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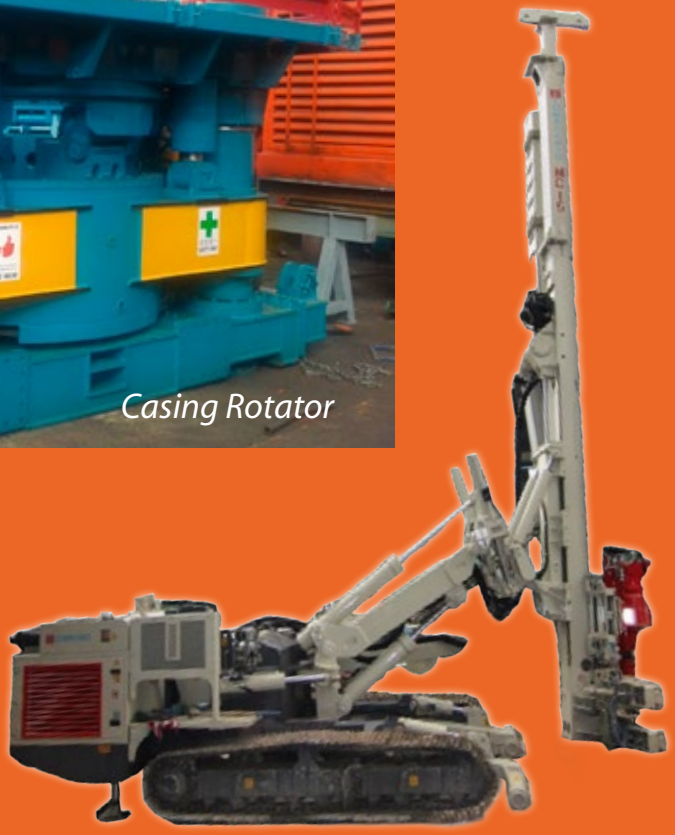

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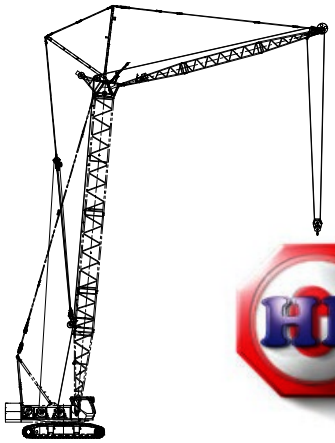

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The Scene: Indonesia's first movie themed holiday resort

Infinite Studios, an integrated media entertainment and creative services company, in partnership with Landstar Development, plans to bring movies to life with the launch of The Scene - a liveable and filmable movie town themed holiday resort located in the upscale Nongsa coastal area in Batam, Indonesia.

The development is inspired by classic European architecture by architect Piter Gan and Hollywood scenic artist Peter Collias. It spans 31,600 sq m featuring 295 low-rise condotel units of studios, one/two bedroom apartments and suites as well as 50 retail spaces. The resort will showcase top-of-the-range facilities including a lobby lounge, all-day dining, alfresco cafe and dining, rooftop bar, pool bar, clock tower gallery, wedding chapel, fitness and wellness centre, shopping streets as well as MICE rooms.

Construction of The Scene is planned in four phases and expected to be completed by December 2018. Phase 1 was launched in November 2014 comprising 109 units including studios, one-bedroom apartments and retail spaces.

"The Scene's unique concept stems from the strong demand we are seeing in Asia for movie production, with more international directors now choosing to come to this region," said Mike Wiluan, CEO of Infinite Studios. "What you see on the big screen, we have created in reality with The Scene. Its breathtakingly stunning cinematic environment presents an exciting opportunity as a new vibrant place to stay. Its close proximity to Singapore, excellent transport links, and first-rate architecture and hotel facilities, make The Scene destined to become a new iconic landmark." The development is only a half-hour ferry ride from Singapore and connected to Nongsapura Ferry Terminal by a short footpath.

The Scene development is planned to be constructed in four phases and expected to be completed by December 2018.

"Batam is the fastest growing city in Indonesia and has become increasingly attractive to investors due to its pro-business Free Trade Zone," said Djaja Roeslim, chairman of Landstar Development. "We have been in Batam's property business for over 25 years and have witnessed the growth of its hotel industry, resulting in the city having the third highest tourist arrivals in Indonesia. The Scene is expected to further rejuvenate Batam's hospitality sector, by transforming the island into a vibrant and dynamic resort destination." ■

Black & Veatch opens hydropower centre of excellence in Singapore

Black & Veatch has established a hydropower centre of excellence in Singapore, as countries in the region look at new ways to harness the oldest and most established renewable energy source.

"A common misconception is that hydropower is limited to schemes that include large-scale dam development," said Charles Feild, Asia Pacific hydropower director, Black & Veatch, who is based in Singapore. "Governments and the investment community are exploring alternatives. Small and mid-scale run-of-river projects can be successfully developed with lower capital start-up costs and, by connecting remote areas to the grid, deliver additional socio-economic benefits for rural communities."

Mr Feild will lead the centre of excellence, which will target both EPC (engineering, procurement and construction) and professional services assignments in Southeast Asia, with the engineering undertaken mainly in Singapore and supported by resources in Black & Veatch's regional offices.

"The power of water remains untapped in many parts of the region. Extensive efforts and plans are underway in Indonesia, Malaysia, Myanmar and the Philippines to increase electric generating capacity, and hydropower will make-up a significant portion of the overall capacity increase in the years ahead," said Mr Feild.

"Singapore is regarded as the leading Asian infrastructure hub to develop, finance and implement projects in the region. Companies can leverage Singapore's strong talent availability, ease of financing and regional connectivity to address opportunities in segments such as renewable energy, water and transport. We warmly welcome Black & Veatch's decision to set up its hydropower centre of excellence in Singapore, which builds on the strengths of its existing water business here," said Goh Chee Kiong, executive director, Cities, Infrastructure & Industrial Solutions and Cleantech, Singapore Economic Development Board.

Black & Veatch has been providing services to the hydropower industry for more than 35 years. The company's experience ranges from small 10 kW systems, to run-of-river plants of less than 1 MW to large projects with capacity greater than 1,000 MW.

New MD for Southeast Asia water business

In addition, Black & Veatch has appointed William Yong (left) as managing director of its Southeast Asia water business. Building on its core water consultancy work with PUB, the national water agency of Singapore, the company will expand its design-build (or EPC) business targetting water projects in the region. Black & Veatch will also target new industrial and private sector clients, and bring global hydropower expertise through its new Singapore hydropower centre of excellence.

"Our focus is on developing talent and expanding our service offering to existing and new clients. We have deep relationships with the water industry in Singapore that extend back more than 90 years and a strong reputation with banks and insurance companies given the decades of successful EPC power generation projects in the region," said Mr Yong. "This is the right moment to expand and provide integrated and diversified services that will deliver a greater impact in improving people's lives throughout Southeast Asia." ■

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JPN Industrial Trading becomes Skyjack dealer for Singapore

JPN Industrial Trading Pte Ltd has been appointed as Skyjack's official dealer for Singapore. The company purchased a number of the manufacturer's scissor platforms – all used – and immediately boosted its rental fleet with them (the rental operation runs under the company name Genfor Lease Pte Ltd). A second large order of new scissor lift platforms – mainly for supply to local contractors – has been sold, while a further quantity has since been added to stock.

"Our aim with the Skyjack brand is to introduce a small number of models and steadily build up the business as interest develops," said Cindy Casey Lim, business development director of JPN Industrial Trading Pte Ltd. "Although we have some units in our own rental fleet, our role here as a Skyjack dealer is to focus on sales and support. We've been putting units into the fleets of contractors, shipbuilders, warehousing companies, property management firms and other industries."

JPN is currently distributing the Skyjack SJ III 3219, SJ III 4626 and SJ III 4632 with working heights of 7.6 m, 9.8 m and 11.6 m respectively – categories that have long been popular with users in Singapore.

"Although Skyjack is well known on the international stage, to people here it is still quite new, but we've had lots of interest in the brand from customers who are used to dealing with us and know the level of support they'll receive," said Ms Lim. "But as well as persuading companies to take a look at a new brand, we also have the challenge of selling new machines versus old. When companies are used to buying an older machine for less money, there's often work to be done to outline the higher levels of profit and improved productivity from a new machine, purely because they are not used to paying the higher initial purchase price."

To counter this mindset, Ms Lim and the team at JPN Trading came up with a two-step process to educate customers on the value of modern Skyjack equipment. First was to educate the team at JPN. To be sure the company could sell and support the machines correctly, it organised an intensive training programme for both the sales team and the service technicians. Skyjack sent one of its own technicians from the company headquarters in Guelph, Canada to handle service training, while Simon Cracknell, Skyjack's business development director for Asia, handled the sales training. Following the success of the initial training, Ms Lim said further sessions are planned for the future.

The second strategy implemented by JPN as part of its familiarisation campaign for Skyjack was to put some of the first machines it purchased into its own rental fleet, Genfor Lease. The units then went out on hire to major customers at the same price as older, less productive units, yet they were able to do much more. This gave customers a much better understanding of what they could achieve with modern access equipment.

"The Skyjacks are a fantastic product. They look – and they are – straightforward, being easy to maintain and service," boasted Ms Lim. "That's what really appeals to customers in Southeast Asia; they don't want anything too complex. But I also want to show my customers that there's a difference between a newer and an older machine. They're more durable and that means you can do more over a longer period of time. There is a long-term cost efficiency in having a newer rather than an older machine."

According to Ms Lim, promoting this message has been the single biggest challenge since JPN took on the Skyjack brand, but there are opportunities and rewards as interest continues to build. "Our business in Singapore continues to be good. We're still involved some way or another with most of the major projects here, and the enquiry and activity levels are still high. Plus, we have facilities and customers in Malaysia and Indonesia and we're already talking with them about the Skyjack product."

From left: Phillip Lim, managing director of JPN Industrial Trading Pte Ltd; and Cindy Casey Lim, business development director of JPN Industrial Trading Pte Ltd.

JPN is currently distributing the Skyjack SJ III 3219, SJ III 4626 and SJ III 4632 with working heights of 7.6 m, 9.8 m and 11.6 m respectively.

Established in 1988, JPN Industrial Trading is a well established business covering the sale, rental and re-conditioning of construction equipment. In Singapore the company operates from a large, 34,000 sq m facility in Pandan, with water-front access and its own barge for equipment deliveries to customers outside Singapore. JPN also has three Malaysian branches – Kuala Lumpur, Johor Bahru and Terrengganu – plus an Indonesian branch in Jakarta. ■

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Keppel Land expands office and commercial projects in SEA

Keppel Land plans to redevelop the existing International Financial Centre (IFC) Jakarta Tower 1 into a 49-storey state-of-the-art office tower that will more than double its net leasable area (NLA) to approximately 69,800 sq m of premium grade office space. The total cost to redevelop the building, excluding land cost, will be approximately Rp 2,504 billion.

Presently, construction of IFC Jakarta Tower 2, which will have a NLA of 50,200 sq m, is progressing on track for completion in the fourth quarter of 2015. It is the first project in Indonesia to be conferred the highest Green Mark Platinum Award by the Building and Construction Authority of Singapore (BCA). Keppel Land targets to attain the BCA Green Mark Platinum Award for the redeveloped IFC Jakarta Tower 1 as well.

Located along major thoroughfare Jalan Sudirman in Jakarta's financial district and within the golden triangle zone, the current 18-storey IFC Jakarta Tower 1 was completed in 1985 and is 100 percent owned by Keppel Land.

Demolition works is targeted to begin in the first quarter of 2016. Construction works for the new tower will follow and is scheduled to be completed in the fourth quarter of 2019.

Keppel Land is also strengthening its commercial portfolio in the Philippines by expanding the SM-KL project, its mixed-use development with Phase Two comprising a 42-storey office building and an extension of The Podium, an existing five-storey retail component in the Ortigas central business district (CBD).

The total construction cost for Phase Two is S$336 million. The project is jointly developed by Keppel Land, through Keppel Philippine Properties, and Banco de Oro (BDO), the banking arm of the SM Group.

To be completed in 2019, the new office tower will offer a NLA of over 89,000 sq m of premium grade office space and will be sited above the retail mall. The expansion of the retail mall will add over 34,000 sq m of retail space, bringing the total retail NLA to over 50,000 sq m when completed in 2016.

Phase One of the project comprises The Podium and an office tower which will house the operations of BDO. The office tower, also 42-storeys tall on top of The Podium, will offer about 70,000 sq m of NLA when completed in 2015.

In Vietnam, Keppel Land is progressing into the next phase of developing a 37-storey office tower in Saigon Centre Phase Two, its landmark mixed-use development in Ho Chi Minh City (HCMC).

Saigon Centre Phases One and Two are jointly owned by Keppel Land, Toshin Development Co Ltd and Vietnamese partners, Southern Waterborne and Transportation Corporation and Saigon Real Estate Corporation.

Standing at a total of 42-storeys, Saigon Centre Phase Two will comprise 40,000 sq m of premium Grade A office space, five levels of 50,000 sq m retail space and about 200 units of luxury serviced apartments. The total investment cost for Phase Two will be about US$255 million. ■

Volvo launches bi-lingual customer service call centre in Indonesia

Volvo Construction Equipment (Volvo CE) has launched a new call centre in Indonesia to handle customers' service and sales enquiries and liaise with dealers to action and resolve them quickly. The toll-free phone number can be accessed by customers from all over Indonesia and the customer service team speak both English and Indonesian.

"In our drive to improve the customer experience, we are delighted to offer customers this new service. We understand that construction equipment is a customer's tool for productivity, and machine downtime is perhaps the most anxious part of a customer's journey. We are now taking a proactive approach to managing and resolving customer concerns so they can get back to running their business more quickly than before," said Mark Gabel, managing director of PT Volvo Indonesia.

When customers contact the centre, their call is logged and routed to the relevant dealership for action – a process that has proved to address queries more successfully than previously. For technical assistance, a trained expert will call the customer back within two hours – while appointment bookings, sales enquiries and other information can be provided by the call centre team, over the phone.

The fully automated booking system tracks and monitors dealers' response times – and the data will be used to continually improve the service and maintenance process. ■

Volvo CE has a new customer call centre in Indonesia to handle service and sales enquiries.

Sany appoints new dealer in Indonesia

Xiang Wenbo (far left), president of Sany Heavy Industry Co Ltd and Thanakorn (far right), vice chairman of CP Group, witness the signing of the MoU by Xie Feng (left), CEO of Sany Asia-Pacific and Franciscus Affandy, vice chairman of CP Group Indonesia.

Sany Group and CP Group have signed a Memorandum of Understanding (MoU) to work together on the Indonesian market. Under the agreement, CP is appointed as a dealer for Sany Heavy Industry's earthmoving machinery including excavators and road machinery in Indonesia and some of its neighbouring countries. The signing ceremony took place during bauma China 2014 in Shanghai. ■

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Ammann launches new training centre in Australia

Ammann has opened a new training centre in Queensland, Australia. The company is believed to be the first plant manufacturer in the country to offer customers an opportunity to engage in efficient and local training measures.

"Our employees take care of all types and brands of asphalt mixing plants throughout Australia. They are always being approached by production employees and local managers seeking a solution for standardised operator training events," said Luke Fraser, service and installations manager at Ammann.

In keeping with its guiding principle of 'productivity partnership for a lifetime', Ammann has invested in providing local support to the Australian asphalt industry to offer urgently needed training measures and set new standards for all employees working in the asphalt industry. To this end, Ammann has combined its global resources and expert knowledge from its training centre in Langenthal, Switzerland, with the experience and knowledge of the local market. The training courses developed against this background are aimed at extending the operators' skills and knowledge on the asphalt production process. Both training centres worked closely together to create new interactive courses that cover the needs of beginners and advanced learners in several main areas. ■

Ammann has opened a new training centre in Queensland, Australia.

Tiong Woon signs major Grove deal

Tiong Woon Crane & Transport Pte Ltd has signed a major deal for five Grove GMK6300L all-terrain cranes. The machines have now been delivered to the company's Singapore headquarters.

With this latest order complete, there are now 18 Grove cranes in the Tiong Woon fleet, all of which have arrived in the past seven years. The company uses the cranes, including the new GMK6300L units, on a variety of industrial and construction projects for clients across the Southeast Asia region.

"Grove cranes are very popular units with our customers," said Ang Kah Hong, chairman of Tiong Woon. "When the Grove GMK6300L was launched in 2010 we could see that its onboard innovation gave it capabilities that other cranes didn't have, particularly with its 80 m boom. We watched the arrival of the first units in Asia with interest and quickly realised that this crane would be a great solution for many of our customers. It was only a matter of time until we ordered our own, and we saw such strong potential for the GMK6300L that we ordered five units."

The Grove GMK6300L is a six-axle, all-terrain crane and, in addition to its 300 t capacity and class-leading 80 m main boom, it also features Grove's unique Megatrak independent suspension, as well as all-wheel steer for easier navigation of job sites. ■

From left: Chian Ker Jeng, Manitowoc; Michael Ang, Tiong Woon Crane Pte Ltd; Eric Etchart, Manitowoc; Ang Kah Hong, Tiong Woon Crane Pte Ltd; and Raman Joshi, Manitowoc.

Mott MacDonald appoints Mike Barker as regional business development director

Mott MacDonald has appointed Mike Barker (left) as business development director for the Asia Pacific and Australasia regions.

Based in Mott MacDonald's Singapore office, Mr Barker will be responsible for strengthening the company's position in the sectors in which it currently operates as well as identifying new market streams.

Mr Barker is a structural engineer and has been with Mott MacDonald for over 25 years. He has worked around the world in Australia, south Asia, the Middle East and Europe and was most recently managing director of the Mott MacDonald's India business.

"I will be working closely with regional management teams to set out our business plan for the next five years. Mott MacDonald, through our expertise and the services we offer, is perfectly placed to win work on projects in the region. I will be looking at how we can maximise our current resources and winning work in new countries that are starting to develop. There are potential opportunities being offered in the Philippines, Cambodia and Myanmar where we can add value and deliver long lasting solutions to public and private clients to help realise their ambitions," said Mr Barker. ■

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AECOM to work on HK cavern sewage treatment works

AECOM has been appointed by the Drainage Services Department of the Hong Kong Special Administrative Region Government to provide investigation, design and construction supervision consultancy for the relocation of Sha Tin Sewage Treatment Works (STSTW) to caverns in Sha Tin, Hong Kong. The total contract value, including site supervision costs, amounts to US$130 million.

With a sewage treatment capacity of 340,000 cu m/day, the relocated STSTW is set to be the biggest cavern sewage treatment works in Asia when completed, serving a population of over 800,000 in Sha Tin. This project also marks a new milestone in large-scale cavern development in Hong Kong as part of enhancing land supply strategy to free up land for housing and other beneficial uses.

AECOM's scope of works includes engineering and environmental impact assessments, design of sewage treatment process, all aspects of engineering and architectural design in relation to the sewage treatment works in caverns, preparation of tender documents and construction supervision. AECOM will also assist the government in public engagement activities and provide preliminary design for the upstream sewerage networks and pumping facilities related to the relocation of the STSTW to caverns.

To design a sustainable sewage treatment works located inside caverns that will meet the demands for the next several decades, AECOM's cavern and process teams will work out advanced sewage- and sludge-treatment technologies to minimise the size of needed caverns, energy consumption, carbon footprint and sludge production, in order to optimise the cost of the entire life cycle. AECOM will organise pilot studies to ensure that state-of-the-art technologies work well for local sewage characteristics, including high salinity due to the use of seawater for flushing in Hong Kong.

"AECOM is delighted to deliver this mega-infrastructure project after the completion of our feasibility study," said Sean Chiao, AECOM's president, Asia Pacific. "With our integrated capabilities and technical expertise, we provide a truly integrated service to handle this challenging project that will generate tangible benefits for the Hong Kong society."

The investigation and design work are scheduled for completion in phases from 2017, and construction works will commence afterwards. ■

AECOM will provide investigation, design and construction supervision consultancy for the relocation of Sha Tin Sewage Treatment Works (STSTW) to caverns in Sha Tin, Hong Kong.

Volvo CE transfers backhoe loaders and motor graders to SDLG

Volvo Construction Equipment (Volvo CE) will discontinue the production of its backhoe loaders and motor graders in Europe and Americas and transfer these operations to its Chinese company SDLG. Combined with other efficiency enhancement measures, this move is expected to result in a workforce reduction of about 1,000 employees, of whom the majority are in Poland, the US and Brazil.

According to Volvo CE, the current product lines of technologically advanced and high-spec Volvo-branded backhoe loaders and motor graders have addressed a relatively small premium segment of the market. SDLG-branded backhoe loaders and motor graders will better serve customer demands in the large and growing value segment of the market.

Currently, motor graders are built at Volvo CE's production sites in Shippensburg, the US, and Pederneiras, Brazil; while backhoe loaders are manufactured in Pederneiras, Brazil, and Wroclaw, Poland. Ceasing European production of backhoe loaders will lead to the closure of Volvo CE's operations in Wroclaw.

The measures within Volvo CE are a part of the series of new activities within the increased scope of the Volvo Group's Strategic Program 2013-2015, which was published in conjunction with the report on the third quarter 2014. Combined, these activities are expected to reduce the Group's structural costs by SEK 3.5 billion. Together with ongoing activities, the ambition in the Strategic Program is to reduce the Group's structural costs by SEK 10 billion compared to 2012 and that all activities are implemented by the end of 2015 with a full-year savings-effect in 2016. ■

AECOM wins key advisory role on third consecutive Olympics

AECOM has been appointed as advisor to the Tokyo Metropolitan Government and Tokyo Organising Committee of the 2020 Olympic and Paralympic Games for the development of the venues and infrastructure for the Games. The appointment makes it the third consecutive Olympic and Paralympic Games AECOM has been involved with following the masterplan for London 2012 Games and Legacy and the competition-winning masterplan for Rio 2016.

Working with its partner consultant Arup, AECOM will advise on the design development of venues and contribute to the strategy for overall delivery of the design and construction of the venues from the preparation stage through to the legacy transformation. The scope of work also includes masterplan review, as well as advising on transportation, security, sustainability and legacy.

The global multidisciplinary team will be having a series of workshops in Tokyo with the client team to ensure the successful delivery of the Games and the post-Games legacy. ■

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Atkins conducts marina study for Colombo Port City

Atkins has been appointed by China Harbour Engineering Company (CHEC) to assess the opportunity of incorporating a marina into the proposed 2.5 sq km mixed use Colombo Port City development in Sri Lanka. The study is multifaceted and will establish the overall demand for marina facilities, the size of the marina, appropriate berthing mix and seek to optimise its configuration. The study will include the hydraulic modelling of the effect of the marina breakwater on the near shore coastal conditions and the adjacent Beira Lake stormwater outlet.

Philip Chiang, Atkins' project director, said, "We are very pleased to work with CHEC on this project, the first major project under our memorandum of understanding for global strategic cooperation with China Communications Construction Company Ltd (CCCC) and our global cooperation agreement with CHEC signed in April this year. It shows our strong commitment to work strategically with each other to unlock more opportunities for all parties both in China and abroad.

"The project also demonstrates how Atkins' teams from different regions can work seamlessly together to provide our partners with integrated solutions to address every stage of the development, from early stage demand assessment and planning to engineering design of associated infrastructure to make our plan a reality."

A multidisciplinary team of economists, urban planners, urban designers, marina designers and water and coastal engineers from Atkins' Asia Pacific and UK businesses is involved in the project, which will focus on three key areas. One of the areas is a market study of the marina sector in the region to estimate current and future levels of demand for sailing and motorboat facilities and to identify the boat types, sizes and traffic expected at the marina. Atkins is working closely with a number of internationally renowned marina operators to ensure the outcomes of the work are realistic and implementable. Another focus area is a layout plan for the marina, which maximises the capacity and efficiency of berths based on the market study as well as a concept plan for the landside facilities such as a club house, boat storage, maintenance and repair workshops along with commercial activities in retail, residential and hotel accommodation. The third focus area is a concept design of the breakwater to provide an active and attractive setting for the marina facilities.

