depth and slope on the monitor with alerts to increase operating efficiency. Grade Assist helps the operator to effortlessly stay on grade with single-lever digging. For truck loading and trenching applications, Swing Assist automatically stops excavator swing at operator-defined setpoints to consume less fuel.

Lift Assist helps to avoid machine tipping by letting the operator know the load is within safe working range limits. To safely work around obstructions, 2D E-Fence prevents the excavator from moving outside of operator-defined set points.

Cat Payload onboard weighing gives real-time weight estimates to achieve precise load targets and improve efficiency. When

combined with VisionLink, Payload offers remote managing of production targets. Alternatively, the monitor's USB port allows fleet managers to download up to 30 days of work for progress management without an internet connection or VisionLink subscription.

Available in-cab grade technology upgrades include: Cat Grade with Advanced 2D for creating and editing grade designs via a second high-resolution touchscreen monitor, and Cat Grade with 3D to create and edit designs on that second monitor plus see the front linkage's full range of motion. All Cat Grade systems are compatible with radios and base stations from top third-party technology suppliers.

The Cat C9.3B engine has more than 14 million hours of service to attest to its long-term reliability. Synchronised 1,000-hour oil and fuel filter service intervals reduce downtime. The hydraulic oil filter offers a 3,000-hour replacement interval – an increase of 50% over the previous design – and provides improved filtration performance.

ABOVE AND ABOVE RIGHT: **The new Cat 350 excavator can be equipped with large buckets up to 3.2 cu m for excellent productivity. The machine offers a powerful digging force and strong swing torque.**

RIGHT: **The deluxe cab features automatic climate control, a tilt-up left seat console for easy entry and exit, and a heated seat.**

The 350 excavator consumes up to 13% less fuel than the Cat 349 to lower costs, reduce CO2 emissions, and operate more sustainably. Three power mode options – Smart, Power, and Eco – match the machine to the job to further reduce fuel consumption.

The Cat 350 can work at up to 4,500 m above sea level. It features standard high-ambient temperature capability of 52˚C, cold-start capability at -18˚C with optional cold-start capability at -32 C. Automatic hydraulic warm-up in cold temperatures gets the machine to work faster and prolongs the life of machine components. A double element air intake filter with pre-cleaner features high dust capacity, and the machine's high-efficiency hydraulic fan offers an automatic reverse to keep cores free from debris.