Atkins has been commissioned to assess the opportunity of incorporating a marina into the proposed 2.5 sq km mixed use Colombo Port City development in Sri Lanka.

The target users of the marina facilities include the high net worth individuals purchasing the high end residential property which forms a major component of the Port City concept, local sailing and motor boat enthusiasts, visiting international yachts and commercial tourist operators active in a wide range of water based activities in Sri Lanka including whale and dolphin watching, sports fishing, diving and marine safaris.

Colombo Port City is the biggest property development project for CHEC. Other cooperation opportunities for this development are reportedly being discussed. ■

IPAF establishes first training centre in China

Haulotte Shanghai, a subsidiary of Haulotte Group, has been appointed as the first IPAF training centre in China. Two of the company's engineers are currently dedicated as IPAF trainers in the country.

"We are really proud of this appointment. For many years Haulotte Group and IPAF have worked closely to promote safety all around the world. This new step in China will increase the awareness of all the actors of our working sector, and will allow to perfectly meet our customer's requirements," commented Alexandre Saubot, COO of Haulotte Group.

"The promotion of a workplace safety culture with regulations will improve operating environments," said Tim Whiteman, CEO of IPAF.

IPAF (International Powered Access Federation) promotes the safe and effective use of powered access equipment worldwide in the widest sense - through providing technical advice and information, through influencing and interpreting legislation and standards, through its safety initiatives and training programmes. It is a not-for-profit organisation owned by its members who include manufacturers, rental companies, contractors and users. ■

From left: Tomie Chan, Haulotte Shanghai manager; Alexandre Saubot, COO of Haulotte; and Tim Whiteman, CEO of IPAF, attending the Haulotte night during bauma China 2014.

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Terex Trucks appoints Qatar dealer

Terex Trucks has appointed Rumaillah Motors as its dealer in Qatar, allowing the manufacturer to lay a strong foundation for future growth in the Middle East. Etienne Lalande, regional sales director for Middle East and North Africa said of the partnership, "Rumaillah Motors is a first-class company that has a wealth of experience working with major contractors in Qatar. Their ethos of providing strong customer support and satisfaction fits well with Terex Trucks and we look forward to a fruitful future working together."

Terex Trucks produces off-highway articulated dump trucks from 25 to 38 t payload capacity, and reliable rigid dump trucks from 41 to 91 t payload capacity. All Terex Trucks machines are designed for heavy-duty hauling operations and enable high productivity through even the most extreme working conditions, which is especially beneficial in Qatar's dry, dusty environment.

Rumaillah Motors is part of the Rumaillah Group; it provides material handling, aerial access and construction equipment across Qatar. Operating a fleet of product support units equipped with advanced diagnostic tools, the company operates a rapid customer service response 24 hours a day, 365 days of the year.

"In today's business it is important to find a strong partner that you can trust," said Rauf Malik, general manager of Rumaillah Motors. "We believe that this agreement with Terex Trucks will help us to further enhance our first-class service to customers in Qatar." ■

Terex Trucks has been operating in the Middle East for more than 20 years.

Howard Dale is new VP of global sales for Dressta

LiuGong Dressta Machinery Sp. z.o.o has appointed Howard Dale (left) as its new vice president of global sales for Dressta. Headquartered in Stalowa Wola, Poland, Dressta is the sales, marketing and after-sales & service division of LiuGong Dressta Machinery Sp. z o.o.

Mr Dale joins Dressta with 20 years of construction sales and marketing experience in China and Southeast Asia. His previous position was as a Shanghai-based regional director for CNH Industrial – a leading manufacturer of agricultural and construction equipment.

In his new role, Mr Dale will be responsible for all aspects of Dressta's global business including channel management, capacity building, after-sales and service operations and expanding the corporation's current distribution network.

Teddy Wu, president of LiuGong Dressta Machinery, said of the appointment, "Howard brings with him the rare combination of proven ability in growing construction brands in different regions, and the technical knowledge born from many years spent in various roles in the industry. We believe Howard will become a vital component in our mission to further grow Dressta's international status."

Mr Dale has spent his entire career in construction, beginning with engineering apprenticeships before quickly establishing himself in the commercial sales activities of the industry. This took him to Bangkok (Thailand) in 1992, selling backhoes for Fermac International and expanding its dealer network by seven-times in just five years. At CNH Industrial he was responsible for developing its market entry into China and establishing its distribution network and sales strategy for backhoes and skid steers.

Commenting on his new position, Mr Dale said, "My vision is to reengineer the Dressta brand – to go out and reengage with the traditional markets, and grow the brand into new markets. I believe that Dressta's ability to match its products to specific applications makes it one of the few 'customer-first' construction equipment manufacturers available today. The machines themselves are absolute powerhouses and I don't think Dressta can be rivalled in the breadth of its products' application offering. ■

Vinci builds Shieldhall tunnel in Scotland

Vinci Construction Grands Projets, in a 50-50 joint venture with Costain, is currently building the Shieldhall tunnel in Glasgow for Scottish Water. The structure, believed to be the largest wastewater storage tunnel in Scotland, is designed to improve water quality and help cope with the risk of flooding in the city and pollution of the River Clyde.

Work started in October 2014 and completion is anticipated in early 2018. The €105 million contract covers the construction of two shafts with a diameter of 15 m each and a depth of 20 m, a 300 m long cut-and-cover trench and a 5 km tunnel with an internal diameter of 4.70 m. The technique used will be that of a mud pressure type tunnel boring machine. ■

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Weir Group acquires Trio

The Weir Group has entered into an agreement to acquire Trio Engineered Products, a Chinese-American manufacturer of crushing and separation equipment for the mining and aggregates markets.

Weir is a global market leader in the provision of pumping equipment to the mining mill circuit, which separates rock from ore. The acquisition of Trio will build upon Weir's recent successful entry into the adjacent comminution segment of the mill circuit. The acquisition enables Weir to provide a more complete product and service offering to existing mining customers; leverage Trio's cost effective manufacturing platform; utilise Weir Minerals' global platform and relationships across mining markets to accelerate Trio's original equipment revenue growth, and capture a greater proportion of the aftermarket opportunity from the installed base of Trio equipment (Trio has limited service presence outside of China); and cross-sell Weir's product range in sand and aggregates markets through Trio's well established sales channels in North America and China (sand and aggregate markets accounted for 56 percent of Trio revenues in 2013).

Trio is based in Shanghai, China, where it has two manufacturing plants. The company also has facilities in the US. In 2013, 31 percent of revenues were generated in North America, primarily in the growing aggregates sector; 25 percent were in China, mainly serving the domestic mining industry; the balance were broadly spread across Australia, South America, Africa and Europe. In 2014, Trio is expected to generate revenues of around US$120 million with operating profit margins broadly in-line with Weir's Minerals division.

Trio is being acquired from majority owner Navis Capital and the company's management team. Trio's three founders have agreed to remain with the company following acquisition. Completion of the acquisition was anticipated to take place before the end of October 2014.

Keith Cochrane, chief executive of the Weir Group, said, "This agreement will allow Weir Minerals to build upon its successful comminution strategy. We'll use our Group's unrivalled global capability to promote Trio's range of complementary products, extending our addressable market and offering our mining customers a wider range of highly engineered equipment and services. Trio's established manufacturing capability and its scale and presence in aggregates markets also provides a further platform for growth."

Mike Burke, chief executive of Trio, said, "This agreement is strategically compelling for Trio, allowing the company to leverage Weir's market-leading service centre network to accelerate growth and better serve our customers' aftermarket needs on a truly global basis." ■

Skanska wins rail and building contracts in the US

The Skanska joint venture with Traylor Brothers and J.F. Shea Construction has been awarded a design-build contract by the Los Angeles County Metropolitan Transportation Authority to extend the Los Angeles Metro Purple Line. The contract is worth in total US$1.6 billion.

The project includes a 6.3 km extension of the Purple Line, as well as train control and signals, communications, traction power supply and distribution, and fare collection systems that will connect and operate with the existing system. The project schedule requires substantial completion in June 2023.

In New York, Skanska has also signed a contract with the New York Hotel Trades Council and Hotel Association of New York City to build its new Brooklyn Health Centre in New York City. The contract value is US$96 million. Skanska will build a 12-storey, 15,000 sq m healthcare centre for New York Hotel Trades Council and Hotel Association of New York City members and their families. The new medical facility will include five floors of ambulatory care services. The remaining floors being used as commercial office space for tenants. Construction is scheduled to begin in January 2015 and expected completion is November 2016.

In addition, Skanska has signed a contract with to build a 6,000 sq m educational facility in New York City. The contract value is US$60 million. Construction is planned to begin in the first quarter of 2015 and completion is expected in December 2017. ■

Soletanche Freyssinet strengthens presence in Latin America

Soletanche Freyssinet, the specialised civil engineering division of Vinci Construction, has taken its holding in the share capital of Freyssinet Espagne to 100 percent.

Freyssinet Espagne, which was previously jointly controlled with a Spanish partner, holds all of Soletanche Freyssinet's operations in the fields of structures (Freyssinet) and reinforced earth (Terre Armée) in the Iberian Peninsula, Mexico and South America.

Freyssinet Espagne posted 2013 revenue of €120 million, of which 80 percent was generated in Latin America. This latest move accelerates Soletanche Freyssinet's international expansion and raises the portion of its revenue made outside Europe to over 60 percent.

With the consolidation of a network of some 10 additional subsidiaries in Latin America, Soletanche Freyssinet will be in a position to better take advantage of the continent's growth potential, in synergy with the rest of the Vinci Group. ■

Terex to form joint venture with Manitex International

Terex Corporation has agreed to sell 51 percent of ASV to Manitex International, which will lead to a joint venture in compact track loaders and skid steers that is 51 percent owned by Manitex and 49 percent owned by Terex.

Upon completion of the transaction, ASV plans to continue selling its compact track loaders and skid steers under the Terex brand. The transaction is expected to be completed before the end of 2014.

"The formation of this joint venture is a positive for both Terex and ASV. Terex preserves its broad compact equipment product offering and its participation in an expected housing recovery. Manitex will augment ASV's existing distribution channels, allowing for faster growth of the ASV business," said Ron DeFeo, chairman and chief executive officer of Terex. Included in the transaction is ASV's Grand Rapids, MN manufacturing facility and certain assets held at Terex's Southaven, MS distribution centre. ■

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Date	Events in Asia	Organiser & Contact
11 to 15 Mar 2015	Worldbex 2015 World Trade Centre Metro Manila Manila The Philippines	Worldbex Services International Tel: +632 656 9239 Email: info.worldbex@gmail.com Website: www.worldbex.com
19 to 22 Mar 2015	Megabuild 2015 Jakarta Convention Centre Jakarta Indonesia	PT. Reed Panorama Exhibitions Tel: +65 6789 8800, ext 4537 Email: meenyi.phua@reedpanorama.com Website:www.megabuild.co.id
27 to 29 Mar 2015	Constech 2015 Impact Exhibition & Convention Centre Bangkok Thailand	Impact Exhibition Management Co Ltd Tel: +66 2833 5208, Fax: +66 2833 5127-9 Email: pasinc@impact.co.th Website: www.thailandconstech.com
2 to 4 Apr 2015	BuildTech Yangon 2015 Myanmar Convention Centre Yangon Myanmar	Sphere Exhibits Pte Ltd Tel: +65 6319 4037 Email: lingoh@sph.com.sg Website: www.btyangon.com
23 to 26 Apr 2015	OneBuild@JB 2015 Danga City Mall, Johor Bahru Johor Malaysia	One International Exhibition Sdn Bhd Tel: +603 8943 7488, Fax: +603 8943 7599 Email: info@oneinternational.com.my Website: www.oneinternational.com.my
9 to 12 Sept 2015	Construction Indonesia 2015 Jakarta International Expo Kemayoran, Jakarta Indonesia	PT Pamerindo Indonesia/IEM/OES Tel: + 65 6233 6777, Fax: +65 6233 6768 Email: violet@iemallworld.com Website: www.constructionindo.com
22 to 25 Sept 2015	BICES 2015 New Beijing International Exhibition Centre Beijing China	CCMA, CNCMC and CCPIT - MSC Tel: +86 10 5222 0905 Email: bob.ban@e-bices.org Website: www.e-bices.org
7 to 10 Oct 2015	Buildtech Malaysia Putra World Trade Centre (PWTC) Kuala Lumpur Malaysia	Trade Link ITE Sdn Bhd Tel: +603 7842 9863, Fax: +603 7842 7863 Email: info@tradelink.com.my Website: www.tradelink.com.my/buildtech
28 to 30 Oct 2015	Concrete Show Southeast Asia 2015 Jakarta International Expo Jakarta Indonesia	UBM Tel: +62 21 2930 5959, Fax: +62 21 2930 5960 Email: niekke.budiman@ubm.com Website: www.concreteshowseasia.com
22 to 26 Nov 2016	bauma China 2016 Shanghai New International Expo Centre (SNIEC) Shanghai China	Messe Muenchen International Tel: +49 89 949 20251, Fax: +49 89 949 20259 Email: info@bauma-china.com Website: www.bauma-china.com
Date	**Events outside Asia**	**Organiser & Contact**
3 to 6 Feb 2015	World of Concrete 2015 Las Vegas Convention Centre Las Vegas, Nevada USA	Hanley Wood Exhibitions Tel: +1 972 536 6300, Fax: +1 972 536 6301 Email: contactus@worldofconcrete.com Website: www.worldofconcrete.com
20 to 25 Apr 2015	Intermat 2015 Paris-Nord Villepinte Paris France	Intermat Construction Email: contact@intermatconstruction.com Website: www.intermatconstruction.com
11 to 17 Apr 2016	Bauma 2016 Munich Trade Fair Centre Munich Germany	Messe München GmbH Tel: +49 89 949 11348, Fax: +49 89 949 11349 Email: info@bauma.de Website: www.bauma.de

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BuildTech Asia 2014 highlights productivity improvements

BuildTech Asia 2014, which took place from 14 to 16 October 2014 in Singapore, drew about 6,300 visitors and over 200 exhibitors from nine countries including Australia, China, Germany, Ireland, Hong Kong, Malaysia, Korea, Singapore and Taiwan. The three-day annual trade show was organised by Sphere Exhibits and hosted by the Building and Construction Authority (BCA), under the Singapore Construction Productivity Week.

Following the government's announcements on day one of the show that highlighted the push for integration of productivity improvements along the construction value chain, visitors were able to witness various technologies at work on the show floor.

Australian company Lend Lease demonstrated the use of Cross Laminated Timber – a recyclable material that saves costs – in the construction process. Taiwan's EPADA introduced Easy DIY Green Bricks (EDGB) – reusable building material that is especially suitable for DIY projects and greatly reduces time and labour costs. A robotic arm from Future Cities Laboratory (FCL) and Rob Technologies demonstrated how it could lay floor tiles without manual labour. Autodesk highlighted advancements in Building Information Modelling (BIM) that identifies conflicts before construction takes place, preventing unproductive and wasteful use of resources.

In addition, one of Singapore's leading equipment providers JP Nelson signed an MoU with Civil Tech for the use of two Buma casing rotators that cut through odd shaped boulders, hard rocks, steel and concrete up to 40 m deep. The equipment is well-suited to challenging requirements such as the Thomson Line MRT construction project. Another MoU was signed with Antar and Fuchi for one unit of Fuwa 65 t telescopic crane.

Above and below: The show attracted approximately 6,300 visitors and over 200 exhibitors from nine countries.

BuildTech Asia 2014 was hosted by the Building and Construction Authority under the Singapore Construction Productivity Week.

During the show, one of Singapore's leading equipment providers JP Nelson signed an MoU with Antar and Fuchi for one unit of Fuwa 65 t telescopic crane.

A customised series of experiential tours were conducted for regional guests to visit and learn about some of construction projects in Singapore and around the world. Beginning with a tour of the exhibition show floor, the delegates then visited the Singapore Sports Hub.

With the two new Integrated Construction and Precast Hubs for automated manufacturing of Prefabricated Pre-finished Volumetric Construction (PPVC) modules set to be opened over the next two years, visitors also had the opportunity to explore prefabricated rooms and bathrooms on the show floor.

Over 12 trade associations and business delegations from Indonesia, India, Malaysia, Myanmar, Russia and Vietnam attended BuildTech Asia 2014 to explore the latest technologies on the show floor, key project sites in Singapore and manufacturing facilities. Local trade delegations also networked and established business relationships while pursuing commercial partnerships on the trade floor.

Furthermore, industry thought leaders shared their knowledge and expertise with over 300 delegates at the Facilities Management Conference 2014 and the Environment Sustainability Conference 2014.

BuildTech Asia is scheduled to return to Singapore Expo in October 2015. ■

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First CATAP conference in Singapore ends on positive note

The inaugural International Cranes and Transport Asia Pacific (CATAP) conference was held on 30 September 2014 at the Grand Copthorne Waterfront Hotel in Singapore. Drawing 167 attendees, the event was part of the three-day Singapore Crane Fair, which also featured the Crane Carnival 2014 (28 September) and Crane Safety Symposium (29 September). The CATAP conference was created and organised by International Cranes and Specialized Transport magazine, American Cranes & Transport magazine and KHL.

Keynote speaker at the conference was Rajiv Biswas, chief Asia economist at IHS, who presented an economic roundup and outlook for the region. Mohamed Abdul Akbar Bin Mohamed Abdul Kader, chairman of the National Crane Safety Taskforce in Singapore, talked about safety in Singapore's crane industry. This was followed by Bryan Cronie, Asia Pacific regional SHE-Q and training director at Mammoet (S) Pte Ltd, who highlighted the importance of creating a safety culture.

Market and rental was another topic of discussion at the conference. Highlights included presentations by Han Soe Kyaw from Two Elephant Crane & Forklift, one of Myanmar's largest crane rental companies, who gave an insight into the developing crane market in the country; Rob West, general manager of Tutt Bryant Heavy Lift & Shift, who explained the standards, expectations and challenges of crane rental in Australia; and John Stewart, senior vice president - sales and marketing at Manitowoc Cranes Asia, who shared the trends, markets and opportunities in Asia's heavy lifting industry.

Han Soe Kyaw from Two Elephant Crane & Forklift talks about Myanmar's developing crane market.

Rob West, general manager of Tutt Bryant Heavy Lift & Shift, explains the standards, expectations and challenges of crane rental in Australia.

The round table session on China's crane market.

Attendees take a look at the products on display at the exhibition area outside the conference room.

Furthermore, executives from three major Chinese manufacturers spoke about China's crane market. These included Zhang Han Xu, vice general manager, hoisting machinery business division, XCMG; Su Wu, market manager, Zoomlion Construction Hoisting Machinery Company; and Li Mingqi, vice president, research institute, and president, telescopic boom product institute, Zhejiang Sany Equipment Co Ltd (Sany Heavy Industry). Topics covered included mobile crane trends in China; trends, technologies and outlook in China's tower crane market; and China's nuclear power plant programme. A round table session was also held afterwards.

The CATAP conference was supported by several associations and organisations, among which were the Crane Industry Council of Australia (CICA), National Commission for the Certification of Crane Operators (NCCCO), Singapore Cranes Association (SCA), Specialized Carriers and Rigging Association (SCRA) and Workplace Safety and Health (WSH) Council. ■

Website: www.khl-group.com/events/catap

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	lifting capacity
BME-G series (European model)	80t
BMS series (Standard model)	80～100t
BMS1200HD (Standard model)	120t

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TK series	55～75t

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Buildtech 2014

Buildtech 2014, Malaysia's international building materials and construction technology exhibition, attracted more than 5,000 visitors from both Malaysia and across Southeast Asia. These visitors included developers, architects, engineers, planers, builders, building owners, interiors designers and renovation specialists, to name a few.

Exhibitors came not only from Malaysia but also from other countries and regions such as the UK, China, Thailand, Korea, Taiwan, Singapore as well as Europe and the Middle East.

Buildtech occupied an area of over 10,000 sq m, taking place from 8 to 11 October 2014 at the Putra World Trade Centre in Kuala Lumpur, Malaysia. Organised by Trade Link ITE Sdn Bhd, the show is endorsed by the Ministry of Works Malaysia (KKR), Malaysian Public Works Department (JKR) and Malaysia External Trade Development Corporation (MATRADE).

The next edition of Buildtech is scheduled to be held from 7 to 10 October 2015 at the Putra World Trade Centre in Kuala Lumpur. ■

Website: www.tradelink.com.my/buildtech

Top and above: Occupying an area of over 10,000 sq m, Buildtech took place from 8 to 11 October 2014 at the Putra World Trade Centre in Kuala Lumpur, Malaysia.

Concrete Show SEA 2014

More than 5,000 visitors from Indonesia and neighbouring countries attended the 2014 Concrete Show South East Asia exhibition and conference, which was held from 15 to 17 October 2014 at the Jakarta International Expo, Indonesia. The show drew nearly 200 exhibitors from 24 countries.

Running simultaneously with the exhibition were a conference and seminar programmes, which included keynote sessions by Indonesia's vice minister of Public Works, the Indonesian Association of Precast and Prestressed Concrete Companies, and the Indonesian Society of Civil and Construction Engineers.

Indonesia's construction sector is expected to accelerate rapidly as the new government rolls out a series of infrastructure projects such as the Giant Sea Wall, new toll roads and expansion of integrated seaports. To prepare for these upcoming mega projects, the government has reportedly planned to boost the growth of the precast and prestressed concrete industry in the country.

Concrete Show South East Asia was launched in 2013 and is held annually. The third edition of the show is planned to be held from 28 to 30 October 2015 at the Jakarta International Expo, Kemayoran, Indonesia. ■

Website: www.concreteshowseasia.com

Top and above: Concrete Show South East Asia was launched in 2013 and is held annually. The second edition of the show was held from 15 to 17 October 2014, with nearly 200 exhibitors from 24 countries.

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IPAF at bauma China

IPAF recently held a networking reception during bauma China 2014 in Shanghai to celebrate the opening of the IPAF China office and the launch of IPAF operator training materials in Chinese.

The event was attended by IPAF members and anyone who manufactures, rents, distributes, operates, uses or works with mobile elevating work platforms (MEWPs), also known as aerial work platforms (AWPs). Attendees had the chance to learn about IPAF's new office and planned activities in China, and get insights on how IPAF operator training can increase safety and productivity in their businesses.

The launch and networking reception also offered an opportunity to meet representatives working in the Chinese MEWP industry – equipment manufacturers, rental companies, contractors, end-users, health and safety authorities, and associations. Representing IPAF were Bai Ri, IPAF's new representative for China; Raymond Wat, regional general manager, IPAF South East Asia; and Tim Whiteman, IPAF CEO.

IPAF's stand at bauma China promoted the Federation's activities for the industry, raise awareness of how MEWPs provide a safe and effective way to perform temporary work at height, and offer solutions to keep the industry safe through operator training and technical and safety resources. ■

IPAF held a networking reception during bauma China 2014 to celebrate the opening of its China office and the launch of its operator training materials in Chinese.

One million PAL Cards: Verify and win

IPAF has issued the one millionth ever PAL Card (Powered Access Licence) under its voluntary, industry-led operator training programme which is certified by TÜV as conforming to ISO 18878.

To celebrate the one millionth PAL Card ever issued, IPAF is calling all valid PAL Card holders to enter a draw for some amazing prizes. The PAL Card expires after five years and there are currently more than 500,000 valid PAL Cards worldwide.

There will be five top prizes for verified operators to win a free trip to the access event of the year, the IPAF Summit and International Awards for Powered Access (IAPAs) – flight, accommodation and gala dinner included. This event will be held on 25 and 26 March 2015 at the Crystal Gateway Marriott Hotel in Arlington, Virginia, USA. Details at www.iapa-summit.info.

"The secret of the PAL Card's success is the guarantee that the training and testing is delivered to consistent standards worldwide by highly motivated and qualified instructors," said IPAF CEO Tim Whiteman.

All valid PAL Card holders are invited to enter the draw by verifying their PAL Card at www.ipaf.org/checkpal. The competition closes on 26 January 2015. The winners will be announced on 1 February 2015. ■

IPAF joins SISO seminar in Singapore

IPAF technical & safety executive Chris Wraith (third from left) spoke on the safe management of MEWPs at a seminar organised by the Singapore Institution of Safety Officers (SISO) in October 2014. ■

PAL Cards getting 'smart'

All PAL Cards (Powered Access Licences) issued by IPAF for training on or after 1 January 2015 will be machine-readable, i.e. Smart PAL Cards. This move aims to improve site safety as Smart PAL Cards may be used to ensure that only trained operators can use mobile elevating work platforms (MEWPs) and mast climbing work platform (MCWPs) on site.

The Smart PAL Card is marked by a wireless icon and has a chip embedded in it. The data stored on the card, such as the operator name, number and categories trained in, is also printed on it, which means that the Smart PAL Card can still be used as a standard version.

The data in the chip can be read by a card reader fitted to the machine. The reader can be set up to accept certain data (e.g. level of training, machine categories) which in turn will allow the machine to be operated. This means that a machine can be programmed to start only if the operator has had the correct training.

Using a Smart PAL Card along with a reader device can allow control of machine access and thereby improve site safety. Site managers can use the system to ensure that only correctly trained operators can operate MEWPs or MCWPs. They can also track who has used which machine for how long, and prevent fraudulent use.

"It is not compulsory to fit card readers on machines and the PAL Card is a recognised qualification on many job sites," said IPAF CEO Tim Whiteman. "The smartcard technology brings more options and opens up possibilities to make machine access safer and machine use more secure."

The validity of a card can be checked by using the online verification tool at www.ipaf.org/checkpal. ■

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Sennebogen introduces largest telescopic crawler crane

Sennebogen has recently launched its biggest telescopic crawler crane, the 6113, which has a maximum boom length of 67 m and safe working load of 120 t. It is powered by a 168 kW Cummins engine combined with a soot particle filter and a cutting-edge exhaust aftertreatment system, meeting Tier 4f emission standards. A Tier 3 engine is also available, said Sennebogen.

The key advantage of the 6113 is its strong telescopic boom, designed as full-power boom. Thanks to multi-cylinder technology, this maintenance-free system enables continuous telescoping and is always friction-locked. The machine can be set to any desired boom length variably and quickly via joystick, which would save time and allow efficient work, particularly when boom lengths alternate in implementation.

Featuring a length of 40 m, the Sennebogen 6113 covers a large work area. With fly boom and lattice boom extensions, boom heights up to 70 m can be achieved. The machine is able to manoeuvre comfortably even in rough terrain. Tasks to maximum 4 degree inclined position can be carried out easily, thanks to the robust boom.

The 8 m long heavy duty travelling gear elements with up to 900 mm wide base plates, on one hand, ensure the customary low ground pressure, and on the other hand, the best possible stability, also due to the undercarriage that can be telescoped out to a track width of 5.40 m.

The Sennebogen 6113 is suitable for use on narrow construction sites. With a robust boom the machine has proven itself, not just as a crane with lifting tasks, but also in dynamic implementation, special underground engineering applications and applications with hydraulically powered implements, such as vibrators. The implementation versatility is rounded out in combination with an elevating work platform with a load-bearing capacity of up to 1,000 kg. Thus the use range of the machine is extended with deployments in the areas of demolition and re-naturation, as well as for maintenance and service tasks in each and every terrain.

For the driver, the maXcab comfort cab with sliding door, which can be inclined 20 degrees, offers good ergonomics and an excellent overview. Typical for Sennebogen is the optional possibility of designing the cab with 2.70 m height-adjustability, in order to maintain the unique overview and safety advantages.

Above and below: The Sennebogen 6113 has a maximum reach of 67 m and safe working load of 120 t.

Equipped with the innovative self-assembly system of the Starlifter telescopic undercarriage, the 6113 can be set up in a few steps, within a short time. When the travelling gear is dismounted the transport width is reduced to 3 m.

In addition, the machine offers significant energy savings in Eco Mode, operating at a reduced engine speed. The new Sennebogen Sencon control and diagnostics system offers a clear presentation of all operating parameters and easy, intuitive user control, as well as the ability to fine-tune machine performance and easily and quickly process error messages. Furthermore, the load moment limitation system can be easily and reliably monitored.

The 6113 is also easy to maintain and service. A central lubrication point for all pivot points and the slewing ring reduces the required amount of service effort, optimises accessibility to all service points and important components, and saves time in daily operation. ■

Enquiry: burgmer.m@sennebogenpl.com

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Indoogoo: social network for heavy industry

Indoogoo, the social network for heavy industry, offers users the opportunity to buy, sell and rent heavy equipment while expanding their social and trading networks. Available on all platforms, the site allows users to create a company profile and upload listings that include up to 10 photos and four videos per piece of equipment, as well as a comprehensive resource library. Users looking to buy a specific piece of equipment can also create a request for quotation (RFQ) to help track down exactly what is needed.

As with other social networks, Indoogoo allows users to find new customers and suppliers, and to stay in touch with colleagues around the globe. However, as the site is based on the established principles of trading within heavy industry, Indoogoo keeps contact data strictly private and does not share these details between users.

The addition of Yard Talk, a discussion forum, gives users the opportunity to discuss industry news and developments. This forum brings together manufacturers, end-users and traders of heavy equipment to introduce new products, ask relevant questions or simply chat about the latest news.

Indoogoo is a valuable tool for construction companies, equipment dealers, rental companies, oil and gas companies, contractors and service providers. Founded in 2012, Indoogoo is registered in the UAE and its offices are located in Dubai.

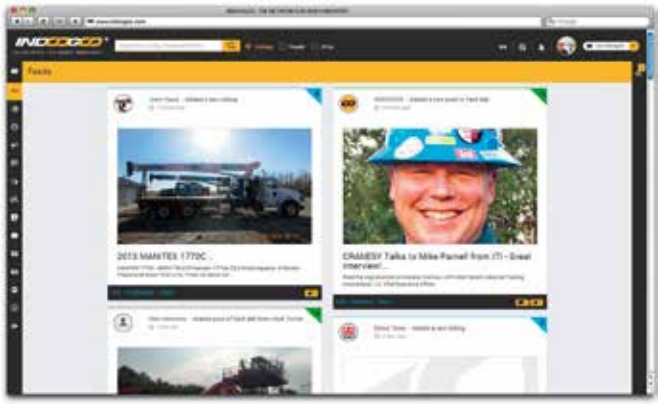
Renting made easy

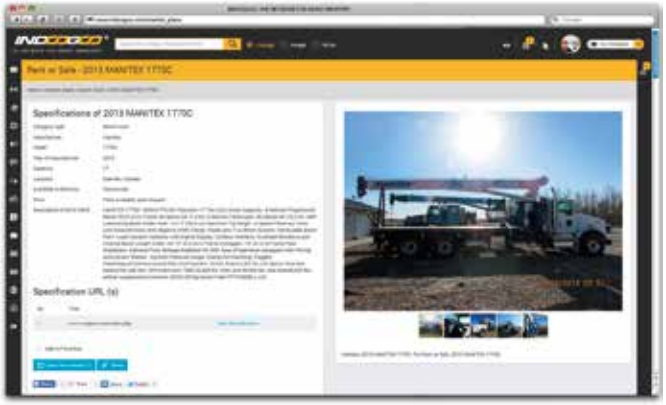
'My Rentals' from Indoogoo is designed to help users easily locate and rent heavy equipment. Users range from big name rental companies to smaller local traders, and everyone is invited to hire out their equipment and search these tailor-made listings for the best local rental deals.

The My Rentals process is simple. After signing up for free at www.indoogoo.com, users looking to rent equipment can search for the machinery they need, specifying exactly where and when it is needed. The innovative geolocation technology compares these search criteria to all equipment near the given location, and the user is presented with a customised map showing all suitable machinery in this area.

Each piece of equipment is marked with a flag; by hovering over a flag with the cursor, the user can see the details of the listing in brief, and by clicking on the flag the user is taken straight to the full listing page. From here, the potential customer can contact the rental company directly to request a quotation. Conversely, those looking to put their equipment up for rent simply upload their listing and specify their location in order to be added to the map.

'My Rentals' from Indoogoo is designed to help users easily locate and rent heavy equipment. Even better, users can locate rental equipment in their area.





Top and above: Indoogoo, the social network for heavy industry, offers users the opportunity to buy, sell and rent heavy equipment while expanding their social and trading networks. The site is based on the established principles of trading within heavy industry, so it keeps contact data strictly private and does not share these details between users.

Indoogoo is available on all platforms.

With My Rentals, users can also locate rental equipment in their area, connect with other local professionals and expand their trading network. By tracking down equipment close to their jobsites, users can reduce demobilisation and mobilisation costs and, because the service is 100 percent free, procurement costs are also kept to a minimum.

Users of My Rentals also benefit from all the other innovative features that Indoogoo offers. ■

Website: www.indoogoo.com

Pile Dynamics revamps PDA system

Pile Dynamics has released a new model of Pile Driving Analyzer (PDA) system, the PDA-8G. Like previous PDAs, this eighth generation model performs the test normalised by the American Society of Testing and Materials standard (ASTM D4945). The test, which is said to have been accepted as an alternative for static load tests in various countries around the world, takes place either during pile driving or when a substantial mass impacts a non-driven pile. At each impact the PDA takes data obtained by sensors attached to the pile and calculates bearing capacity and other quantities.

In the new PDA-8G these quantities number more than 230 - a trove of information to the geotechnical engineer, who does not even need to be at the job site. With this new model, Pile Dynamics has made its SiteLink technology easier to use. SiteLink transmits test data in real time from the field to an office computer at an alternate location. The majority of engineers will probably still use the PDA-8G in the field, however. For them, Pile Dynamics made a tablet-like PDA that is thinner than previous models, light, ergonomic, and with a high visibility touch screen display that responds to gesture controls like swiping and pinch-to-zoom.

The PDA-8G is being offered with either four or eight universal channels of data acquisition, all compatible with both cabled and wireless sensors. This enhancement from previous models is of particular interest to those who test large diameter shafts. Data transfer from the sensors to the PDA is extremely fast, suitable to test piles driven with high blow rate hydraulic hammers. The PDA-S software includes extensive data input help and output customisation, and two real time capacity calculation methods (CASE and iCAP, which is similar to the CAPWAP software). Incidentally, a new version of the CAPWAP data analysis software is also being released. All PDA systems include licenses of CAPWAP, of the GRLWEAP Wave Equation Analysis software and of the complete PDA software suite. ■

Pile Dynamics has a new model of PDA system, the PDA-8G.

Enquiry: info@pile.com

Latest version of Enerpac SyncHoist system

The latest version of the Enerpac SyncHoist system is designed to enhance crane performance and safety while reducing costs. This new system, which also features diesel power for operational versatility, offers load manoeuvring vertically and horizontally using one crane to control loads up to hundreds of tons, while reducing the risk of damage from oscillations of wire rope due to sudden crane starts and stops.

Employing intelligent hydraulics to monitor and guide compact but powerful 700 bar double-acting push-pull cylinders integrated into four lifting points above loads, the SyncHoist SHS system is also used for pre-programmed positioning, tilting and aligning of loads and for counterweighting and determining their centre of gravity.

Wireless control of the latest SyncHoist enables a crane driver to more simply perform complex load lifting, shifting and positioning manoeuvres from his cab, ensuring loads remain evenly positioned during the process and performing point load indications and checks where required, explained Enerpac.

Diesel power means the system can be deployed virtually anywhere without its hydraulic functionality being dependent on fixed or separate power sources, such as generators. This independence is particularly useful for projects involving remote applications such as oil, gas, mining and energy, and large-scale applications such as bridges, ports, shipbuilding and infrastructure.

Top and above: The latest version of the Enerpac SyncHoist system - which also features diesel power for operational versatility - is particularly useful for projects involving remote applications such as oil, gas, mining and energy, as well as large-scale applications such as bridges, ports, shipbuilding and infrastructure.

Available in load capacities customised to individual tasks, with system reach of 1,500 mm from each of several lifting points, SyncHoist offers very high accuracies (+/- 1.0 mm), less dependence on weather conditions and vastly improved operating speed and worker safety.

The Enerpac SyncHoist system for cranes is a member of the Enerpac synchronous lifting family, which has already been used in major applications across Southeast Asia. Specific applications include positioning of roof sections, bridge sections, concrete elements and steel structures; positioning of turbines, transformers and fuel rods; precise machinery loading, mill rod changes and bearing changes; precise positioning of pipelines and blow out valves; and positioning and aligning of ship segments prior to assembly.

Manual control options for the four lifting points with 1,500 mm system reach include manual control with manual directional control valves; extended manual control with joystick controls and position display; and PLC control with fully closed-loop control system. ■

Enquiry: salesasia@enerpac.com

Flexible, modular concrete batching plants

IPS-Eurotec Asia Pacific Pte Ltd offers concrete batching plants for ready-mix, precast concrete applications and special infrastructure projects such as dams, bridges and airport constructions. Among them are the 4EXCEL48, 5MZ3000T and 3ECO60, with an output capacity of 48 cu m/hr, 100 cu m/hr and 60 cu m/hr respectively.

Both stationary and portable models are available from Eurotec, ranging from 30 to 250 cu m/hr. The company can also provide customised solutions based on the project's requirements.

Eurotec plants are suitable for use in various climates, even where the environmental conditions are corrosive to steel structures, said the company. And thanks to their modular design, the plants can be transported easily around the world. Such design also allows easy assembly and disassembly on job sites. ■

Enquiry: info@eurotec.com.sg

The Eurotech 3ECO60 has an output capacity of 60 cu m/hr.

Rapid Upgrading of Existing Quay Wall

No anchoring or tie-rodding is required so existing operations can be maintained.

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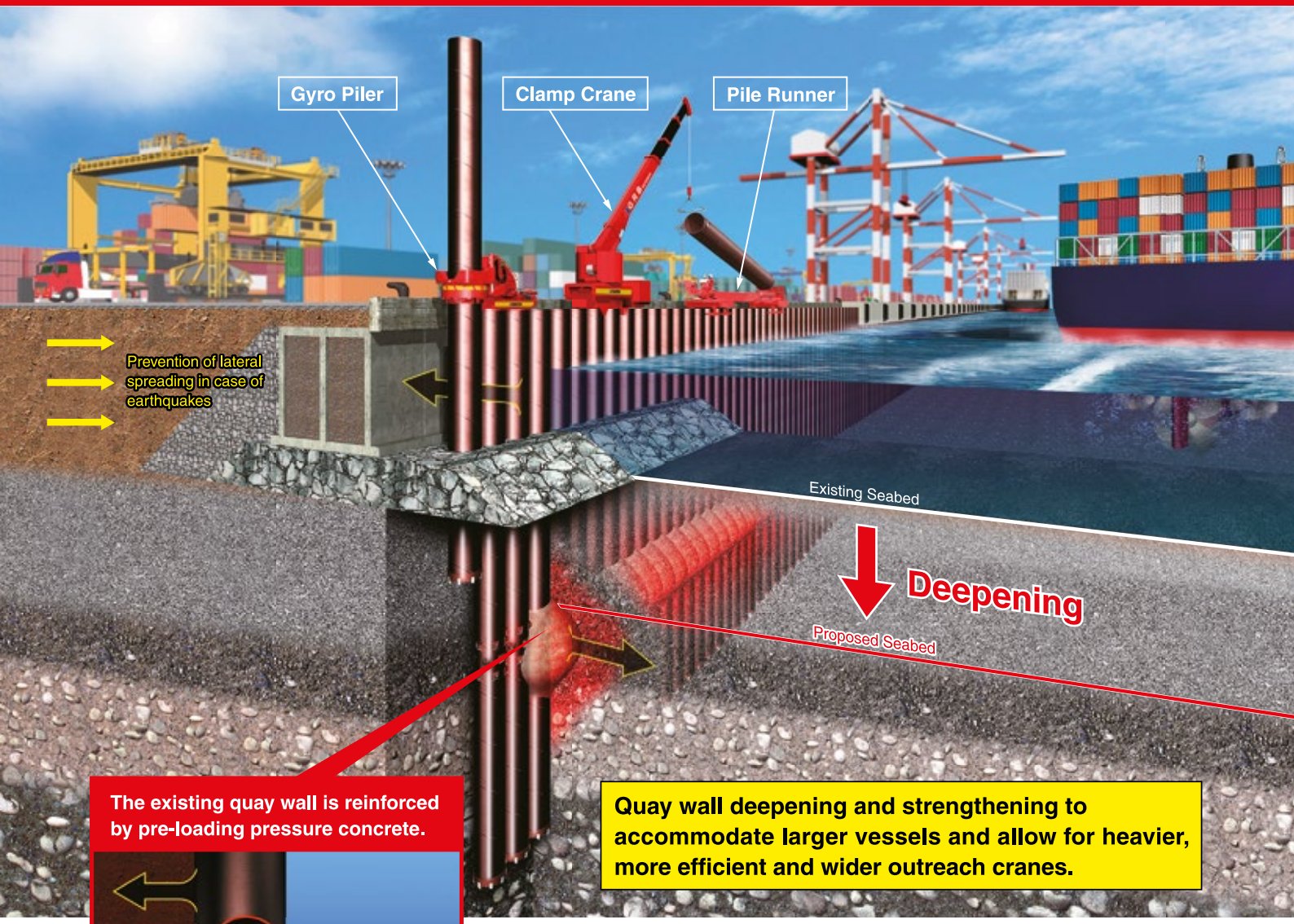
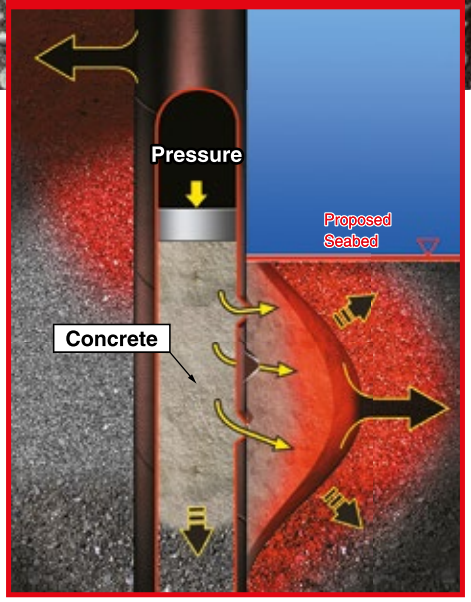


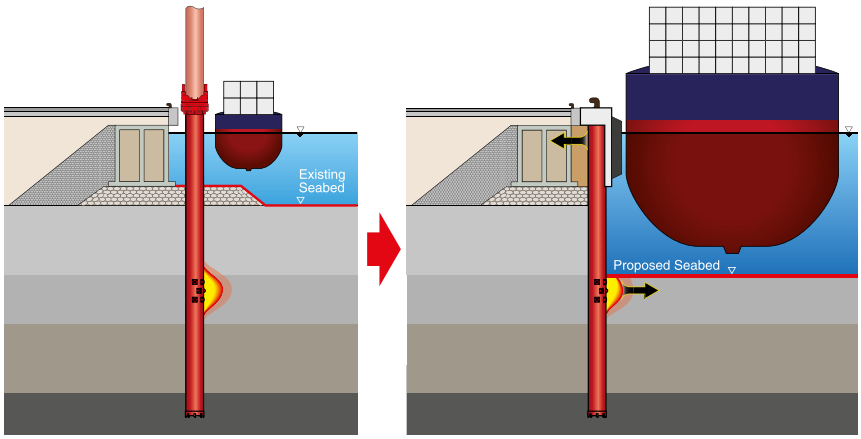
Quay wall deepening and strengthening to accommodate larger vessels and allow for heavier, more efficient and wider outreach cranes.

The existing quay wall is reinforced by pre-loading pressure concrete.



No disruption to existing operations during the construction phase.

Larger vessels can be accommodated after deepening the berth.



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Offices: Japan, USA, UK, Germany, Singapore, China

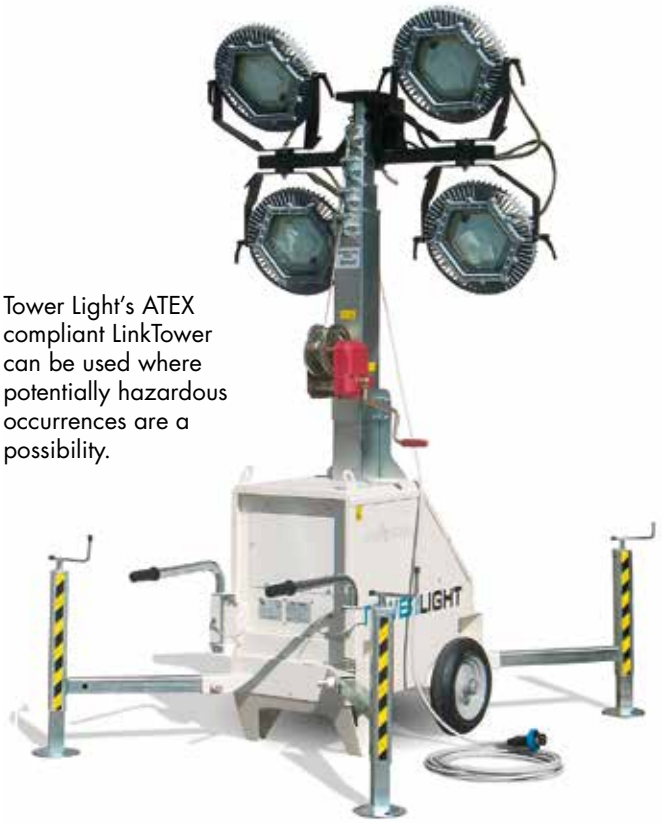
ATEX compliant lighting tower from Tower Light

The LinkTower from Tower Light is an individual lighting system that has all the features and benefits of a standard tower floodlight but with the added benefit of being able to safely link together, resulting in a row of powerful lighting sets all from one power source – mains or generator – therefore it consumes zero amount of fuel in its own right. Illumination is from four 150-W LED lamps fitted to a 7 m vertical, manually operated, stainless steel mast. The system has no discernable noise output, meaning that the standard LinkTower can be deployed on mining, construction sites and highway projects, as well as events and shows. The ATEX compliant set can be used where potentially hazardous occurrences are a possibility.

ATEX product certification is an EU requirement to ensure product conformity for equipment being operated in potentially explosive atmospheres. It involves detailed examination, testing and assessment of all equipment intended for use in hazardous areas. Tower Light redesigned its existing LinkTower product to comply with this requirement and was awarded Zone 2 ATEX certification. The company has also just completed an order from Kentech Qatar Technical Services for a fleet of ATEX standard LinkTowers.

Tower Light produces a wide range of light towers available worldwide, either mobile or static, with or without generators and with LED, halogen or metal halide lamps. Standard Tower Light sets are suitable for many different kinds of markets, however, Tower Light is keen to design and produce bespoke lighting towers with special specifications (i.e. to ATEX regulations) with the aim to increase its presence in numerous market sectors. Tower Light is part of the US-based Generac Power Systems Group. ■

Enquiry: info@towerlight.com



Tower Light's ATEX compliant LinkTower can be used where potentially hazardous occurrences are a possibility.

FAV hydraulic vibroflot for cost efficient solution

Foundation Associates Engineering (FAE) produces FAV VF-series hydraulic vibroflot. The latest model in this series is the VF 410, which features a maximum eccentric force of 414 kN, frequency of up to 1,800 rpm and diameter of 410 mm. According to FAE, with the amount of frequency and eccentric force produced, the VF 410 is currently the most cost efficient model in the VF series.

The FAV VF-series vibroflot is designed to be user friendly, easy to maintain and cost efficient. It has been used on several projects not only within Singapore, but also in other countries such as Malaysia and Sri Lanka.