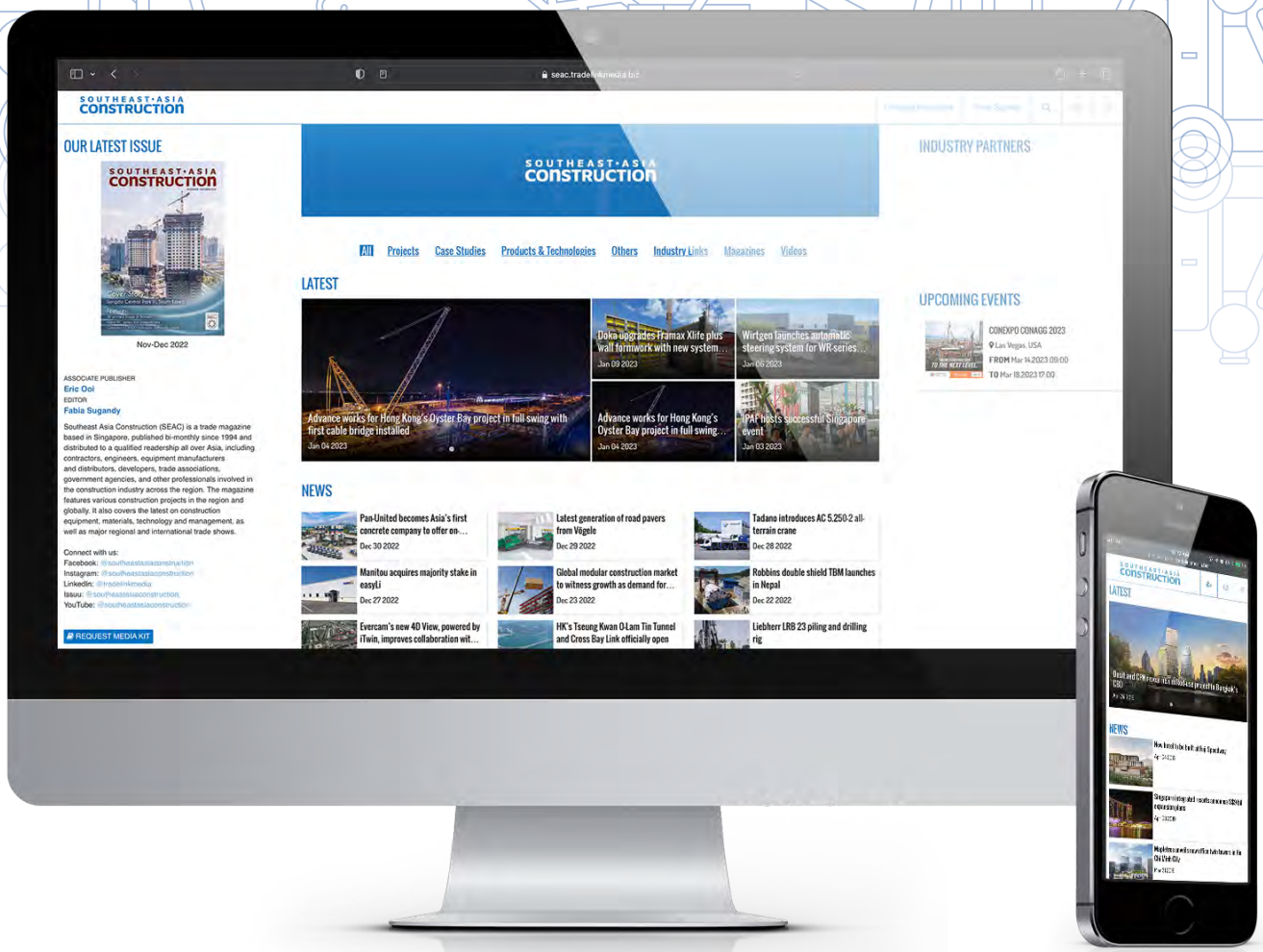
Product Link collects data automatically and gives fleet manager critical operating information like location, hours, fuel usage, idle time, maintenance alerts, diagnostic codes, and machine health online through web and mobile applications. Maximising machine uptime, remote troubleshoot and remote flash allow dealers to remotely connect with the machine to diagnose fault codes and update operating software. Operators can easily track filter life and maintenance intervals through the touchscreen monitor.

The 350 excavator features easy keyless starting via a push button, Operator ID passcode, or Bluetooth key fob. Operators can programme each joystick button to preference – including power mode, response, and pattern – using the unique Operator ID, and the machine will recall individual preferences based on the ID. Its large, high-resolution touchscreen monitor with jog dial offers quick navigation through machine controls and provides quick access to the machine's digital operator's manual.

When cutting through tough material, standard auto dig boost delivers an automatic 8% power increase for better bucket penetration, shorter cycle times, and greater payloads. Auto heavy lift offers an 8% increase in lifting power when needed for as long as needed. At the touch of a button, operators can switch to the optional Cat Stick Steer for simple one-hand operation of travel and turning. Preventing wear and tear on the excavator and attachment, standard auto hammer stop warns operators after 15 seconds of continuous firing and then shuts off the hammer after 30 seconds.