Vibroflots are normally used on soil improvement projects for non-cohesive soils by rearranging the grain distribution pattern, explained FAE. This could be achieved by the cyclic vibration that is driven by the eccentric weight and hydraulic motor that generates the vibrating and oscillating motion of the vibroflot. Vibroflotation's goal is to increase the strength while reducing the compressibility, transforming the loose state to a dense state of soil, and thus raising the relative density of the soil. ■

Enquiry: fnapl@singnet.com.sg

A unit of FAV VF-series hydraulic vibroflot is seen here being suspended from a crawler crane on a job site.

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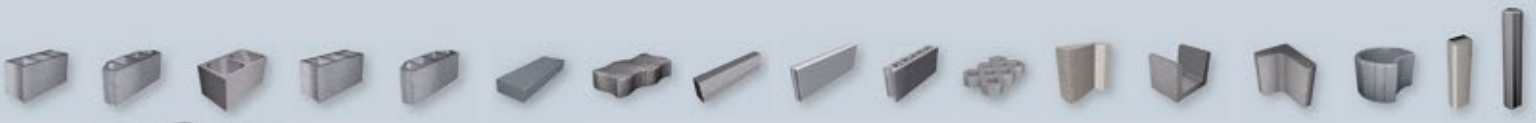

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E-mail : sales12@qzmachine.com

Liebherr 380 EC-B 16 Litronic makes Hong Kong debut

Liebherr's 380 EC-B 16 Litronic flat-top crane range has made its first appearance in Hong Kong, working on the expansion of Hong Kong International Airport.

Two 380 EC-B 16 Litronic units are being deployed on the Midfield Concourse project by Gammon Construction Ltd under a HK$6.2 billion contract for the Airport Authority Hong Kong. The contract, No P533, is said to be the largest solo contract ever awarded to Gammon Construction.

The Airport Authority Hong Kong is developing a new passenger concourse in order to increase the total number of passenger aircraft stands to meet future demand at the airport. Contract P533 is the main works contract and includes the construction of the Midfield Concourse (MFC) to a standard commensurate with that of Terminal 1.

This multi-level building has a large clear open-span steel truss roof, high standard internal finishes and a full range of building services and airport systems in the midfield area of the airport, plus 19 fully serviced aircraft stands and associated fixed link bridges and aircraft loading bridges. It also includes an extension of the APM tunnel from Terminal 1 to the Concourse, a new taxiway with connections to existing taxiways and an extension of the South Runway Road.

The 380 EC-B 16 Litronic can lift a maximum load of 16 t, and with a jib length of 75 m can lift 3.4 t at the end of the jib.

The two cranes are based on the very slim but extremely strong 355/380 IC tower system, which is ideal for very narrow sites and perfect for floor-climbing use. The cranes are being used mainly for lifting steel structural frame elements and beams. The loads will weigh up to 12 t or more, and the specifications for the 380 EC B 16 Litronic are such that the two cranes will be handling all the primary lift requirements on the steel structure.

Two Liebherr 380 EC-B 16 Litronic flat-top cranes are working on the expansion of Hong Kong International Airport.

Both 380 EC-B 16 Litronic cranes were delivered to Gammon by Liebherr's distributor for Hong Kong, Shriro Machinery Co Ltd. Gammon's contract is scheduled for completion in September 2015. ■

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Trimax supplies crushing plant to Indocement's quarry

Trimax Machinery has been awarded a contract to supply its crushing plant to Indocement's quarry in Rumpin, West Java, Indonesia. The contract called for secondary and tertiary cone crushers capable of 300 t/hr of combined 0-28 mm products, a grizzly feeder, vibrating screens and skid-mounted structures with the conveyor belts. Stringent requirements and specifications were placed on the pre-fabricated structures, including permitting only pre-approved internationally recognised brands to be used on all peripheral equipment such as conveyor rollers, conveyor belts, plummer blocks, bearings, gear boxes, etc.

During the plant installation, the customer requested for an extended scope of the project. The used primary jaw crusher and the discharge conveyor from the jaw crusher were to be replaced as well. Trimax then agreed to supply its C1008 jaw crusher and a new conveyor once the secondary and tertiary sections were completed.

Installation of the Trimax C1008 jaw crusher and modification work on the primary section were all completed within two weeks. Afterwards, the capacity performance test was conducted and produced satisfying results, said Trimax. The overall crushing plant capacity achieved more than 360 t/hr, instead of 300 t/hr as originally requested by the customer.

PT Indocement Tunggal Prakarsa Tbk is one of Indonesia's major producers of quality cement and specialty cement products marketed under the brand name 'Tiga Roda'. Part of HeidelbergCement Group, Indocement also owns several subsidiaries that produce ready-mix concrete (RMC), as well as manages aggregates and trass mining. ■

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Trimax NS300 secondary cone crusher, Trimax NH400 tertiary cone crusher and Trimax ADplus (1,525 mm x 3,660 mm) x 2 deck vibrating screen on a skid-mounted prefabricated structure.

The crushing plant in full production.

Linnhoff's TSD asphalt plant ideal for various locations

A Linnhoff TSD2000 asphalt plant was recently working on the runway resurfacing project at the Phuket International Airport in Thailand. With its plug-and play capabilities, the plant could be installed easily to produce hot mix asphalt within three weeks. The reliability of the TSD2000 was also put to the test by the restricted working hours due to air traffic and safety requirements.

In addition, a Linnhoff TSD1000 was previously set up for local road resurfacing works on a remote island in the Philippines, where access is only possible by ferry from Cebu. A Linnhoff TSD1500 was also used on the Mactan-Cebu International Airport runway project in the Philippines. Upon completion, the plant was relocated to another job site in Cebu.

Linnhoff's TSD series asphalt plant is highly mobile and versatile. Each module can be attached to a prime mover for easy land transportation and relocation. The plant is suitable for short- and long-term projects, such as airport runways, highways and local road works, in various locations including urban areas and remote islands.

Like Linnhoff's other asphalt plants, the TSD series also adopts the unique dual-purpose, screen drum technology. This technology combines the processes of drying and screening for raw materials into the same drum, effectively reducing fuel consumption and maintenance cost, and in turn maintaining a low plant operating cost. ■

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Above and left: Linnhoff's TSD series asphalt plant is highly mobile and versatile. Seen here are two models - the TSD2000 on the runway resurfacing project at the Phuket International Airport (above) and the TSD1000 in the Philippines for local road resurfacing works.

Doka forms new landmark in Singapore

South Beach in Singapore is a new, iconic residential and office building complex with shopping and entertainment attractions, initiated by City Developments Ltd and IOS Group. Two highrises are being built as part of the project - after completion, the North Tower will feature more than 30, the South Tower more than 40 floors and offer space for offices, luxury apartments, a designer hotel and shops.

Hyundai Engineering & Construction Co Ltd was awarded the building contract and required the lowest-possible use of manpower during the in-situ construction. The solution provided by Doka includes high-performing, self-climbing units, flexible formwork systems and facilities ensuring the safety of the construction crew.

The automatic climbing formwork saves on crane use and minimises the requirement for personnel. It also helps in keeping system utilisation time low and thereby costs as well. The building core is erected using the Xclimb 60 automatic climbing formwork and Top 50 large-area formwork - the latter offers flexibility in adapting to the column and wall design.

In addition, the SKE100 hydraulic automatic climbing formwork will raise the concrete placing boom, thus eliminating the need for a crane. The Xclimb 60 protection screen that is integrated into the exterior wall protects workers. It also offers construction progress that is not restricted by wind and weather.

Pre-assembled Dokamatic tables are planned for pouring the floor slabs. The table lifting system (TLS) takes care of raising the table formwork. As a result, unproductive wait-times are eliminated and site logistics optimised. The individual floors are poured on seven-day cycles.

This expectation for ultimate adaptability is met by the Staxo 40 load-bearing tower. This in large part because the adjustable U-heads and feet of the screw jacks with 75 cm extension range allow for quick and easy adjustment to the exact height.

Doka was involved as early as during the planning phase, providing recommendations for implementation as well as selection of efficient formwork system. A Doka formwork instructor was present for on-site assembly support and instruction of the construction crew in correct handling.

The innovative design of the projecting roof for climate control resulted in two 'Green Mark Platinum Awards' for South Beach thus far. This micro-climatic feature extends along the entire building project and looks like a sail providing protection from insolation. Integrated photovoltaic cells convert solar energy into electricity. Furthermore, well insulated glass facades absorb heat while the Sky Gardens promote thermal balancing. These and other investments in sustainability make South Beach a flagship for sustainable construction in Singapore.

The groundbreaking ceremony took place in December 2011, with formwork jobs projected to continue until year-end 2014. Completion of the entire project is scheduled for 2016. ■

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Left: The North and South Tower are part of the new South Beach Project in Singapore, a complex comprising office and residential spaces and a shopping mall.

Right: The Top 50 large-area formwork is used to form the slanted columns.

Grove excels on Ichthys LNG project in northern Australia

Australian crane rental giant Universal Cranes has sent two 120 t Grove RT9130E-2 rough-terrain cranes to work on the Ichthys LNG project, which is believed to be the largest construction site ever seen in Australia's Northern Territory. The cranes arrived at the job site in early 2014, having travelled more than 3,500 km across the country, and are planned to stay for at least two years working for specialist contractor Leighton Contractors.

The Grove RT9130E-2 cranes are installing an underground network of piping and equipment at the plant. Both cranes often work with their full 48 m boom and also regularly showcase their excellent pick-and-carry capabilities. This enables operators to perform more lifts from one spot, saving time and hassle. The cranes are used almost all day, every day to keep the project on its ambitious schedule.

Working at a location where relative humidity regularly reaches 83 percent and a month's rainfall hits more than 420 mm, Grove's Full Vision cab is among the coolest and driest places to be on site. As well as contending with the weather, the Grove cranes must manoeuvre around the complex project, which already has expensive equipment and piping in place as construction continues. But with four-steering modes, superior ground clearance and excellent visibility from the cab, the RT9130E-2 cranes navigate the site with ease.

Building a mega complex in a remote, desert-like, coastal location tests the quality of all of the equipment used on site. Grove's RT cranes are known for their extremely rugged design, with deep box section frames, but they must also be regularly maintained to ensure optimum performance. Local company Darwin Crane and Machinery Services handles all servicing and repair work.

Now more than 50 percent complete, the Ichthys LNG project rolls three mega projects into one: an off-shore facility, an on-shore LNG plant and an 889 km gas pipeline. The total project cost is estimated at more than A$10 billion. Ichthys is being managed by a joint venture between main contractors GC Corporation, KBR and Chiyoda Corporation. ■

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Left and below: The Grove RT9130E-2 cranes are currently working on the Ichthys LNG project. They are used almost all day, every day to keep the project on its ambitious schedule.

Hobas XXL tank DN 3600 protects Polish city against floods

The city of Dąbrowa Górnicza in Poland is investing in a number of large-scale projects; one of them is the modernisation of a local stormwater drainage system and the construction of a HOBAS retention system. The project was implemented due to the poor technical condition of the network and insufficient capacity of the existing stormwater sewer during heavy rain. To prevent floods, a complete rehabilitation of the sewage and stormwater system was chosen. During heavy rainfalls, the excess water would be discharged into a stormwater retention tank and then gradually pumped out. The very limited space on site ruled out the alternative option of a second sewer.

To suit the local requirements at the junction of Ulica Przemysłowa street and Ulica Majakowskiego street, HOBAS designed the underground storage tank with a capacity of 2,410 cu m. The reservoir is made of four 62 m rows of HOBAS GRP pipes DN 3600, shafts, as well as bends with in- and outlet pipes and channels. The individual elements were jointed with HOBAS FW Couplings (FWC) and two assembly couplings were selected to close the reservoir. Thanks to the HOBAS GRP pipes' small outside diameter in relation to the inside diameter, the installation area could be reduced considerably – a factor which, given the location of the building site at the crossroad, proved very beneficial. A ventilation system with PVC pipes was laminated to the GRP pipes by HOBAS.

The project also includes a pumping station with two pumps to discharge the rainwater accumulated in the tank. The two pumps are an integral part of the tank and located in a shaft DN 2000. They operate periodically, depending on the precipitation intensity. Assuming a performance of the pumping station of 30 l/sec, it takes about 22 hours to drain the tank. The installation of the tank was finished after merely one month at the end of June 2014.

The described storage system is part of a new stormwater drainage system, which is currently being built from HOBAS pipes DN 400-1400, PN 1, SN 10000. The installation of the sewers commenced in February 2014 and is expected to continue until the end of 2014. HOBAS Poland produced the required GRP pipes, fittings and shafts. Due to the large size of the fittings, the deliveries took place at night. ■

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All images: To suit the local requirements at the junction of Ulica Przemysłowa street and Ulica Majakowskiego street, HOBAS designed the underground storage tank with a capacity of 2,410 cu m. The reservoir is made of four 62 m rows of HOBAS GRP pipes DN 3600, shafts, as well as bends with in- and outlet pipes and channels.

Sennebogen hard at work on Sentosa Gateway Tunnel project

A Sennebogen 690 HD duty cycle crawler crane is currently working at the construction of Sentosa Gateway Tunnel in Singapore. The crane is used by Tuksu Engineering & Construction to lift various materials on the site - bundles of steel, formwork materials and accessories for foundation pilings, are all loaded and distributed to the respective construction sections.

Equipped with a 447 kW diesel engine and two powerful winches, with a 20 t and 25 t tensile load respectively, the 690 HD can lift heavy loads up to 90 t. For the operator, the comfortable Maxcab with a sliding door offers an ideal working condition and a pleasant work environment thanks to the air conditioning system and excellent all-round view.

However, the HD duty cycle crawler crane does more than just lifting; very heavy attachments, such as diaphragm wall grabs and casing machines can be operated safely and reliably with the extensive hydraulic capacity, thanks to the robust design.

A Sennebogen 690 HD at the construction of Sentosa Gateway Tunnel in Singapore.

All maintenance points and components are also easily accessible and extremely robust in design. Sennebogen's local sales and service partner, Aly Energy, handles the regular service. ■

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FUTURE BY DESIGN

The aesthetic appearance of construction machinery is immediately recognisable, but to a casual observer the technical thought-process that influences their designs can be overlooked. The industrial designers behind the upcoming machines produced by Chinese construction manufacturer LiuGong shared their insights into the considerations impacting the current process in construction machinery design, and what might lie ahead in the future.

Legislative changes, the safety and comfort of operators and the continuous development of new technologies make the visual design of construction equipment a complex and intellectually challenging endeavour.

"Today's end-user is far more design savvy than their predecessors so aesthetics is a hugely important factor," said Gary Major, director of industrial design at LiuGong. "If something looks right, looks trustworthy, a little spark in the back of their brain immediately tells them it is going to be a good purchase."

For a construction manufacturer attempting to succeed amongst a plethora of alternatives, differentiating the machines from its competitors can be difficult, but the influence of a tight-knit, in-house industrial design team such as LiuGong's can be a defining factor before mechanical specifications even enter the equation.

"Consultancies can have a high turnover of staff so the consistency in the development of the form language can be a little uneven," explained Mr Major. "But establishing a consistent brand identity is extremely important – often the end user will want to tag a machine with their company's branding, usually at the expense of the OEM branding the machine leaves the factory with.

"Our own approach is already giving rise to LiuGong's aesthetic evolution – in other words, the DNA will permeate every design and each machine's lineage will be so obvious that you could trace its family tree," added Mr Major. "Solid form language and strong DNA can communicate the marque just as effectively as a set of decals – when was the last time you needed to see a badge before recognising a Mercedes-Benz or Aston Martin?"

Succeeding with this differentiation must take more into account than originality and consistency alone; the ability to influence a positive emotional response with the end user is one of an industrial designer's most

Above and below: The challenge in defining any construction machine with a unique identity stems from the varying specifications that must be adhered to, be it as a result of engineering or regulatory demand, explained LiuGong.

"TODAY'S END-USER IS FAR MORE DESIGN SAVVY THAN THEIR PREDECESSORS SO AESTHETICS IS A HUGELY IMPORTANT FACTOR."

powerful weapons. "The perception of quality will help to sell a machine," said Richard Killgren, senior industrial designer at LiuGong, who had spent years in the automotive industry with Lotus and Bentley, and is now transferring his skills to LiuGong's machine development. "When you make contact with a machine, be it from a visual or on a tactile basis, if anything looks or feels cheap you assume the whole machine is inferior on an emotional level, irrespective of its specifications and usability. The impact of emotional triggers from a design perspective can never be underestimated."

Mr Major added, "As people, we are often unaware of the subconscious emotional tendencies that influence our decisions. This could even be as subtle as the colour balance between yellow and dark grey on a construction machine, which is easily relatable on an emotional level to examples in the natural world – think about the different ways you would react to a canary and a wasp.

"These things are second nature to us now – it's one of the first things we look at when we see a machine, and acts as an overarching initiative in every LiuGong machine we design."

The challenge in defining any construction machine with a unique identity stems from the varying specifications that must be adhered to, be it as a result of engineering or regulatory demands.

Mr Major highlighted an example relating specifically to the ever-growing legislative demands. The gradual progression towards the energy-efficient Tier IV Final EU emissions standards has had as much an influence on the design of construction machines as it has mechanically.

"One golden rule around five years ago was that an operator needed to be able to see an object one metre high from one metre away from the machine," said Mr Major. "Engine emissions have changed components such as powertrains and the particulate filter assembly, growing their size enormously. Because of that, engine enclosures are now huge which creates challenges in meeting sightline requirements, which in turn impacts the overall aesthetics."

Continued overleaf...

These challenges however, can be offset by the continuous development of new technologies – an area which LiuGong is actively researching and incorporating into its designs: "Developments in materials – especially in the area of composites – have allowed us greater freedom to explore form, and the increased aesthetic awareness from the end user has allowed us to push for bolder designs," said Mr Major.

"From a visual standpoint, the better the A-surface, the better the machine looks," he elaborated. "Up until now, an awful lot machines in this category used pressed steel; when you do pressed steel on a car, because you're working with a very thin gauge of material, you can get the sleek detailing that you would generally associate with a car's body.

"With construction bodywork, we are talking about 2, 3, 4 mm thick steel at times, so to get that level of definition has been very difficult. With composite technologies and the likes of injection moulding, it is considerably easier to attain the style of A-surface we want for future generations of LiuGong machines."

The benefits of the advances in composite technology span further than widening the stylistic freedom a designer has too, as Mr Major explained, "From a performance point of view, the materials we are looking at have an extremely high impact resistance. For example with hoods, there will inevitably be a considerable amount of spoil and rock landing on the machine – pressed steel machines dent rather easily as a result.

"With contemporary composites, quite often the materials will bounce off and there will be no visible damage at all. Certain materials can also be self-coloured within the mould, so if a machine is subject to high levels of abrasion, the colour is not going to scratch off like paint would. As a result of all this, these higher grade materials help the machine to age better, both in terms of maintaining visual appeal and minimalising potential damage."

The value of new technologies enhances the design, as well as energy and operational efficiency, but LiuGong's industrial design team still places great emphasis on the end-user. For example, in addition to a highly accomplished engineering background, Ed Wagner, LiuGong's director of new technology and director of test brings thousands of hours of operating various types of equipment in heavy highway construction.

"It is much more important to acquire knowledge directly, through experience or observations, than through questionnaires or other sources of secondary feedback," explained Mr Wagner. "Identifying the benefits these technologies have for the end user is indispensible information for us during the design process – that's why LiuGong has operators within our large test organisation, and why we constantly seek feedback from actual customers who trial run our prototype machines."

Above: The value of new technologies enhances the design, as well as energy and operational efficiency, but LiuGong still places great emphasis on the end-user.

Left: LiuGong's industrial design team at bauma China 2014. Shown in this picture are (from left) Jamie Holmes, Gary Major, Richard Killgren and Ed Wagner. Behind them is the 856H wheel loader, one of LiuGong's latest generation H-series machines.

One area that demonstrates how new technologies can enhance this synergy of machine design, efficiency and operator ergonomics, is in the cab. "Operator enclosures will become far nicer spaces in which to work – fully climate controlled with superb all-round visibility, pressurised for cleanliness and utterly intuitive to interface with," explained Mr Major. "In the future, gesture control systems will likely take much of the difficulty out of driving these vehicles – for example, an operator could interact with the machine by wearing a glove with monitors in. He would use his hand to describe what movement he wants to action from the machine.

"There is a lot of research going on into that side of the industry – we're not quite there yet, but it seems an inevitable evolution and one that we at LiuGong are very much engrossed in because of the avenues of creativity it opens for the design team."

As technologies catch up with the direction of regulatory demands, the potential impact on both the performance and aesthetic design of construction machines will be significant.

Mr Major concluded, "From a design perspective, my hope is that restrictions on the traditional internal combustion drives will lead to a push towards more exotic hybrid drive systems – that will help to shrink the package's bodywork and give us greater creative freedom.

"Likewise, technologies cascading toward the construction industry like battery technology and energy recovery systems – be it an influence from the automotive industry, military or technological test-beds like Formula 1 – means that construction machinery design has a very exciting future." ■

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WORLD PREMIERE AT LIEBHERR

Liebherr has developed a new series of telescopic handlers and expanded the range of Generation 6 crawler tractors. Southeast Asia Construction travelled to Telfs, Austria, to witness first-hand the world premiere of these machines.

Telescopic handlers

Liebherr's new telescopic handler models with a 7 m lifting height have been designed to meet the demand from the construction industry and equipment hire. They include TL 432-7 with a lifting capacity of 3.2 t, TL 436-7 with a lifting capacity of 3.6 t and TL 441-7 with a lifting capacity of 4.1 t.

These new telescopic handlers are powered by a 74 kW turbocharged Deutz construction machine engine, which is equipped with an oxidisation catalyst and meets the requirements of the IIIB/Tier 4i emissions legislation. For deployment on steep gradients where a higher pulling force is needed, Liebherr offers a larger capacity engine with an output of 90 kW and a greater hydraulic delivery rate.

The hydrostatically driven fan is regulated electronically and the cooling output is set variably depending on the ambient temperature and operating conditions. This enables a fuel saving operation; noise emission can also be reduced and general efficiency during operation is increased.

The telescopic handlers show good stability when loading and lifting. The newly designed frame and the balanced wheelbase give the machines a low centre of gravity. The heavy duty telescopic boom is articulated at a point deep in the frame. Powerful friction bearings allow smooth guidance with heavy loads and offer a high lifting force.

High performing working hydraulics and the hydrostatic travel drive on the telescopic handlers facilitate purposeful and fast operations as well as short working cycles. The infinitely variable controls and the fine response of the hydrostatic travel drive ensure precision and rapid manoeuvring and also jolt-free driving without shifting operations across the entire speed range.

Above: The new Liebherr telescopic handlers show good stability during loading and lifting. The newly designed frame and the balanced wheelbase give the machines a low centre of gravity.

Left: For the comfort and safety of the driver, the cab has been generously sized with ergonomic control elements.

The rims and axles designed specifically for the equipment - the 45 percent self-locking limited slip differential on the front axle and the particularly wide swing angle of the rear axle (not forgetting the high ground clearance) - guarantee safe work and good off road capability. The compact machines are ideally suited for use in tight operating conditions, thanks to their excellent manoeuvrability.

Three different types of steering – front wheel steering, all-wheel steering and crab steering – can be individually selected. A standard LED display informs the driver when the wheels are in a neutral position.

For the comfort and safety of the driver, the cab has been generously sized with ergonomic control elements. Large window panes, an uninterrupted windscreen, a newly designed driver console as well as the standard tilting steering column and low articulation point of the boom ensure all-round visibility.

The single lever operation means that the telescopic handlers can be controlled with high precision. Moreover, the travelling direction switch integrated in the joystick makes it possible to change between forwards and reverse travel quickly and easily.

The machines are ideal for use in tight operating conditions, thanks to their excellent manoeuvrability.

Maintenance is simple due to easily accessible servicing points for the diesel engine and hydraulic system.