The deluxe cab features automatic climate control, a tilt-up left seat console for easy entry and exit, and a heated seat. With all controls ergonomically positioned in front of the operator, the layout helps to reduce fatigue and straining movements. Large cab windows, along with a lower front, right, and rear machine profile, offer outstanding visibility of the work area without straining. ■

Website: www.cat.com



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Link-Belt 300|AT all-terrain crane

The new Link-Belt 300|AT all-terrain crane is equipped with a seven-section, 13-72.5 m pin and latch greaseless formed boom. This 250-t (300-USt) model has an optional, two-piece 12.8-21.6 m on-board hydraulically offset fly and two 7.6-m lattice extensions. Maximum attachment can achieve a tip height of 112 m and an efficient modular counterweight configuration adds to the crane's versatility.

"We spoke extensively with our customer base and feel like we have delivered. They want a crane that travels down the road efficiently, goes together on a jobsite quickly, has a strong chart and is reliable," said Andrew Soper, product manager for telescopic truck and all-terrain cranes at Link-Belt.

"This crane represents Link-Belt's long-term AT investment, which goes back to 2009 with construction of our own formed boom bay and subsequent ATC-3275 introduction."

The 300|AT's maximum counterweight is 73,481 kg with four overflow truckloads. To improve mobility and efficiency for a variety of jobsite scenarios, the crane can be set up with two overflow loads and 33,565 kg of counterweight.

Another improvement to the 300|AT's mobility is the option of transporting the crane with its upper 3,628 kg counterweight tray and still stay below 72,574 kg gross vehicle weight (10,432 kg per axle).

The 2.4-m heavy lift fly provides robust capacities and line separation for two-load line operation in applications like precast wall panels. Notable features such as greaseless sheaves and Teflon wear pads cut maintenance and service costs. Additional standard boom features include wireless wind speed indicator, single-hand operation rope guard, and three work lights on the boom base section.

Furthermore, the 300|AT will feature SmartFly. This simple, intuitive SmartFly system ensures proper fly erection and stowage

ABOVE AND RIGHT: **The new 300|AT all-terrain crane has a seven-section, 13-72.5 m pin and latch greaseless formed boom. Maximum attachment can achieve a tip height of 112 m and an efficient modular counterweight configuration adds to the crane's versatility.**

sequence while minimising work at height. The Link-Belt fly erection procedures have been embraced in the market on most all of the company's telescopic product line for their ease of assembly and one-person operation.

A single, 554-hp Cummins X15 diesel engine with ZF Traxon automated manual transmission powers the new 300|AT. The transmission features improved shifting performance and offers integrated intarder braking with paddle shift controls for easy stop-and-go at highway speeds.

The 300|AT also has a new power transmission system for efficiently powering upper hydraulic functions. It offers a 24-V electrical system with an optimised, modern CAN Bus communications.

Customers will recognise the purpose-built two-person carrier cab from the 175|AT on the new 300|AT. The interior features amenities such as automatic climate control, blue tooth radio, cell phone charging and LED lighting. An air ride seat with lumbar support provides optimum comfort while driving.

The operator's cab is tailored for all-terrain operations. Pulse 2.0 with its 25.4-cm touch display is at the heart of the new 300|AT with functions and controls that are intuitive, adaptable and in easy arm's reach. The view from the seat is unimpeded in any kind of weather with large sweeping wipers in the front and top, and strategically-placed vents for quick defrost.

Another new feature to Link-Belt's all-terrain lineup is the improved flexibility of V-CALC, an infinitely variable outrigger positioning that allows for setup in tight jobsite conditions where outriggers require being unevenly extended (0%, 40%, 70% and 100% extension). All capacities are printed in crane rating manual and automatic swing function kick-out works to maintain forward and backward stability.