The acoustic and visual overload warning system provides continuous feedback to the driver about the current load situation of the machine. The standard load torque limiter also automatically regulates the speed of the working hydraulics and thereby facilitates a safe approach to the maximum rated load. In the event of overload, the functions that would otherwise lead to the machine tipping over are blocked. Only movements that allow the equipment to be moved back to the safe working range are then possible.

The standard end position damper for lifting, lowering and telescopic retraction as well as the pipe breakage protection in the hydraulic cylinders makes it possible to move the load with a high level of safety. The automatic parking brake prevents the machine from rolling away unintentionally on gradients.

The optimal interaction of hydrostatic travel drive and diesel engine allows fuel savings to be gained, particularly in operations where the direction of travel has to be changed frequently. Furthermore, easily accessible servicing points for the diesel engine and hydraulic system, as well as an optional central lubrication system including telescopic head, reduce the maintenance complexity to a minimum.

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The heavy duty telescopic boom is articulated at a point deep in the frame, and powerful friction bearings allow smooth guidance with heavy loads and offer a high lifting force.

Generation 6 crawler tractors

Liebherr's Generation 6 crawler tractors include the PR 746 Litronic and PR 756 Litronic. The PR 746 Litronic offers an operating weight of 28,900 to 30,800 kg with a 185 kW Liebherr diesel engine. The largest of the new Generation 6 crawler tractors, the PR 756 has an operating weight of 38,300 to 41,150 kg and an engine output of 250 kW.

The machines are powered by six-cylinder Liebherr diesel engines that comply with the stage IV/Tier 4f emissions standards. In order for the requisite emissions and consumption targets to be fulfilled, Liebherr has optimised the entire combustion process and reduced the particulates within the engine to a minimum. For ideal adaptation of the various parameters, support is provided by the development of an in-house common rail injection system including an in-house electronic engine management system.

To simplify the system and optimise exhaust gas after treatment for challenging operations, selective catalytic reduction (SCR) technology and thereby a diluted urea solution, e.g. Ad Blue, are employed. The efficient combustion in turn facilitates lower fuel consumption and provides economical benefits to the customer.

The Generation 6 crawler tractors feature a newly developed, electronically controlled drive management with integrated ECO function. This enables the driver to choose between high performance and maximum economy. Compared with the previous generation, the ECO control system ensures more efficient operation of the travel drive for light to medium-heavy operations.

Above: The Liebherr PR 756 Litronic crawler tractor has an operating weight of 38,300 to 41,150 kg and an engine output of 250 kW.

Left: The PR 746 Litronic features an operating weight of 28,900 to 30,800 kg with a 185 kW Liebherr diesel engine.

Crawler tractors are manufactured at Liebherr's factory in Telfs, Austria. The facility covers an area of 170,000 sq m and currently employs about 470 people.

Another new feature of the machines is the proactive power control. In this instance, both internal engine parameters and external machine parameters are detected, such as the current degree of drive joystick deflection, resulting in engine performance being elevated automatically for a short period to match the current demand. As well as responding more rapidly, the machines offer a tangible increase in performance potential and pulling power.

The hydrostatic drive keeps the engine speed at a constant level. All of the drive components and the intelligent Liebherr engine management are harmonised optimally to each other. The Liebherr travel drive is distinguished by a high level of efficiency and low fuel consumption.

To simplify the use of automatic machine control systems, Liebherr supplies ex-factory preparation kits for leading manufacturers' systems; these kits are also available for

Generation 6 models. This makes it much easier to install 2D and 3D control systems and affords the operator the highest level of flexibility in choosing the system.

The combined inch brake pedal installed on the machines makes it easier to switch from conventionally driven machines to the new Liebherr Generation 6 crawler tractors, because the braking function of the hydrostatic travel drive can also be activated with the foot pedal as well as with the joystick. An optimal enhancement to this is the three-stage drive joystick (forward, stop and reverse positions), which is available as an option.

The modern design of the new Generation 6 crawler tractors, with falling edges on all sides and uninterrupted panoramic glass pane, offers the driver an optimal all-round view of the terrain as well as the blade and rear ripper. The view over the engine cover is not hindered by the exhaust system and rams as these have been positioned behind the A-pillar. A good all-round view can lead to efficient work and increase safety in daily use.

The driver cab has been newly designed. The new drive controls can be moved longitudinally to the most ergonomic position for the driver and, with the new T-shape, allow more ergonomic handling and thereby more comfort. The desired travelling speed range can be preselected directly on the joystick. In this way, control of the tractor can be apportioned precisely, especially at low speed. Driver detection takes place automatically by means of the integrated seat contact switch without a safety lever having to be actuated.

All tractors of the new Generation 6 are equipped with the touch-sensitive system display for Liebherr earthmoving machines. This allows important operating parameters such as the ECO function and convenience functions such as the air conditioning system to be operated intuitively with a clear overview.

The Generation 6 Liebherr crawler tractors feature a newly developed, electronically controlled drive management with integrated ECO function. This enables the driver to choose between high performance and maximum economy.

For optimal illumination of the working area, modern lights such as high performance LEDs are available depending on the chosen equipment level. The modular lighting concept is an element of the

Continued overleaf...

new machine design and makes it possible for the lighting to be adapted optimally for the respective use.

Centralised servicing points, wide-opening access flaps and engine compartment doors, a driver cab that tilts and fans that fold out for cleaning (optional on engine side) facilitate excellent service access and simplify the maintenance process. The replacement intervals for the hydraulic fluid on new models can be up to 8,000 operating hours, depending on deployment and with regular quality checks.

The running gear of both crawler tractors has been completely redeveloped. The considerably larger diameter of the split sprocket wheel with more teeth in engagement extends the service life of the bushes and sprockets.

For the PR 756 Litronic, there is a pendulum chassis available as an option. This makes it possible to adapt the track rollers flexibly to the ground. In particularly rocky terrain, the pulling force to be transmitted and the machine's smooth running properties are thereby significantly increased. Unevenness on the ground is ironed out through the elastic suspension and impact loads are reduced to a minimum. This increases not only the service life of the chassis but also protects the whole machine against damage.

The Liebherr fleet management system, LiDAT, provides detailed information about the machine's operation and allows it to be managed efficiently, optimises planning and enables remote monitoring. Depending on the subscription, the details are updated several times a day and can be called up whenever needed in a web browser. An automatic alarm function can also be set up if a machine leaves a predetermined zone, for example, or if a critical operating situation arises.

New spare parts logistics centre

In another development, Liebherr has established a new logistics centre in Oberopfingen, Germany. From early 2015, this will be the base from which spare parts for Liebherr earthmoving machinery will be supplied around the world. In the long term, spare parts logistics for additional construction machinery will also find its home here. The investment value for the first stage of construction is in excess of €115 million.

The first phase of the building is set to be completed at the end of 2014. This construction phase covers a site development, the erection of a logistics warehouse over an area of approximately 47,000 sq m and the construction of a separate office building. Commissioning of the logistics area is expected to take place in the first quarter of 2015.

The final extension phase will include a site measuring 360,000 sq m, a warehouse space of about 170,000 sq m and an office building covering 4,500 sq m. A future concept specifically planned for spare parts logistics makes allowance for an additional space directly next to the new logistics centre of 47,000 sq m to mirror the new logistics warehouse.

The site is located in the municipality of Kirchdorf an der Iller, to the south of Oberopfingen, offering direct access to the federal motorway 7 via highway 312. It is also quite central in relation to the large Liebherr production facilities for construction machines in south Germany, Austria and France. Liebherr said that aside from the good road connection, further expansion of the available area was a contributory factor during selection of the site. ■

Top: From early 2015, the new logistics centre in Oberopfingen, Germany, will be the base from which spare parts for Liebherr earthmoving machinery will be supplied around the world.

Middle: Manual warehouse area and automatic dispatch at the logistics centre.

Bottom: Preliminary commissioning zone for automatic shelving system at the logistics centre.

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'SE ASIA IS IMPORTANT TO OUR GROWTH'

Terex Aerial Work Platforms (Terex AWP) recently had a celebration to mark both the official opening of its new Singapore office and the arrival of its tallest self-propelled telescopic boom lift, Genie SX-180. Southeast Asia Construction was in attendance during the event and spoke with the company's key executives about the new facility and the future of aerial platforms in the region.

Congratulations to Terex AWP on this special occasion. Making the transition towards a regional-based organisation is certainly a milestone. Besides having an expanded team, you are also now located in a new, larger facility together with the other two Terex business segments. How is everything going so far?

Mike Davis (MD): So far, so good. It is still in the early stages, but the strategy definitely works for us. Not only do customers have direct access to our local team members, it also makes things more efficient internally as we are not depending on our home office in the US. And now that we're here, you'll see us grow quickly.

We have adopted this approach in Europe, and it's been successful. It is the same strategy that we are implementing in Asia Pacific – as a start, we've already built a factory in China to serve the market.

Daniel Ho (DH): When the three business segments were located separately, it was very difficult to bring them together. Now we are much stronger under one roof. Mike's presence in this region is important; being one of the senior executives, he plays a major role in getting the synergy of these various business segments.

Sharon Foong (SF): Having an expanded team and facility also means that we can now offer customers a complete sales, parts and aftermarket support.

Mr Davis, you mentioned before that the aerial platform industry in Southeast Asia has been growing at its fastest rate for the last few years, in comparison to other regions. What do you think the reason for this success?

MD: Firstly, safety awareness on the jobsite has been improving in Southeast Asia, especially when working at height. In some countries in the region, the labour cost is also increasing. Because of these reasons, more and more companies here are using aerial platforms instead of the traditional systems. The Southeast Asian market has contributed significantly to our growth.

Singapore is a great example where workplace safety requirements have successfully progressed over time. In addition, the government is actively promoting worksite productivity and encouraging more projects to use productive construction equipment and technologies. As a result, demand for aerial platforms in Singapore has risen so much during the past years. And our new Genie SX-180 boom lift is expected to be popular in this country for this reason.

But beyond safety, our dealers in the region have really helped to drive the growth of the industry. Their willingness to invest and develop their customers' understanding of aerial products has been critical to all of our success so far. And of course their continued drive to develop new markets and channels for our products will be the key to the future of our industry.

Could you share with us the challenges you face in Southeast Asia?

MD: In general, lack of proper safety regulations is still a major challenge in Asia, including Southeast Asia. It is part of our job to

From left: Sharon Foong, general manager for Southeast Asia; Mike Davis, managing director for Asia Pacific; and Daniel Ho, vice president for Asia.

Terex AWP shares its new office with two other Terex business segments - Terex Cranes and Terex Material Handling and Port Solutions (Terex MHPS).

Terex AWP's new facility includes an expanded workshop and warehouse.

continue educating customers on this issue. We also work closely with many government authorities across the region. At the end of the day, unless the government is driving safety, it would be very hard to get the industry to take it on by itself – because it is a complex issue and there's a lot of financial burdens.

DH: Nevertheless, Asia is getting better at safety. I've seen some positive changes in major markets like China and India; it was a different story 10 years ago.

MD: The health of the rental sector should also be taken into account. In order for the aerial platform industry to take off, the rental sector has to grow as well. In some Asian countries, like India, the rental industry is relatively new, making it hard for the aerial platform industry to develop.

Nowadays, every major OEM seems to enter Myanmar. It has been called 'the last frontier' of Southeast Asia. What is your view on this market?

SF: We are optimistic about Myanmar. The country is just opening up, so the growth of the aerial platform industry there will take some time. Many construction workers still use the scaffolding system on jobsites. They're just starting to learn about aerial platforms and it is also our job to educate them.

With the aerial platform industry currently booming in Southeast Asia, would you consider acquiring a local company to expand your product portfolio in the region?

MD: When the right opportunity comes and presents itself, why not. There is not a definitive no; if we see a business that is better off with us and it makes sense, we might do it. But in the meantime, we want to focus on developing new products to meet our customers' needs and strengthen our dealer network in the region. ■

More details on the Genie SX-180 boom lift can be read in the November/December 2014 issue of Southeast Asia Construction.

The Genie SX-180 self-propelled telescopic boom lift has a 54.9 m vertical reach and 24.4 m horizontal reach, with a maximum working height of 57 m.

Some of Terex AWP team members and customers get together at the event.

AVER ASIA TAKES DELIVERY OF FIRST GENIE SX-180 IN SOUTHEAST ASIA

The event also saw the official handover of the first Genie SX-180 self-propelled telescopic boom lift in Southeast Asia to Aver Asia (S) Pte Ltd, an authorised distributor for Genie products based in Singapore.

Ben Koh, general manager of Aver Asia, said that the Genie SX-180 boom lift is ideal for high-rise projects currently taking place in Singapore. "We can also use it in the oil and gas industry, such as LNG plants," he added.

Mr Koh further highlighted that "Singapore is very strict in terms of safety requirements for working at heights, and this is another reason why we bought the Genie SX-180."

The Genie SX-180 boom lift has a maximum working height of 57 m, with a 54.9 m vertical reach and 24.4 m horizontal reach. The 3.05 m, 135° (vertical) and 60° (horizontal) rotating jib positions workers and gear exactly where they are needed. In addition, the 2.44 m wide by 0.91 m long platform has an unrestricted capacity of 340 kg. The new, patented XChassis system can extend and retract the axles to provide both stability on the job and a narrow profile for transport. Furthermore, featuring a stowed length of 12.98 m, the 24,948 kg machine requires no over width or over height permits allowing it to be easily transported on a truck. ■

Mr Davis officially hands over the Genie SX-180 to Ben Koh, general manager of Aver Asia (S) Pte Ltd.

The Everlasting Vintage

The Victoria Theatre and Concert Hall restoration project in Singapore has recently been completed. Located in the country's civic district spanning over 14,000 sq m, the entire complex was gazetted a National Monument in 1992.

It was designed by Municipal engineer John Bennett during the era of Victorian Revivalism. The influence of the period can be seen reflected in its design, which includes features like Italianate windows and rusticated columns. The foundation of the complex was first laid down in 1862, and officially inaugurated by the governor of the Straits Settlements, John Anderson, on 18 October 1905.

Since its inception, Victoria Theatre has been the chosen venue for some of Singapore's most prestigious cultural events like the Singapore Arts Festival, Singapore Sun Festival and weekly performances by the Singapore Symphony Orchestra.

The historic complex comprises two buildings and a clock tower joined together. Both buildings were closed for major refurbishment in 2010. T.Y. Lin International Pte Ltd was commissioned to carry out the civil and structural (C&S) as well as mechanical and electrical (M&E) design services of the project for the National Arts Council (NAC).

Restoration works

T.Y. Lin, working in conjunction with NAC, developed a preservation scheme to overcome technical challenges associated with protecting the aesthetic features of the heritage structure and upgrading it to modern day standards.

Above, all images: The Victoria Theatre and Concert Hall is a historic complex that includes two buildings and a clock tower joined together.

Restoration of the complex included the excavation and construction of two basement levels within the conserved theatre facade walls that were founded on shallow brick pedestals. One of the key structural challenges in delivering the restoration works was to underpin part of the theatre facade wall to enable the basement structure to extend under the Old Parliament Lane and the Atrium area. The old foundations of the conserved structures were strengthened in order to transform both spaces into modern facilities to cater for world class performances.

To provide a column-free foyer space, four pairs of existing columns within the Concert Hall that were added during the previous renovation were removed and two pairs of steel columns concealed in the conserved load bearing walls were introduced. The additional loads of the new spiral staircase and platform located just above the foyer and the circle seats structure are suspended from steel trusses by the hangers.

The team was creative, flexible and innovative in developing the design with the objective of accommodating to the acoustic demands of different noise criterion for the theatre and concert hall. To bring the heritage structure in line with modern day standards demanded the introduction of modern fire protection, smoke extraction and air-conditioning systems under the preservation scheme. Focusing heavily on standards and quality, the team successfully introduced modern technology and equipment into the heritage structure despite tight space constraints. ■




Above, all images: The complex under restoration.

30B PHILLIP STREET

Well known for its richly ornamented roof, vibrant wall reliefs and frescoes outside and within its walls, the Yueh Hai Ching Temple built in the 1820s has been restored to articulate detail showing deep respect for the monument's architectural roots. This stunning restoration demonstrates thoughtful choices informed by extensive archival research and technical consultation with local and overseas architectural experts and temple craftsmen. It has also received the Award of Merit in the annual UNESCO Asia-Pacific Heritage Awards for Cultural Heritage Conservation.

The methodology for restoration was clearly well thought through and executed. After a thorough search in Guangzhou, China, the project team engaged a Class 1 contractor with a team of master craftsmen seasoned in a wide range of trades, from ceramics to timber structures, timber carvings, frescoes and gold gilding. Sketches, measured drawings and photographs were compiled to document the existing architecture.

The project team stayed faithful to the 3R principle from start to finish. With the 'top-down' approach, a temporary roof was erected over the temple to protect it during the restoration works. Great care and attention to detail were demonstrated in the repair of the beams and structures, and the retention of the granite floor slabs at the front courtyard.

© URA

Past renovations which obscured the original character of the temple were removed. Using authentic materials, traditional techniques and sensitive construction method, every part of the temple was restored. Laudable examples include the reconstruction of the boundary walls based on archival photographs, the repainting of life-size door gods in true multi-chromatic Teochew style, and the reinstatement of the colourful dragon and tiger sculptural wall relief panels within the temple.

Of outstanding excellence is the exquisite detailing that revitalises the intricate three-dimensional ceramic ornamentations on the spectacularly adorned roof and internal and external walls. Once again, the dioramas depicting Chinese folklore and classical stories come alive in the most densely decorated Chinese temple in Singapore. These captivating works of art have been meticulously recreated piece-by-piece in the experienced hands of professional artisans.

The traditional 'bao hu' mixture of hydraulic lime was used on the roof, while ash from burning shells was used as the bonding substance on the decorative porcelain. The team applied a chemical protective layer to the relief paintings on the upper panels of the front facade before painting. This ensures that the original paint layer can be recovered should the new paint layer be removed in the future. The plaster relief on the lower panels was reinstated. ■

Project Team

Owner: The Ngee Ann Kongsi
Architect: Raymond Woo & Associates Architects
Conservation Consultant: Laborans
Engineer: Chong & Lee Consultants
Specialist Contractor: Shantou Ji Chuanying Ancient Construction and Decoration Designing Co Ltd

2,4,6,8 AND 10 TOWNSHEND ROAD

This boutique hotel project has enhanced the qualities of five conserved two-storey shophouses and added a new six-storey tower to the neighbourhood skyline. The outcome is understated yet tasteful, and makes a considered and positive contribution to the surrounding streetscape.

Adhering to the 'top-down' approach, the project team started work by replacing the original roofs of the Transitional-style shophouses which were found to be unsalvageable. The pitch roof structure was retained while damaged elements like the timber rafters and battens and original clay tiles were replaced. To update the building to suit its new purpose as a hotel, insulation was added at the roof and jackroofs were incorporated to allow light into the attic spaces.

While the main structures including the front columns and party walls were in good condition, the team did well in sensitively repairing damaged, and replacing missing elements and features like windows, balustrades and pre-cast vents of the shophouses. At the first storey, the wall is recessed for a 'mama store' to recall the past.

Through good design integration, the rear modern extension complements the linework and colour scheme of the conserved portion to give a unified development on the prominent site at a road junction. The minimalist-style straight lines introduced via the hotel tower's windows and grilles clearly reflect the horizontal and vertical features of the conserved building's facade. The full glass windows on the new block also echo the original French windows.

Great care was demonstrated in fitting the hotel rooms fronting the main road neatly into the existing grid of the shophouses. Potentially unsightly M&E amenities were screened away from view to preserve the aesthetics of the development and neighbourhood. Design and planning for the hotel, including meeting the requirement for barrier-free accessibility and car park lots for hotel guests, also demonstrated careful thinking and good use of materials. ■

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Project Team

Owner: Octojet Holdings Pte Ltd
Architect: SZ Architects
Engineer: Case Consultants
Contractor: LBD Engineering Pte Ltd

145 NEIL ROAD

This terrace house of Transitional style has been transformed through a series of clever interventions. Its charming vintage features have been retained as much as possible and restored.

The project team observed the approach of maximum retention and sensitive intervention to achieve its vision, both outside and inside this two-storey house. Rich and unique detailings on its facade – Chinese inscriptions and friezes adorned with ceramic chips, timber doors, windows and shutters, green Chinese awning tiles and glazed Peranakan tiles, and the red cement flooring along the five-foot way – were repaired and restored. The process to determine the original colour used for the house's facade also demonstrates good conservation practice.

The home's interior has been largely retained. Much of the upper storey timber floor joists and boards, and original elements like the window shutters in the courtyard, tiles from the former timber staircase, and

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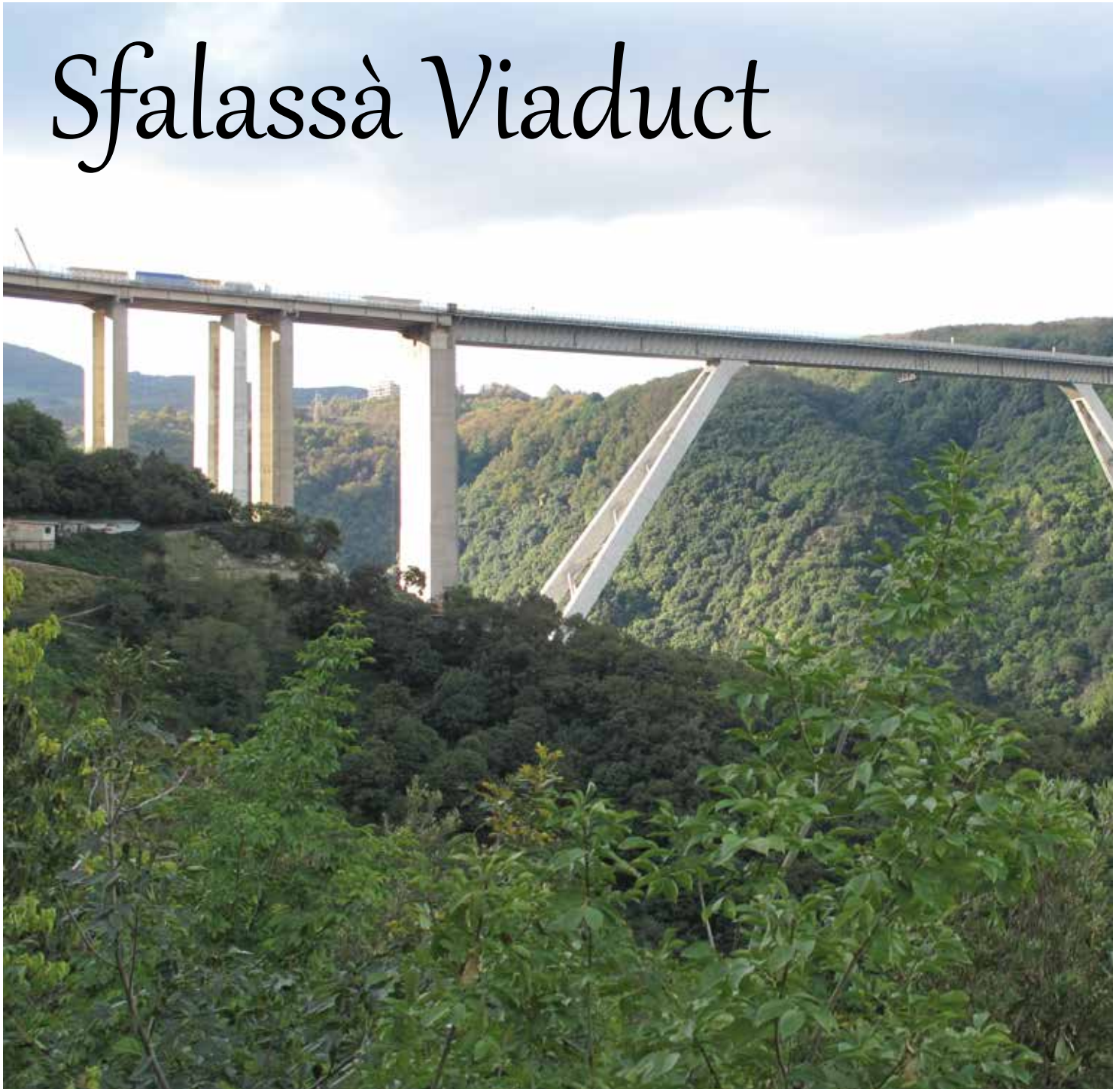
the oxidised iron-gate were repaired and reused. An original doorframe that supported a Chinese plaque made from plaster at the second storey was salvaged and now serves as a portal to the secondary staircase that leads to an attic bedroom and roof terrace. The terrazzo finish evident in the master outdoor bath and other bathroom floors shows the innovative use of an old material that is now a rarity.

The team is also lauded for retaining the first-storey terracotta floor tiles and reinstating the open-to-sky courtyard which has antiquated pigmented cement wall tiles punctuated by a fish-mould waterspout centrepiece. A water-based protective coating was also applied to the otherwise friable exposed brick walls of the original party wall that extends beyond the first storey living room to the upper quarters. ■

Project Team

Owner: Ms Ho Ren Yung
Architect: ONG&ONG Pte Ltd
Engineer: JS Tan Consultants Pte Ltd
Contractor: Sage Builders Pte Ltd

Sfalassà Viaduct



The Sfalassà Viaduct is believed to be the highest span portal arch bridge in Italy and one of the highest in Europe. It was designed by the Italian engineer Silvano Zorzi in 1967 and built between 1968 and 1972. Situated over the A3 Salerno-Reggio Calabria motorway in the southern part of the country, the bridge reaches a height of around 250 m from the bottom of the valley. It is made up of hollow concrete piers and a central 376 m long steel span resting on two inclined struts, which join to the main piles and give it its distinctive portal structure.

During 2010-2012, the Sfalassà Viaduct underwent repairs. The work was carried out on the internal and external surfaces of the third and fourth piles, each being approximately 130 m high from the base plane. It is said that these are the highest piles and, as they interact with the central frame when in service, they ensure extensive static function.

Repair work

The initial survey carried out on the bridge highlighted how various factors had contributed to the concrete deterioration. The thermal difference between the outer and inner part of the piers and the concrete shrinkage, which had been impeded by the foundation structure and by the concrete poured in several steps, have generated vertical cracks in the first 25 m of the piles. The cracks have worsened over the years and, in certain points, they have passed right through the concrete on all four sides. In addition, the bridge's proximity to the sea has caused the corrosion of the reinforcement due to the presence of chlorides.

The findings from the survey have been taken into consideration and the repair work has been designed to be carried out in various

The Sfalassà Viaduct is believed to be the highest span portal arch bridge in Italy and one of the highest in Europe.

steps. Firstly, hydro-demolition was used to remove all the deteriorated concrete. Then, structural repair work was performed on the first 30 m of the piles to restore the required concrete integrity. This was carried out by sealing the main cracks and preparing the new covering render with a structural cementitious mortar reinforced with metallic mesh.

After that, the repair of the concrete cover was carried out using a structural cementitious mortar along the entire length of the piles, apart from the first 30 m. Following this, the reinforcement was protected from corrosion in the lower and external parts of the piles by placing internal zinc anodes in

Continued overleaf...

Placing the new reinforcement on the surface after removing the deteriorated concrete by hydro-demolition.

Placing Mapeshield I 30/20 anodes in position.

Application and roughening of the first layer of Mapegrout Easy Flow.

Application of Mapelastic Guard by spray.

The article courtesy of Realtà Mapei International no. 48

order to provide the galvanic cathodic protection for the steel in the concrete. Finally, the external surfaces were protected with an elastic cementitious smoothing compound to increase the durability of the structure, including when subjected to aggressive agents such as carbonation and chlorides.

All the products used were chosen from amongst those certified according to the European standard EN 1504 'Products and systems for protecting and repairing concrete structures: definitions, requirements, quality control and conformity assessment'. This standard is a valid tool to optimise repair interventions, and offers so much more than the simple approach of removing all the deteriorated material and replacing it with another product.

Mapei was chosen to supply all the materials for the concrete repair. The Mapegrout 430 pre-blended, medium mechanical strength, thixotropic fibre-reinforced mortar was applied by spray with a rendering machine to repair the internal surfaces. This product adheres to the EN 1504 standard, part 3, for R3-class structural mortars. The internal surfaces were finished and protected with Elastocolor Paint, protective crack-bridging elastomeric coating in compliance with the EN 1504 standard, part 2, for coatings.

Galvanic cathodic protection to prevent corrosion of the reinforcement rods in the concrete was provided by using Mapeshield I pure zinc anodes. These anodes are composed of a multi-layered, zinc core with a large surface area coated with special conductive paste to keep it active over the years. After connecting the anodes to the reinforcement rods with metal stays, a difference in potential is generated between the steel and the zinc inside the cementitious material that blocks the corrosion process and impedes its formation, even in particularly aggressive, chloride-rich surroundings. In fact, when two different metals are connected together in a suitable electrolyte (concrete), the metal with the most negative potential (zinc) will corrode, while the metal with the least negative potential (steel reinforcing rods) remains protected against corrosion. The anodes ensure that the steel reinforcement is in compliance with the EN 12696 standard 'Cathodic protection of steel in concrete'. With this system it is possible to protect the reinforcing rods even when it is not possible to completely remove all the chlorides from the substrate, such as when it has penetrated too deeply into the concrete.

All the external surfaces of the piles were repaired by spraying them with Mapegrout Easy Flow pre-blended, high-strength, shrinkage-compensated, thixotropic fibre-reinforced mortar resistant to sulphates (which are also present in seawater). This type of mortar has proven to be particularly suitable for this type of application, in that it may be applied in thick layers without the use of formwork. This product also meets the minimum requirements of the EN 1504 standard, part 3, for R4-class structural mortars.

For the final protective layer, all the external surfaces were coated with spray-applied Mapelastic Guard flexible cementitious mortar. Mapelastic Guard complies with the minimum requirements of the EN 1504 standard, part 2, for coatings. ■

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The third Bosphorus Bridge will eventually connect the European and Asian continents after its completion in 2015.

3rd Bosphorus Bridge

The megacity of Istanbul, with around 15 million inhabitants, is the fourth largest city in the world. It straddles two continents and two seas, making the Turkish metropolis unique but, at the same time, it is plagued by chronic traffic problems. In particular, the two existing Bosphorus crossings from 1973 and 1988 are tremendously overloaded. The third bridge at the outlet to the Black Sea – also known as Yavuz-Sultan-Selim Bridge – is currently under construction. This new bridge is believed to have the highest concrete bridge piers in the world, and is considered to be the largest concrete suspension bridge with railway tracks in the world. As a direct connection to the planned mega-airport, it is expected to relieve the two existing bridges quite considerably. The completion of this ambitious project is planned for 2015.

The suspension bridge is supported by two A-shaped pylons and reaches a height of around 330 m, thus making it one of the highest in the world. The construction of the upper area of the two piers is being carried out in 21 concreting sections, each 4.60 m. The unique shape of the reinforced concrete pylons and the complexity of the mounted parts have required a very flexible planning process.

The 59 m wide bridge carries eight lanes and two railway tracks with a span of 1,408 m across the Bosphorus, and connects – as part of the new 260 km long North Marmara Motorway – the European and Asian continents.

Complex geometries

With the Peri ACS self-climbing system and Vario GT 24 girder wall formwork, the high requirements in terms of flexibility, surface quality and dimensional accuracy have been met. The efficient workflow processes from one level to the next has resulted in very high productivity and extremely short cycle times made possible through the hydraulic climbing system.

For the inclined surfaces of the A-shaped pylon legs, the adjustable version of the ACS V self-climbing formwork is being used. This can be optimally adapted to suit the sloping side surfaces of the pylons. In order to facilitate safe and ergonomic working conditions at great heights also on inclined structures, the working platform is always positioned horizontally. For the almost vertical surfaces, forming is carried out using the ACS R version, which is the standard system of the ACS self-climbing formwork. Within the pylon legs themselves, the ACS P platform version is being used alongside the ACS V.

A major challenge during the planning phase was to adapt the formwork solution in order to match the cross-section requirements of the four pylon legs, which steadily become narrower as they climb upwards. The construction has a triangular-shaped base structure with broken corners. Over the height of the pylon, the three long

One of the challenges is adapting the formwork to the changing dimensions and positioning of the steel mounting parts for guiding the stay cables. The complete solution from Peri meets the strict requirements regarding high flexibility and dimensional accuracy.

The third Bosphorus Bridge is believed to have the highest concrete bridge piers in the world. It is also said to be the world's largest concrete suspension bridge with railway tracks.

polygon sides are reduced by 1.40 m respectively. The required adjustment of the working platforms has taken place by means of centrally positioned filler platforms whose supporting surfaces are easily adapted to the outer neighbouring platforms. The formwork adjustments are realised using compensation plates and bolted filler elements, which are gradually dismantled accordingly.

In addition, the Peri self-climbing solution provides, in particular, the flexibility needed when assembling the steel mounting parts for the stay cable holding devices. The planning solution takes into consideration the varying dimensions and positions of the large-sized steel mounting components. Determining the climbing axes required a well thought-out planning process in order to avoid any collisions with the stay cable boxes. For this, a high degree of dimensional accuracy is required.

All ACS climbing units are provided with a trapezoidal sheet cladding. The enclosure of the lower working platforms with completely closed trapezoid sheeting provides anti-fall protection as well as additional wind and weather protection for site personnel. From the other working platforms on Level +1 and Level +2, the reinforcement in advance is installed for the entire next floor. The perforated trapezoidal metal sheeting in this area lets through light and air. Up to 42 t of reinforcement materials in total can be stored on the top three platform levels.

On the forward-inclined platform, a rotary distributor for concreting is climbed at the same time. Access to the elevator was also integrated in the self-climbing system during the planning phase. This well thought-through solution, along with the creation of 3D views for visualisation, was implemented within a short time by all site personnel in efficient teamwork operations. The experience and competent planning, as well as just-in-time deliveries of large amounts of material from Peri, have facilitated problem-free working and thus maintaining the short construction schedule. ■

Above: The two A-shaped inclined bridge pylons steadily rise up into the air with the Peri ACS climbing formwork system finally reaching a height of over 300 m.

Left: Determining the climbing axes required a well thought-out planning process in order to avoid any collisions with the stay cable boxes.

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Changing Climates, Changing Deltas

The International Association of Dredging Companies (IADC) explains how climate change influences the river deltas and what has been done to mitigate the risk.

Asia has many major, important river deltas, including the Ganges-Brahmaputra delta in India/Bangladesh, which is considered to be the largest in the world; Mekong, Vietnam; Chao Phraya, Thailand; Godavari, India; Krishna, India; Mahakam, Indonesia; and Yangtze-Kiang, China. These deltas often have large ports and harbours and thus become hubs of industry and trade. However, with land hardly above sea level or most often below it, deltas are quite vulnerable to natural disasters. Land subsidence can also be threatening.

Studies indicate that subsidence or sinking is worsened by the impacts of human activity, such as upstream sediment collection caused by reservoirs, dams, accelerated sediment compaction and control of river channels. Under these circumstances deltas are often subject to flooding and require frequent attention to their sea defences, and this is without considering the consequences of climate change.

As a result of climate change and rising sea levels, this vulnerability is already becoming more acute and causing severe impacts on the natural processes in deltas. The lives of the millions of people living there have been and will be affected dramatically. Today about 500 million people live in or near river deltas and the prognosis for the future is that people will continue to gravitate to these fertile areas.

The Mekong river delta in Vietnam.

Flood risk and erosion

According to the Intergovernmental Panel on Climate Change (IPCC), climate-related changes in the past century are continuing in the 21st century and include an acceleration in sea level rise, further rise in sea surface temperature, more extreme weather events and storm surges, altered precipitation and ocean acidification. This could lead to a 50 percent increase in delta surface areas that are vulnerable to flooding. At coastal zones and deltas these climate-related changes are already having a range of physical, economic and social impacts.

On the border between India and Bangladesh at the Sundarbans islands, which are amongst the world's largest collection of river delta islands, woven through by an elaborate network of streams and tributaries, the sea level rise has already proved devastating. Nearly 31 square miles of the Sundarbans have vanished entirely and more than 600 families have been displaced, according to local government authorities. Four million people on the Indian side alone, as well as the royal Bengal tigers that make their habitat there, are threatened by flooding related to climate change.

And in a worse-case projection, a Vietnamese government report said that more than one-third of the Mekong delta, where 17 million people live and nearly half the country's rice is grown, could be submerged if sea levels rise by three feet in the coming decades.

Rising sea levels are increasing the flood risk and erosion along the coast, but they may also impact freshwater availability. They are already resulting in an accelerated loss of coastal ecosystems like wetlands and mangroves. Climate experts emphasise the importance of adapting to these effects by developing and implementing coastal protection and adaptation strategies for each deltaic region, be it a delta where water is rising rapidly or other areas where a water shortage is resulting.

Are soft solutions a better approach?

Many solutions of the past – the hard technical defence solutions that completely block the natural processes – need to be reconsidered. What once were accepted solutions are often not sustainable anymore because of the increased dangers brought on by global warming. New approaches are therefore being sought.

In the current search for sustainability, a more flexible approach, the so-called 'building with nature' strategy, is being developed by major international dredging companies. These 'soft' or system-based measures present strategies in which the natural, dynamic forces in a delta are re-instated. Research indicates that these system-based methods may be a better way of coping with climate change. Many research organisations as well are exploring, developing and implementing new softer approaches, which create a dynamic equilibrium between land and water.

Soft solutions include employing physical measures aimed at the management of sediment and/or at the management of water; adapting human behaviour; and in some cases, taking no action at all.

Physical measures for managing sediment and water can entail full or partial recovery of a water system such as removing dikes, seawalls and dams as well as steering natural processes by creating flood areas and using sand replenishment along the coastline. Dredging is an important tool for addressing these problems.

Western Europe has a long tradition of beach nourishment, using trailing suction hopper dredgers that rainbow sand onto the shore. In recent years, given the looming crisis of global warming, dredging contractors have sought new cost-effective, environmentally sound, long-term solutions. One of these, known as the Sand Motor, uses large quantities of foreshore placement and then allows currents to gradually transport sand to shore. Other pilot projects for the restoration and/or relocation of dunes are being conducted, as well as measures for managing salt marshes, mangroves and re-creating wetlands.

Adapting human behaviour may be more difficult, but spatial planning of deltas, which includes the evacuation or even relocation of people to less risky higher elevations, can be effective in reducing the harm to life and livelihood caused by flooding. By identifying flood hazard and buffer zones, damage can be controlled. Taking no action at all is probably only feasible in less populated coastal areas where swift evacuation in times of flooding can be easily realised.

These soft system-based strategies may be less expensive than hard technical solutions and more sustainable in the long term. The key is an integrated approach, combining technical, ecological (or natural) and social measures A storm-surge barrier at the mouth of a river, which can be closed and opened so that protection is provided and natural processes remain active, is one such remedy that has been successfully used in the UK and the Netherlands.

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One of the 'soft' solutions is to employ physical measures for managing sediment and water. This can entail full or partial recovery of a water system such as removing dikes, seawalls and dams as well as steering natural processes by creating flood areas and using sand replenishment along the coastline; dredging is an important tool for addressing these problems.

Current efforts

Several systems have been and are being developed to help scientists and engineers study river deltas and devise new soft engineering solutions. The World Delta Database (WDD) website (www.geol.lsu.edu/WDD) contains data about vulnerability and physical characterisations of specific deltas. It offers a means to determine indicators of the physical vulnerability of the coastal area as well as the risks to society at those areas. The goal is to discover soft, ecosystem-oriented engineering solutions that permit adaptation or mitigation responses from these coastal communities.

In addition, EcoShape (www.ecoshape.nl), a consortium of Dutch specialists with a rich history of solving coastal infrastructural challenges in the Netherlands and abroad, is working on systems for the benefit of sustainable coastal development and protection such as land reclamation, sea and river defences, dike building, dredging to protect nature, and developing state-of-the-art models for ecodynamic design.

Deltas are diverse and complicated ecosystems and no one-size-fits-all solution is suitable. Continued research efforts are a necessity. Investments in the further study of ecological, morphological, economic and social factors must be made and cooperation amongst a variety of international and national agencies and the private sector is imperative. Finding the best solutions in terms of quality of life, safety and affordability will present government authorities with decision-making challenges.

The private sector, including engineers and dredging companies, also has a role to play in pursuing innovative, system-based delta management. ■

IN THE CURRENT SEARCH FOR SUSTAINABILITY, A MORE FLEXIBLE APPROACH, THE SO-CALLED 'BUILDING WITH NATURE' STRATEGY, IS BEING DEVELOPED BY MAJOR INTERNATIONAL DREDGING COMPANIES. THESE 'SOFT' OR SYSTEM-BASED MEASURES PRESENT STRATEGIES IN WHICH THE NATURAL, DYNAMIC FORCES IN A DELTA ARE RE-INSTATED. RESEARCH INDICATES THAT THESE SYSTEM-BASED METHODS MAY BE A BETTER WAY OF COPING WITH CLIMATE CHANGE.

Seminar on dredging and reclamation in Singapore

The international seminar on dredging and reclamation in Singapore, organised by IADC, was recently held from 27 to 31 October 2014 at the Grand Park City Hall hotel. This five-day intensive course aims to provide an understanding of dreging through lectures by experts in the field and by interactive workshops. At the end of the seminar, each participant receives a certificate of achievement in recognition of the completion of the coursework.

This year's lecturers included experts from three major dredging contractors - Frans Uelman, expert in dredging and environment, Hydronamic engineering department, Royal Boskalis Westminster NV; Philip De Nys, chief operations superintendent of dredging activities, Jan De Nul NV; and Luk Verstraelen, senior engineering manager, RMPE department, DEME NV. There were also two guest speakers from DHI Singapore and the Korea Institute of Ocean Science and Technology.

Participants came from not only Singapore, but also all over the world, including Malaysia, Brunei, Vietnam, Indonesia, the Philippines, Hong Kong, Korea, UAE, Maldives, the UK, Russia and even as far away as Nigeria and Argentina.

A highlight of the seminar was the boat trip to see some reclamation projects and dredging equipment in action around the western part of the country.

The IADC seminar is targetted at both existing and future decision makers and their advisors in governments, port and harbour authorities, offshore companies and other organisations that have to execute dredging projects. The programme is continually updated to meet the dynamism of the industry.

IADC is the global umbrella organisation for contractors in the private dredging industry. It is dedicated to not only promoting the skills, integrity and reliability of its members, but also the dredging industry in general.

Next year, the IADC seminar will take place in Jakarta, Indonesia.

Above and left: A highlight of this year's seminar was the boat trip to see some reclamation projects and dredging equipment in action around the western part of the country.

Above and left: The IADC seminar included both lecturers and workshops.

Below: A certificate of achievement was given to each student at the end of the seminar.

Dredging for the future

Speaking to Southeast Asia Construction during the seminar, Mr Uelman explained how the dredging industry will become more important in the future due to urbanisation and climate change. "By 2050, more than 65 percent of the world's population are expected to live in urban areas and many of them would reside near the coast. With such huge transition, there is a greater need to reclaim lands for these people to live on, and at the same time protect them against floods caused by the rise in sea level," he said. Other drivers of dredging include increased tourism, expanding world trade and the surge in demand for energy consumption.

Mr Uelman also said that the dredging industry has experienced dynamic changes over the past decade. "Not only does the scale of the projects get bigger, dredging techniques and surveying methods are now much more advanced, and safety at sea has improved."

However, Mr Uelman noted that safety is still considered a challenge to the industry. "Safety has to be a mindset, not a rule. Safety programmes that are enforced by regulations have been proven ineffective at a certain level,' he said. "People must be committed to embrace safety as a personal value, on their own will." ■

Website: www.iadc-dredging.com

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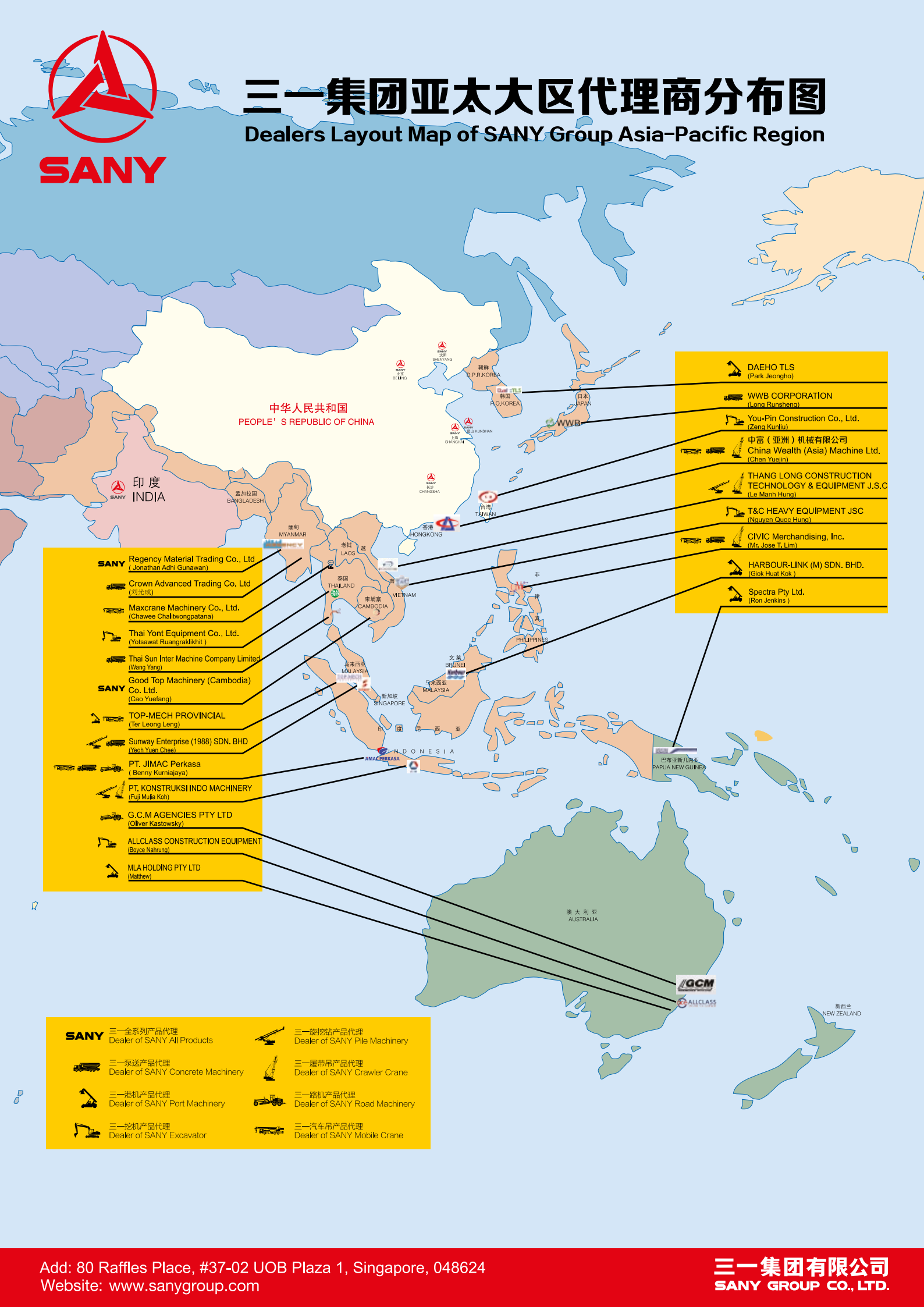

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IVANPAH SOLAR POWER FACILITY

Left and above: Three Alimak Scando 650 passenger and material hoists with dual hoist cars were used during the construction of three 140 m solar receivers/boiler towers at the Ivanpah Solar Power Facility. With a payload of 3,200 kg and a lifting height of 140 m, the hoists provided efficient vertical access for both people and materials on the site.