Standard carrier features that operators are accustomed to include: four points of access to the flat carrier deck, a comprehensive camera 'Site Vision' package, and the premiere lighting package on the market for night-time operations. ■

Website: www.linkbelt.com

RIGHT AND BELOW: **The 300|AT's maximum counterweight is 73,481 kg with four overflow truckloads. To improve mobility and efficiency for a variety of jobsite scenarios, the crane can be set up with two overflow loads and 33,565 kg of counterweight.**

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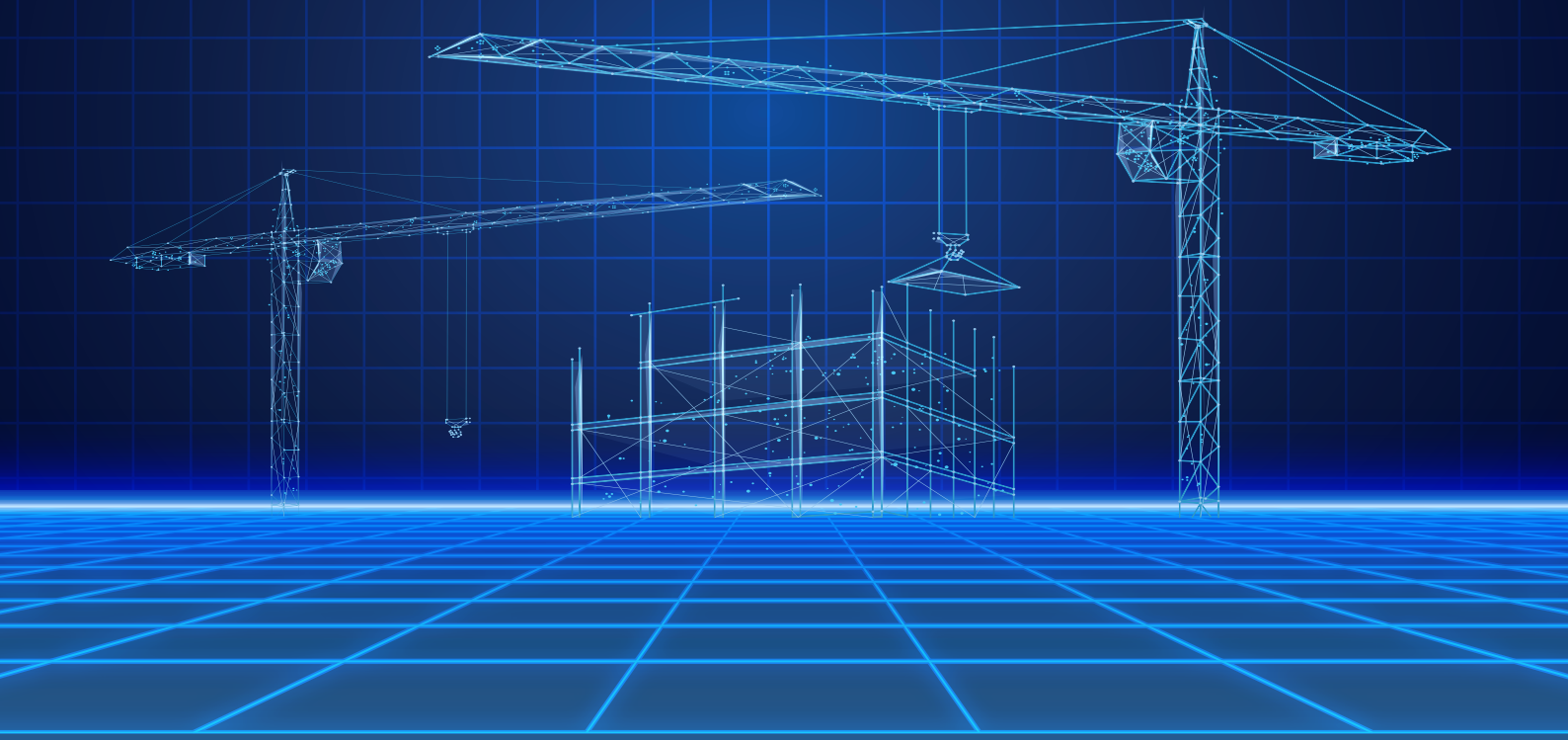

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PARIS UNDERGROUND

In preparation for the 2024 Paris Olympic Games, and construction of the Olympic and Paralympic Village in particular, work is ongoing in Paris and its outskirts to run powerlines underground and free up more than 80 ha of land. In fact, by 2024, the local provider RTE (Réseau de Transport d'Électricité) is planning to put four 225-kV powerlines underground, which are going to substitute 15 km of cables running on 27 pylons and pass through the towns of Saint-Denis, Villeneuve-la-Garenne and L'Île-Saint-Denis, close to the French capital.