The Ivanpah Solar Power Facility in the Mohave Desert, USA, is believed to be the world's largest solar thermal power plant currently in operation. Located in California's Ivanpah Dry Lake on more than 1,600 ha, the station is expected to produce 390 MW of electricity for more than 140,000 customers of Pacific Gas & Electric Company and Southern California Edison by using over 173,500 software controlled heliostats (mirrors), which will track the sun in two dimensions and reflect sunlight to the three boilers that sit atop the almost 140 m tall towers. The high temperature steam will then be piped from the boilers to a turbine were electricity is generated.

Three Alimak Scando 650 passenger and material hoists with dual hoist cars were used during the construction of three 140 m solar receivers/boiler towers at the facility. With a payload of 3,200 kg and a lifting height of 140 m, the Alimak hoists provided efficient vertical access for both people and materials on the site.

Alimak Hek working with Bechtel Power & Bechtel Equipment performed an engineering evaluation and specified the Alimak Scando 650 FC 32/32 II system for this project. Travelling at 54 m/min, the hoists have a 1.5 m wide by 3.2 m long by 2.3 m high car size and a 3,200 kg capacity, which was more than sufficient to transport site workers and bulky palletised materials to working height.

Suitable for use in harsh environments, the Alimak machines were anchored to structural steel at approximately 12 m intervals and the mast was allowed to extend above the deck 12 m to allow for access when the modular components were hoisted. The strength of the Alimak mast made this possible. ■

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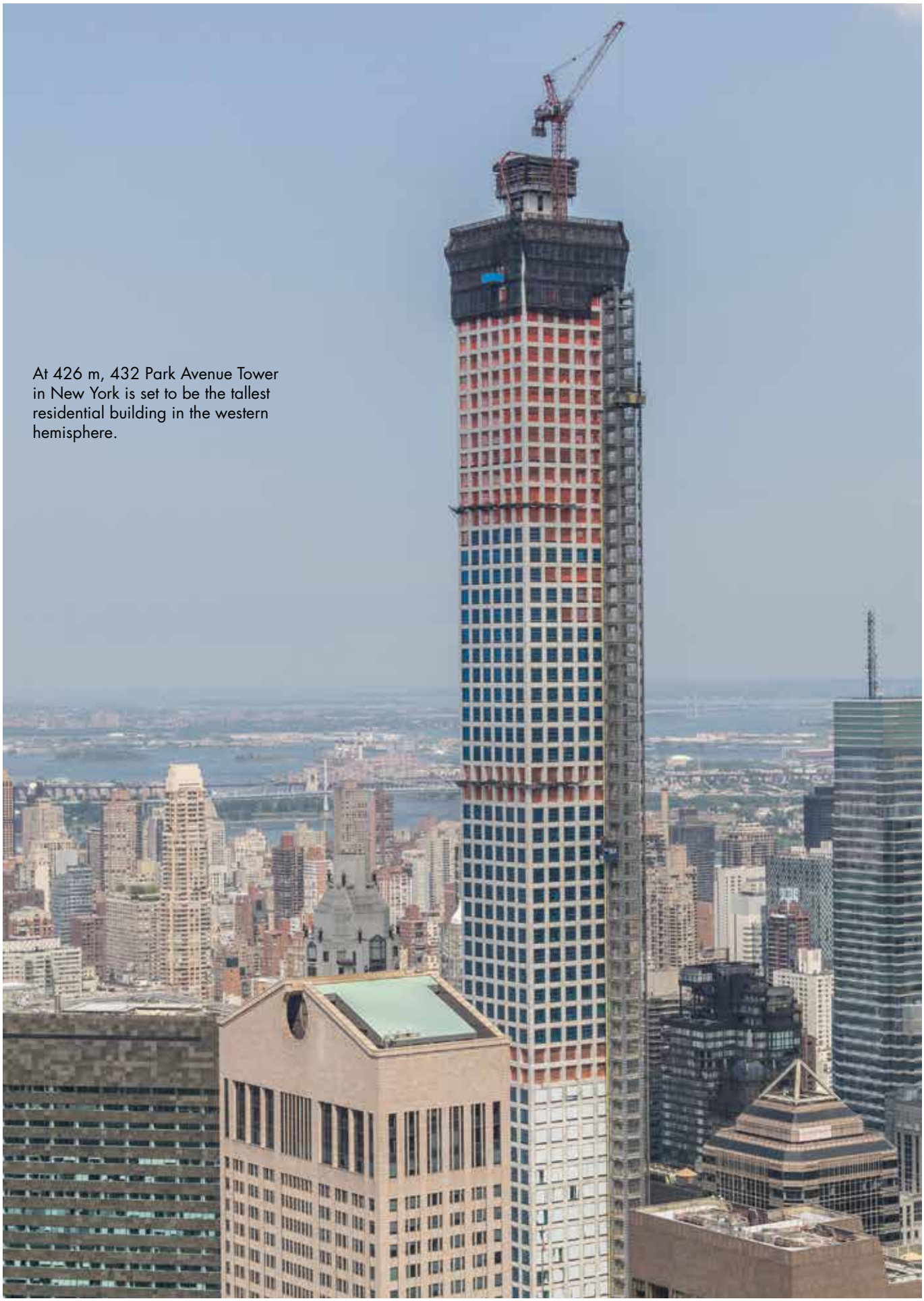

At 426 m, 432 Park Avenue Tower in New York is set to be the tallest residential building in the western hemisphere.

432 PARK AVENUE

Work on the 432 Park Avenue Tower in Manhattan, New York, USA, is currently underway. With a height of 426 m upon completion, it is believed to be the tallest residential building in the US and in the entire western hemisphere.

Nearly the entire highrise is intended for residential purposes, with 104 apartments planned on 96 floors. Among the amenities enjoyed by the owners are separate entrances, private elevators, the building's own 800 sq m restaurant, an indoor swimming pool and living space ceilings up to 3.80 m high.

The building's architecture is marked by lean proportions resulting from a square base of approximately 28 m by 28 m that remain unchanged even with increasing height. Construction began in September 2011 and is scheduled for completion in 2016. Roger & Sons Concrete Inc is the contractor on the project.

Building core

The building core is moving along rapidly thanks to Doka's SCP Super Climber, the automatic climbing formwork custom-made for the US market. Known for top quality and multiple re-use cycles, Doka's Framax Xlife framed formwork was selected for this project. It is used to pour the entire tower without the need for replacing sheets. The results are savings in time and material, and consequently lower costs.

Developed especially for shafts, Framax stripping corner I yields additional efficiencies. It enables forming and stripping by means of simply turning a practical ratchet, thereby helping to keep forming intervals short. There is no need to open the inside formwork all the way; only a few centimetres have to be separated from the concrete. Thanks to the spacious outside platforms attached to the SCP, the outside formwork can be rolled back with ease for cleaning the face sheet and incorporating the reinforcement. In order to climb the core formwork safely, two stair towers are integrated into the platform.

The concrete placing boom attached to the top pours the core, floor slabs and columns and climbs along without needing a crane as well. One climbing section measures 4.70 m. It takes just 30 minutes to raise the entire core formwork. This rapid climbing process is achieved using a long-stroke climbing cylinder. The entire system is lifted in one step. Another advantage of the Super Climber is its ability to handle heavy live loads. Three working levels move the concrete placing boom, reinforcement, crew as well as the entire infrastructure.

The Xclimb 60 automatic climbing formwork moves an individual steel formwork according to the customer.

Facade and floor

Climbing on the exterior wall also does not require a crane. The Xclimb 60 automatic climbing formwork transports the steel formwork custom-made to meet client requirements. A stainless steel Nirosta

face sheet is used to cast columns and drop beams in one common step. Since the majority of the concrete surface will remain untreated, there is the added requirement for fair-faced concrete quality. Using the steel face sheet ensures great results in this respect, said Doka. Thanks to the virtually unlimited number of re-use cycles offered by the steel formwork face sheet, the construction progress can continue without interruptions, such as for replacing individual panels. When stripping, columns and/or drop-beam formwork is simply folded back and repositioned in an automatic climbing process. This way an average cycle time of 3.5 days per level is achieved.

The automatic climbing formwork includes a total of five platform levels. Level +1 is dedicated to pouring, level 0 to rolling formwork in and out, cleaning work and placement of reinforcement. Levels -1 and -2 are needed for hydraulic lifting and/or installation and removal of climbing cones. Finally, a fifth level provides an integrated suspended platform for any rework.

The Staxo 100 load-bearing tower designed with sturdy steel frames for heavy-duty loads is used for floor heights that exceed one storey. A table lifting system (TLS) on the facade moves the floor formwork, among other things, and renders the expensive crane use obsolete here as well.

Top: The building core is moving along thanks to the SCP Super Climber, the automatic climbing formwork custom-made for the US market.

Above: The concrete placing boom climbs crane-independently and casts the core, the slabs and the columns.

"This skyscraper will become a new landmark for New York. It rises from the heart of Manhattan and is twice as tall as any building in its immediate vicinity," said Antonio Rodrigues, owner and CEO of Roger & Sons Concrete Inc. Following the One World Trade Centre at 541 m high, 432 Park Avenue is set to be the second-tallest building in New York. ■

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PAITA PORT

One of the largest construction operations ever performed at the container terminal of the Peruvian Port of Paita has been placed in the hands of the Portuguese engineering and construction group Mota-Engil. Located in the northern region of Piura, the Paita Port is believed to be the second largest port in Peru regarding container movement and the fifth one considering total cargo. Mota-Engil was awarded permission to operate and modernise the pier for 30 years. The investment cost for the modernisation will amount to approximately US$230 million.

Paita's pier has become one of the most important piers of Peru. The construction activities for the new container terminal began in 2012. State-of-the-art equipment and a modern infrastructure will help the pier develop into one of the focal points for foreign trade development in the region.

Versatile machines

To help complete the project on time, Mota-Engil has selected two Terex crawler cranes that were bought from Ferreyros. The models HC 230 and HC 275 were delivered directly to the Port of Paita by ship, and were assembled right away by Ferreyros. The cranes' short assembly time helped meeting deadlines and increasing productivity.

Apart from being fast to assemble and configure, these versatile machines can be operated offshore on a vessel – which is exactly how they were used on the Port of Paita site. Placing the fully assembled machines on board the vessel was a complex operation but Ferreyros' experienced crews mastered the challenge without any problems. Once ship borne, the cranes were used in various activities such as dredging, placing rocks and stakes (pillars supporting the pier

Above: Construction work on the container terminal of the Paita Port in Peru is in full swing.

being built). With lifting capacities of more than 200 tons, the Terex HC 230 and HC 275 crawler cranes delivered on their respective tasks swiftly and efficiently. Both machines support continuous operation without compromising safety.

"For us, efficient and reliable equipment means savings in time and money. Downtime because of broken equipment means we are

Continued overleaf…

losing capital since we have deadlines to meet," said Joshua García, assistant equipment manager with Mota-Engil. The cranes operate 24 hours a day, in two shifts (400 or 500 monthly hours). They work at 85 percent of their load chart. "This is an additional safety margin we included. We switch operators every shift but the cranes keep on working non-stop," said Luis López, Mota Engil's project manager for the Paita site.

To successfully complete such a huge project, the quality of the equipment is just one of the important aspects. It is also necessary to have efficient technical support to ensure high productivity levels at the worksite. With this in mind, Ferreyros – the exclusive Terex representative in Peru – committed itself to keeping the cranes in operation so that they can work at their maximum capacity at all times in order to meet the project's tight deadlines.

"We all know that Ferreyros is the country's largest distributor, and we are aware of their customer focus. They try to fully understand our exact needs, and provide us with advice on the selection of equipment. They always have an expert available to assist us, which is the most important for us," said Mr López.

The Terex HC 230 lattice boom crawler crane offers a maximum 230-US tons lift capacity, low operating costs and a high return on investment. At 11 ft 7 in width and 10 ft height, the base crane design transports on a standard lowboy trailer. The machine can be equipped with an up to 290 ft maximum lift crane boom.

The standard hydraulic counterweight removal system makes the Terex HC 230 crane one of the easiest transportable cranes in its class. An optional Counterweight Plus package adds 54,400 lbs additional counterweight to the machine - 32,000 lbs to the carbody and 22,400 lbs upper counterweight - to improve lifting capacities across wide working radii of the boom.

The HC 230's powerful 300-hp diesel engine powers multiple hydraulic pumps, and the hydraulic system is designed to allow the operator to perform multiple crane functions simultaneously, keeping cycling times to a minimum. Two identical independent main and auxiliary load hoisting drums provide lifting power and produce a maximum line speed of 540 ft/min and maximum single line pull of 54,060 lbs. Logical load and information flow of the interactive operator's control screen and ergonomically designed cabin equipped with a heater and an air conditioner provide operator productivity and safety. The crane can climb slopes of up to 30 degrees.

Top and above: Mota-Engil uses the Terex HC 230 and HC 275 crawler cranes to carry out various activities on the project, such as dredging, placing rocks and stakes (pillars supporting the pier being built).

The Terex HC 275 lattice boom crawler crane offers a maximum 275-ton lift capacity, low operating costs and a high return on investment. At 12 ft wide and 11.5 ft high, the base crane design transports on a standard lowboy trailer.

The HC 275's powerful 325-hp diesel engine powers multiple hydraulic pumps, and the hydraulic system is designed to allow the operator to perform multiple crane functions simultaneously without hydraulic lag, keeping cycling times to a minimum. Two identical independent main and auxiliary load hoisting drums provide lifting power and produce a maximum line speed of 540 ft/min and maximum single line pull of 54,060 lbs. Freefall is standard on the main and auxiliary drums. Each drum, including the optional third drum, has power up/down. Load hoists are further controllable in stepless mode. Logical load and information flow of the interactive operator's control screen and ergonomically designed cabin equipped with a heater and an air conditioner provide operator productivity and safety. Ample workspace in front of drums allows easy access for cable installation and maintenance. ■

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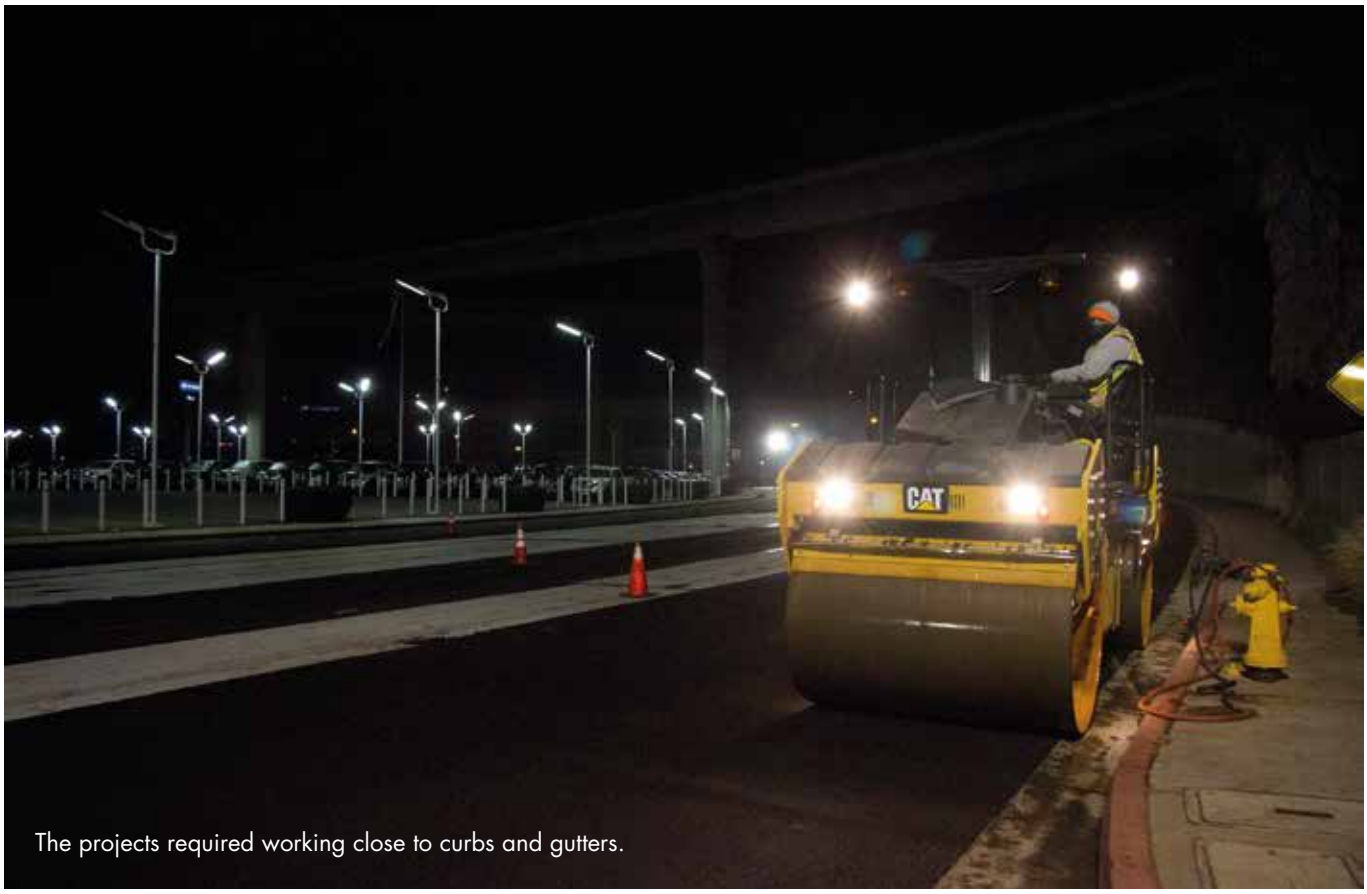

The projects required working close to curbs and gutters.

The overlay paving programme that recently took place in the city of San Diego, USA, could be divided into two separate projects - one for about 58,000 t (64,000 US t), the other about 18,140 t (20,000 US t). The individual streets were not grouped in any particular order, but instead spread out across the city. They included not only overlay, but full-width mill-and-fills, countless dig-outs and hundreds of pedestrian ramp upgrades.

After winning both bids, TC Construction Inc took efforts to combine the jobs. Art Hernandez, paving estimator at TC Construction posted a map and marked each and every overlay. He then developed a plan on how to efficiently handle each street repair.

This made sense in terms of efficient usage of the crew and equipment, but created other challenges. The more efficient the field operations became, the more details there were to track from an administrative standpoint. For example, each street and its associated mix had to be billed against a specific project.

"We came up with a coding system for the tickets," said Mr Hernandez. "It wasn't anything special, but the point is that while we were combining these projects, we also had to keep them separate, too. Sometimes it became confusing."

Milling challenges

Specifications required milling 51 mm of existing asphalt and then placing 76 mm of new material. The milling, and later asphalt, were tapered so existing curb and gutter matched.

TC partnered with a subcontractor to handle the milling. TC planned to let those crews do their work and then come back a day later and complete the overlay. The city, however, wanted the paver to work immediately behind the mill to minimise the length of the street closures. That meant adjusting the process so the paving crew worked 122-152 m behind the mill.

The change was not without its challenges. First, the subcontractor only had a single mill allocated to the job and he planned to take two passes with the one machine. With the new direction, there was not enough time for that process; there had to be two mills, as TC also had to finish the paving quickly.

Adding a second milling crew had its own drawbacks. "Having two milling crews there, along with our paving crew, made for a crowded jobsite," said Mr Hernandez. Paving so close to the mill had other repercussions. "You're adding an entirely new layer of machines and labour, all of which can impede or halt production at any time," added Mr Hernandez.

In addition, achieving a continuous pavement mat meant trucking the asphalt through the Southern California traffic. TC utilised about 15-20 trucks per day. Paving crews had to be sure they could use the mix that was in transit, even if the mill had problems. "We typically ground far enough ahead so that if there was a breakdown, we could use the asphalt that was in transit," said Mr Hernandez.

The milled surface also had to be swept before tack could be applied. "Cleanup was a big issue during the milling process," continued Mr Hernandez. "At first we utilised only one sweeper. We convinced the subcontractor to add a second."

Left: Paving widths were usually 5.5 m though the contractor sometimes utilised Cat's wing extensions to achieve a width of 6 m.

Below: Handling finish work was a CD54B.

Paving

Asphalt was delivered utilising booster trucks with strong arms, with hauling capacities of 30,000 kg. The manoeuvrability and efficiency of those trucks was a perfect match for San Diego's traffic. Paving widths were usually 5.5 m though the contractor occasionally utilised Cat's wing extensions to achieve a width of 6 m. "Sometimes the city would require a certain width because they wanted the joint line under the striping," said Mr Hernandez.

Sourced from two plants, the mix utilised 13 mm aggregate. "The fact it came from two plants was another consideration. Fortunately we rarely received mix from both plants on the same day, but we did alternate plants day-to-day. It meant adjusting to the haul lengths and the traffic flow at different times of the day. The only real difference was the impact on trucking," explained Mr Hernandez.

The mix was 160º C at the plant and about 138º C in the hopper. It was typically 132º C behind the screed. A Cat AP1055D placed the mix at a depth of 76 mm. Only one lift was required.

Handling breakdown compaction was a Cat CB54. It typically made eight passes, with each movement in forward or reverse counting as a pass. Four of the passes were vibratory.

Next a pneumatic compactor made four passes, working at a temperature of about 93º C. Handling finish work was a CD54B, with four passes at about 77º C

Plenty of other obstacles also emerged. One of them involved night paving. "It is a changed condition. Our material supplier had to open the asphalt plant at night, which costs more. We had to bring out light towers," said Mr Hernandez.

When traffic would be a significant issue, TC requested a change to a night shift. That, too, created logistical challenges. "We had to get a noise permit," said Mr Hernandez. "We had to knock on doors and ask permission. On one street there were 500 people we had to talk to."

Another challenge resulted when a governmental agency (in addition to the city of San Diego) became involved. Securing permission just to post a sign created a whole other series of permits and, frequently, delays. TC had to get an encroachment permit from Caltrans and this process took six months.

Furthermore, working around the hustle and bustle of San Diego was not an easy task. "There was a 10k race and numerous city moratoriums, such as working near the beach at certain times, or for paving downtown," said Mr Hernandez. Yet in the end, he and the crews made the jobs work no matter what challenges emerged. ■

WHISKEY JACK SUBDIVISION

Bearspaw Contracting Inc was recently commissioned to slipform the 5.5 km of curb and gutter and monolithic sidewalk with curb and gutter on the new Whiskey Jack golf course and subdivision in Sparwood, British Columbia, Canada. The company used a Gomaco three-track Commander III to perform the job.

Bearspaw put the Commander III to work in the subdivision. The curb and gutter on the project was a roll-over style with a 500 mm wide base and the curb was 235 mm tall. The monolithic sidewalk with curb and gutter featured the same style curb, with a 1.5 m wide and 127 mm thick sidewalk.

Both applications on the subdivision were pretrimmed. The learning curve with slipform paving extended to the company in charge of the grade preparation as well.

The concrete was produced by a local supplier and was a high early strength concrete with fibre mesh to accommodate the extreme weather conditions. It had a high strength of 35 MPa to counteract the climate's freeze/thaw cycle and also the large amount of road salt the municipalities use during the winter.

Production with the Commander III on the two different applications had been difficult to measure due to challenging weather conditions and a constantly interrupted supply of concrete.

The Commander III was applying a smooth finish. Finishers simply applied a broom finish and cut in the joints. Joints in the new curb and gutter were every 2.1 m and the monolithic joints were every 1.5 m.

Above and left: Bearspaw Contracting uses a Gomaco Commander III to slipform both curb and gutter and monolithic sidewalk with curb and gutter on the new Whiskey Jack subdivision in Sparwood, Canada.

Bearspaw started slipforming on the project during the second quarter of 2012, and in 2013 the company was finishing the last of it, and then would start on another 6.5 km of both applications for phase two of the development project. ■

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CAZADERO QUARRY

Northern California-based company Canyon Rock recently acquired a second quarry (Cazadero quarry), in order to provide material for rip rap, and stone, for the Sonoma–Marin Area Rail Transit project; a 70 mile long rail and bikeway that crosses the region. To operate with optimal efficiency, the company opted for a UJ440i tracked jaw crusher from Sandvik Construction. The machine was supplied by Sandvik's distributor Interval Equipment.