This work is part of the Mesil (Mise en Souterrain d'Initiative Locale) project – the first of its kind in France – and will involve boring out deep tunnels in a highly built-up area where numerous road, rail and river infrastructures are located. It is being carried out on extremely important powerlines that feed the Gare du Nord railway station, Line 13 of the Paris Metro and the entire area to the north-west of the city (with a population of more than 800,000).

There are other sites currently ongoing in the same area, so the work needs to be very carefully coordinated, and also takes into account the future reorganisation of the urban layout with 2 km of tunnels at a depth of 50 m.

To overcome the challenges of this part of the project, RTE opted for the construction of an underground tunnel through which the new powerlines will pass. This is a fitting solution for such a congested and densely populated area.

Situated at a depth of 50 m, the tunnel is approximately 2.5 km long and 3 m in diameter. For the tunnelling work, which deploys a 120-m-long, 3.9-m-diameter TBM called Ambra, a total of 120,000 liner segments had to be installed.

Backfill grouts with Mapei systems

While tunnelling, a TBM leaves an annular void between the ground and the extrados of the segments when they are placed in position and this void has to be filled as the TBM advances. Depending on particular site constraints and decisions taken by the main contractor, the voids may be filled with grouts or two-component grout, in which component A is made from water, bentonite, cement and a set retardant and component B is a set accelerator.

Mapei was involved in the project from 2021 to 2022, supplying its products for injections and TBM works. The company's two-component system, thought to be the most suitable for this site by the main contractor Spie batignolles, had already been used on other sites such as Lots T2A and T2B of the 15 Line South of the Gran Paris Express project, the extension of the safety tunnel for the RER C in Meudon and site SMP4 for the Tunnel Euroalpin Lyon Turin (TELT).

OPPOSITE AND ABOVE: **Excavating the tunnel with a 120-m-long TBM called Ambra. The work required a total of 120,000 liner segments to be installed. When completed, the new tunnel will be used to run powerlines underground.**

Because of the constraints imposed by the mechanical properties required, along with the high pressures due to the sheer depth of the tunnel, a preliminary study had to be conducted in the Mapei laboratories. The products provided by the company include:

• Mapequick CBS System 3 – a liquid product used as accelerator of cement-based mixes for injection, ideal for extremely fluid mixes with a very high content of water.

• Mapequick CBS System 1 – a liquid retarding agent with plasticising effect which inhibits the setting times of cementitious mixes for long periods. It is specifically designed for cementitious mixes that need long workability times, for example, because of long transportation times or long pumping distance.

• Mapebent API 2 – a natural sodium bentonite suitable for all types of civil engineering applications. It conforms to the international API specifications about materials to be used for drilling fluids and bentonite-based slurries and can be used in every civil engineering application, especially where a quick activation of bentonite in water is required and where the mix should have an easy pumpability and high volumetric stability. ■

Website: www.mapei.com.sg

Article courtesy of Realta Mapei International 95

TOP: **Mapei was engaged to supply its products for injections and TBM works. The company's two-component system is considered the most suitable for this site.**
ABOVE: **At a depth of 50 m, the tunnel is approximately 2.5 km long and 3 m in diameter. The entrance to the tunnel can be seen here.**

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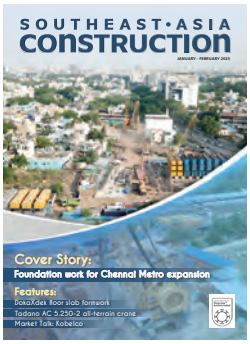

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