"The UJ440i is a step-up," said Canyon Rock's co-owner, Jonathan Trappe. "The chassis, the frame, the belt - everything is sturdier. We were looking for something that would last a lot longer than a regular contractor's primary jaw, something that would run well and last for 15-20 years." The fact that the UJ440i crusher is able to efficiently turn out two finished products from the quarried rock was the real deal clincher for Canyon Rock. "The jaw can handle major openings," added Mr Trappe. "We can open it up and make finished rip rap. Other jaw crusher manufacturers say the jaws can be opened to 200 mm, but even that is pushing it."

The UJ440i possesses a jaw size of 1,200 mm by 800mm, and has proved capable of reducing large volumes of rock at high rates of production - up to 700 t/hr. Push buttons also operate the hydraulic close side setting, which can squeeze the opening down to 100 mm from 275 mm. In addition, its conveyor belts are 1,350 mm wide and sit on hydraulic drive units that can be reversed as needed.

The UJ440i is powered by a 425 hp Volvo diesel engine that directly drives the crushing processes. The engine is able to operate without critical loss of power whilst consuming a meagre eight gallons of fuel per hour.

Practical deployment and use of the UJ440i is enhanced through the fitment of a 300 gallon fuel tank, which enables the crusher to process rock all day without interruption for fuelling. Yet should the need for interrupting the operation be required, emergency stop buttons are located at several appropriate places on the frame of the machine.

One of the features of the UJ440i that really impressed Canyon Rock was believed to be the pre-screen, which allows the company to make legitimate splits of the rock material. The separate pre-screen is located between the pan feeder and the crushing chamber, measuring a mere 1,125 mm by 2,100 mm. It is topped by the stepped grizzly section with a maximum aperture of 100 mm.

Gareth Orritt, Sandvik Construction's business line manager, explained, "The pre-screen on the UJ440i is a superb addition for eliminating the fines quickly. Because of the large screening capacity up to 150 tph, and the large screening area, it ensures that Canyon Rock put only clean rock into the jaw. This allows the screening plant further down the line to be so much more efficient in making the coarse rip rap products that Canyon Rock needs to supply their customer base."

Top and above: Canyon Rock uses a Sandvik UJ440i tracked jaw crusher to carry out work more efficiently at its second quarry.

Canyon Rock has reportedly acquired a Sandvik QE440 mobile scalping screen unit to enhance the two-product output at Cazadero. The QE440 boasts the largest total scalping area in its class, and features three broad hydraulic material conveyors with high discharge heights for major stockpiling. It is able to produce up to 900 t/hr. ■

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SHANGHAI SUCCESS

bauma China was another resounding success. Despite the downturn in the market and the severe challenges facing the industry, bauma China still attracted 191,000 visitors (2012: 180,000) from 149 countries and regions. The show once again occupied all of the exhibition space – a total of 300,000 sq m – at the Shanghai New International Expo Centre. It gathered 3,104 exhibitors from 41 countries (2012: 2,718 exhibitors from 38 countries), which is an increase of 14 percent compared to two years ago. The number of international buyers also rose by 12 percent.

"bauma China 2014 is taking place in the midst of a recession in the construction machinery market. However, judging by the exhibitors and VIP customers we met here, the trade show is very encouraging. At such times, bauma China is giving us vitality, hope and spirit," said Li Fangyu, VP Marketing China from Volvo Construction Equipment.

After China, the top 10 visitor countries and regions abroad were Russia, Korea, Japan, India, Malaysia, Thailand, Singapore, Taiwan, Hong Kong and Indonesia – in that order. "bauma China

remains a must in our event calendar, on a local level as well as on an international level, as we have customers from Southeast Asia, India, the Middle East, South America, Africa and Russia," said Ulrich Reichert, CEO of Wirtgen China.

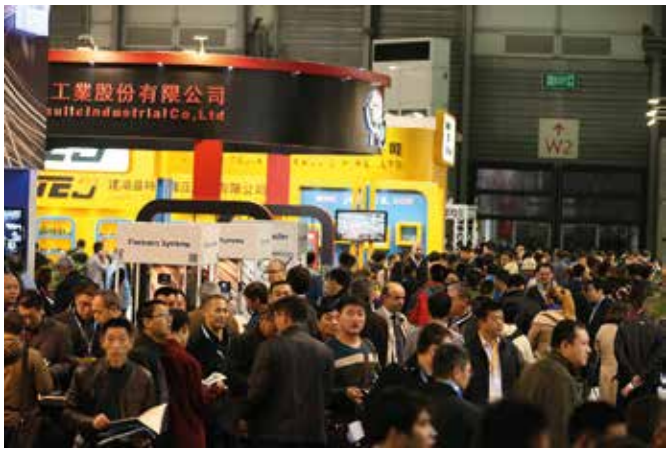
The top five exhibitor countries - besides China - were Germany, USA, Italy, Korea and Japan. The show also featured nine national pavilions, from Austria, Finland, Germany, Italy, Korea, Spain, Turkey, the UK and the US. "bauma China is the biggest and the most important construction machinery trade show in China. It attracts leading construction machinery manufacturers from all around the world. It is significant to the industry and well-known among the industry professionals," said Sun Changjun, vice president of Zoomlion.

This year, for the first time, a business matchmaking system was implemented at bauma China to facilitate contacts between exhibitors and visitors. Visitors were able to search detailed information the exhibitors had posted in the system, and thus target those exhibitors they were specifically interested in. Hundreds of advance contacts were made in this way and meetings arranged for the show, said Messe München, the show organiser.

"After 12 years of development of bauma China, this show is now not only a platform for product presentation, but also a grand industry party for communication and cooperation for further growth," said Eugen Egetenmeir, managing director of Messe München.

The next bauma China is scheduled to take place at the Shanghai New International Expo Centre from 22 to 26 November 2016. ■

Website: www.bauma-china.com



All images: Scenes from bauma China 2014.

COMANSA JIE

Comansa Jie launched its new 11CJ132-6t flat-top tower crane, the first model in the CJ1100 series. Featuring a 6 t maximum load capacity, it is the smallest model from Comansa Jie to date, with which the company expects to gain market share in countries such as China, India and the Southeast Asia region. Comansa Jie is a subsidiary of Linden Comansa in China.

The 11CJ132 can be erected with a jib length from 30 to 60 m, with configurations each 2.5 m, allowing to perfectly adapt the reach of the crane to the conditions of each jobsite. The fixed version of the 11CJ132-6t has a maximum freestanding height of 57.4 m, although it could exceed 108 m combining different types of tower sections.

This new model is the first from Comansa Jie to include the PowerLift system, developed by its parent company Linden Comansa. The PowerLift system improves the load diagram of the 11CJ132-6t up to 10 percent with reduced speeds, allowing the crane to load, for example, 1,320 kg at the jib end (60 m) instead of 1,200 kg without PowerLift. Comansa Jie expects to gradually include this system in all models. ■

Comansa Jie's new 11CJ132-6t flat-top tower crane is the first model in the CJ1100 series. Featuring a maximum load capacity of 6 t, it is the smallest model from Comansa Jie to date, with which the company expects to gain market share in countries such as China, India and the Southeast Asia region.

JLG

The JLG 1850SJ Ultra Boom is believed to be the world's largest self-propelled boom lift. Offering nearly 3 mil cu ft of reachable space, the machine delivers 19 stories of working height with a maximum capacity of 454 kg.

JLG said the boom lift can extend from ground to full height in less than five minutes, effectively reducing waiting time for the operation and thus enhancing efficiency. It is well suited to various applications including steel erection; energy-related construction such as petrochemical, power generation and wind plants; stadium, convention centre and theatre construction; and construction of apartment buildings and other multi-storey dwellings. The updated platform LCD provides a graphic display of operation information, which improves performance and operation efficiency.

The first order of 1850SJ in China has been delivered to Shanghai Horizon Equipment Co Ltd. ■

The JLG 1850SJ Ultra Boom (far right) is believed to be the world's largest self-propelled boom lift.

MANITOWOC

Manitowoc introduced two new topless tower cranes from its Potain brand. These new models are the latest innovations from the company's Zhangjiagang plant in China, which earlier this year celebrated the delivery of its 5,000th crane since production began in 2006.

The Potain MCT 205 has a 10 t maximum capacity and can lift 1.75 t at its maximum jib end of 65 m. With a focus on fast erection, the complete upperworks for the MCT 205 can be assembled in four lifts. The heaviest group of components is just 7.9 t and the full 65 m jib can be placed in a single lift. Attention has been paid to transportation too, with three jib sections able to fit inside a standard container.

The Potain MCT 85 is smaller than the MCT 205, with a 5 t maximum capacity and an ability to lift 1.1 t at its jib end of 52 m. This practical unit is easy to transport, with the entire top portion of the crane able to travel on just two trucks.

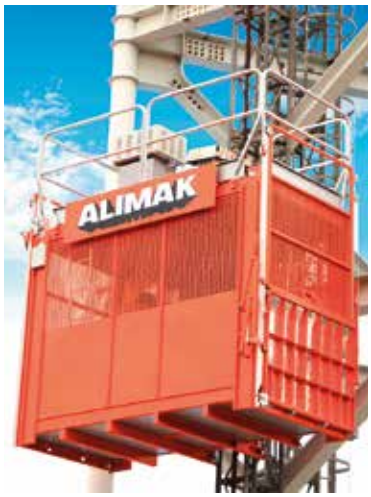
On-site assembly is also simplified thanks to the pre-assembly work done at the Zhangjiagang factory before the crane is delivered to the customer. For example, the counterjib and towerhead are fitted together as a single component and can be lifted as such. Connecting the jib, is facilitated through the use of quick and easy pin-connectors. This means the entire tower crane's upperworks is connected in just two sections.

The Potain MCT 85 features a 5 t maximum capacity and an ability to lift 1.1 t at its jib end of 52 m.

Like the MCT 205, the MCT 85 can be operated as an internal climbing crane, sitting inside the building it is constructing. Mounted on its 1.2 m mast sections, the crane offers a maximum freestanding height of 33.2 m when operating internally.

Manitowoc also showed a range of other products including a frequency-controlled LVF hoist for Potain tower cranes and the KZ100 synthetic rope, which is currently available on selected Grove mobile cranes. ■

ALIMAK HEK



The Alimak SC 45/30 hoist.

Alimak Hek's new construction hoist models include the Alimak SC 65/32 and SC 45/30. Available in single or dual car configuration, they have payloads of 2,000 kg per car, featuring car sizes of 1.5 m x 3.2 m and 1.4 m x 3 m.

Engineered in Sweden and manufactured in China, the hoists are available with either DOL (direct-on-line) or FC (frequency control) drive via a highly efficient helical gearbox system. A new design with quality, high-strength materials ensures low energy consumption, improved running efficiency and less wear for low total cost of ownership.

According to Alimak Hek, both the SC 65/32 and SC 45/30 hoists have undergone a series of rigorous safety and quality tests before being delivered to the market. Driven by a high-efficiency helical gearbox, the hoists offer increased hoistpower, smooth operation and energy efficiency, along with the safety and usability expected of an Alimak hoist.

With the new construction hoist developments, Alimak Hek aims to expand its product offerings in the BRIC markets.

Other products on display at the company's booth included the latest modular Alimak construction hoist system, Hek medium range mast climbing work platforms, light range transport platforms and a new service elevator. ■

LIUGONG

LiuGong's largest wheel loader, CLG8128H made its debut to the world. Ideal for large projects, the machine features a 4.04 m dumping height, 7 cu m rock bucket with movable blade and Dana C9672 torque converter. With a 360 kN breakout force and 12 t rated load, it only takes about 7.4 seconds to raise for full loading, which improves work efficiency.

LiuGong showcased its full line of products at bauma China, including wheel loaders, excavators, rollers, motor graders, pavers, bulldozers, cranes, skid steer loaders, backhoe loaders, track mobile crusher plants, track mobile screen plants and mining equipment. The company's new generation H series wheel loader was also launched. ■

The CLG8128H is currently LiuGong's largest wheel loader.

GENIE

The Genie SX-180 self-propelled telescopic boom lift from Terex AWP features a maximum working height of 57 m, with a 54.9 m vertical reach and 24.4 m horizontal reach, providing a working envelope ideal for extreme access jobs. It is suited for applications in commercial construction, industrial construction and maintenance, as well as in the oil and gas industry.

The Genie SX-180 boom is designed to be driven at full height. Travel speeds vary based on boom position and range from 4.02 km/hr with the boom in the stowed position, 0.65 km/hr below 38.1 m and 0.17 km/hr above 38.1 m. The 2.44 m wide by 0.91 m long platform has an unrestricted capacity of 340 kg. The 3.05 m, 135° (vertical) and 60° (horizontal) rotating jib positions workers and gear exactly where they are needed.

The new, patented XChassis system is another innovative feature of the Genie SX-180 boom. The system can extend and retract the axles to provide both stability on the job and a narrow profile for transport.

The boom is also easy to transport; it can be delivered on a low bedded trailer. The stowed dimensions are 3.05 m high and 2.5 m wide. With a stowed length of 12.98 m, the 24,948 kg machine requires no over width or over height permits allowing it to be easily transported on a truck.

The Genie SX-180 self-propelled telescopic boom lift has a maximum working height of 57 m, with a 54.9 m vertical reach and 24.4 m horizontal reach.

For simple maintenance, there is easy access to important systems and components, robust hose and harness routings and access to slew bearing bolts from topside. The rotating jib offers a robust slew bearing and worm drive arrangement. In addition, new platform controls consist of toggle switches and fully proportional jib and boom controls. The ground controls offer an updated function diagram layout and tactile membrane switches. Customers can choose from either a Deutz or Perkins engine. A fuel tank with a 189 l capacity for longer run time and a 7.5 kW generator are standard equipment. ■

MTG

Users of MTG wear parts for hot slag applications have had, until recently, access to MTG Systems KingMet range of GET. The latest innovation on the design of the pin, featuring a unique metallic retainer now allows users to access all the hammerless MTG Systems StarMet range of benefits. The main advantage of the StarMet hot slag solution, when compared to KingMet, is that with StarMet users will only need to change the pin and the retainer due to the wear, while with KingMet users would also have had to change the adapter.

Specifically designed to perform in hot slag applications, the pins and retainers are available in up to eight different sizes (30 to 240) to suit a wide range of machines, and are fully compatible with current MTG Systems StarMet teeth and adapters. ■

This convenient pin and retainer conversion system eliminates the need to change adapters.

SHANBAO

Shanbao launched a new range of mobile equipment. This new product line meets the current market demand for more versatile application. It comprises a full range of mobile machinery that is set on both wheel and modular unit, including Shanbao's first tracked based crushing plant.

The core technology of this tracked mobile unit is in the PV jaw crusher. The V-design has an excellent crushing working range. Its lightweight design also improves mobile performance. This is a proven design used on the static crusher station, according to Shanbao. Since 2011, it has been used in a wide range of applications including metal mining, aggregate and limestone crushing.

Shanbao adopts an environmental approach to the design concept by introducing a fully electric driven crusher, feeder and conveyor system on the mobile range. The power inlets are easily connected from existing electric power grids. In remote green field locations, these units have the flexibility to run a dual system to operate on diesel or electric drive. Flexibility on the design has enabled the machine to be powered by any stand-by electric generator set and therefore creating an environment-friendly mobile crushing and screening range. Running the mobile crusher on this low emission method generates a minimum carbon footprint. It is also cost effective compared to other fully diesel driven mobile crusher units, said Shanbao.

Furthermore, Shanbao has designed a full range of tracked, wheeled and modular units to include primary, secondary and tertiary crushing and screening equipment. Each of the units is designed with operator safety in mind. There are clear warning marks on the safety points to alert users of potential hazards.

A new Shanbao mobile crusher being launched at bauma China.

Each of the units is also equipped with an all-weather lamp to allow continuous low light and night-time operation. In addition, daily service points are located on the machines with ground level access. For area on the elevated height, each mobile unit has incorporated a maintenance platform. A safe maintenance area on the machine is incorporated using a Remote Control System (RCS) for operation on all equipment.

Shanbao wheeled units are designed for all on-road transport conditions. They are easy to set up, with trailer and container concepts using a standard prime mover. In the transport mode, each unit complies with the transport requirement for height and width restrictions. Transport to operation can be achieved within two hours, allowing quick deployment time. One of the highlights is the ability to remove the trailer wheel set from the frame. This new wheel set design can be used on other wheeled mobile units. ■

MANITOU

The Manitou MT-X 1740 SLT telehandler is versatile and can be used with a wide range of attachments. It is suitable for any construction site and also for rental activity. With excellent lifting performance, the machine can reach the roof of a three-storey building and easily load different types of materials up to 4 t.

Manitou has also improved the performance of its rotative telehandler range with the launch of the MRT-X 3255. Excellent for rough terrain conditions, this '3-in-1 equipment' not only combines the benefit of a telescopic machine but also can replace a mobile crane or an access platform.

Other machines on display included the MRT1840 Easy and MT-X732 telehandlers; Mustang 3300V and 2600R skid steer loaders; Gehl V400 skid loader; and 100VJR, 170AETJ and 200ATJ aerial work platforms. ■

The Mustang 3300V was one of the products on display at Manitou's stand.

SANME

Sanme's SMS series hydraulic cone crusher is designed for hard and medium hard rocks and ores. The company said the crusher has been improved in many aspects to increase the production and maintain the quality, including the insurance cylinder, accumulator, clear cavity and integration base.

The design of the optimised crushing cavity improves the crushing capacity. The insurance cylinder can protect the crusher's spare parts and reduce the impact load on the machine damage by flowing back the hydraulic oil to the accumulator instantaneously and uplifting piston rod rapidly when crusher in iron or other load suddenly increases. The design of the clear cavity oil cylinder helps to improve the reliability of the hydraulic system. The new integrated base simplifies the installation steps.

The JC series jaw crusher features the symmetrical V cavity structure, which leads to toggle of large obliquity, long stroke and reasonable rotor speed. It has a large material block in feeding, high productivity and homogeneous output granule.

The SMS hydraulic cone crusher (above) and SMG cone crusher.

The SMG series cone crusher offers low operating cost with excellent shape of end products. It has been widely used in the mining and aggregate processing industries and is suitable for crushing hard and mid-hard ores and rocks. It can also be used for secondary and tertiary crushing, and sand making. ■

BAUER

Bauer highlighted its ValueLine BG 26 and BG 38 drilling rigs, as well as its GB 46 and GB 60 grab carriers.

The BG 38 is designed as a modular machine with several expansion stages. At bauma China, it was shown in the maximum expansion stage; in this configuration, it is possible to produce bored piles with a diameter of 2.5 m and drilling depth of 91 m.

In the area of grab technology for diaphragm walls, a newly designed grab concept was presented in the form of the DHG V hydraulic grab on the GB 46. Notable features of the grab include not only a new TD4 turning device but also an open design of the basic body to reduce turbulence when moving the grab in the support suspension. In addition, pick teeth are used for breaking open hard ground and there is a modular expansion capability for trench lengths from 2.4 to 4.2 m and trench thicknesses from 600 to 1,500 mm.

Bauer's drilling rigs on display at bauma China.

Bauer also displayed a Klemm drilling rig produced in Shanghai and a Prakla well drilling rig. The company said it had numerous visitors from Russia, Malaysia, Singapore, the Middle East, Australia, Sri Lanka, Pakistan and South America. ■

SUMITOMO

Sumitomo's new HA90C-2 asphalt paver is fitted with the new J-Paver2875 screed. The design of this machine is based on the company's HA90C model with the J-Paver3075 screed.

The HA90C-2's transportation width has been improved to 2.8 m at its minimum, meeting the target of less than 3 mm transportation width. The J-Paver2875 screed has an infinitely variable extension system from 2.8 to 7.5 m and can be further extended up to 9 m by adding two sets of 0.75 m extension screed on both ends.

The mould board operation is now hydraulic-driven, resulting in easier operation and further improvement of pavement precision. There is also an electric heating system, apart from the LPG heating system.

The hopper length has been extended by 200 mm. The height of the hopper front is lowered to 550 mm and the dial-style steering system is also available. Combined with lever operation, it enables fine-tuning in the pavement of curved road or narrow road.

The operating compartment and both sides of screed have colour monitors to display more information including machine status and maintenance intervals. For quick and simple preparation and clean up, the screw has been changed to quick-release type that covers up to 7.5 m pavement and the retaining plate has also been optimised for this new screw. ■

Sumitomo's new HA90C-2 asphalt paver is fitted with the new J-Paver2875 screed.

LONKING

Lonking unveiled its Tier 4f 36 t crawler excavator. The company said the machine received an order from European customers during bauma China.

Lonking also showcased its four wheel loaders, which feature environment-friendly material and an energy-saving engine, resulting in low noise and vibration.

In addition, Lonking exhibited its 12 t single drum roller with double frequency and amplitude hydraulic vibration, and new 3 t tandem compactor.

Lonking's other products that were on exhibit included forklifts, backhoe loaders, bulldozers, motor graders and skid steer loaders. ■

Lonking introduced a variety of new products at bauma China.

HAULOTTE

The HA16 RTJ articulated boom from Haulotte is designed for easy maintenance and a high level of safety. It has a working height of 16 m and can be used in many applications such as building works, finishing works, maintenance works, demolition works, etc. It features a lifting speed of 40 seconds, reduces fuel consumption by 15 percent and is equipped with a modular basket that can be changed within an hour.

The HT23 RTJ telescopic boom has a 22.5 m working height, lifting speed of 56 seconds and horizontal outreach of 18.3 m. It is ideal for a wide range of industries including construction, shipbuilding, chemical and petrochemical, and aviation.

The Compact 14 electric scissor lift is suitable for building maintenance works, logistic operations and many other applications. With a 1.20 m width, 2.50 m height in the stowed position and pulldown guardrails, the Compact 14 is very mobile.

The STAR 10 electric vertical mast has a stowed height of only 1.99 m and can pass through standard doors. Featuring a width of 0.99 m and 360° rotation with zero tail swing, the machine is well suited to working in congested areas.

The Quick up 14 is for indoor use and easily transportable. It ranges from 7 to 14 m, which is convenient for use in places like theatre, stadium, etc.

In addition, the HA15IP electric articulating boom is intended for both indoor and outdoor applications. ■

The Haulotte HA16 RTJ articulated boom has been designed for easy maintenance and a high level of safety. It is suitable for a wide range of applications.

SANDVIK

The new Tiger series drilling rig from Sandvik Construction is a hydraulic, self-propelled, self-contained, crawler based surface drilling rig designed for applications such as road cutting, pipeline drilling and foundation drilling, as well as production drilling in medium-sized quarries.

Featuring a robust structure, a low centre of gravity and heavy-duty tracks with an efficient guide system, the Tiger rig offers great stability and top-class balance even in uneven terrain. It is equipped with a fixed boom, an efficient rod handling system and high performing Sandvik rock drills that provide continuous excellent rates of penetration. Moreover, the advanced rock drilling control system guarantees smooth collaring thereby improving the rock tools' service life, delivering better hole quality and thus improved blasting results.

With its tailor-made user interface, the Sandvik Tiger allows all drilling functions to be handled with a single joystick control, with all drilling parameters being easily adjusted from the cabin. The cab is ROPS and FOPS certified, and also soundproof keeping the noise level well under the limit of 85 dBA. Large windows offer an unobstructed view to the drilling spot, and the safety grid on the windshield protects operators from falling objects.

The Tiger series is powered by a 179 kW Tier 2 engine with a large fuel tank of 425 l maximising drilling time. Six working lights are situated at the front of the machine, with two at the rear, thus ensuring efficient operation even during limited light. As with all Sandvik drill rigs, the new Tiger series is also designed with ease of maintenance in mind. All daily maintenance points are on the ground-level, and components are placed within easy reach.

The Tiger series has two models, including the Tiger DG700 for hole sizes of 64 – 115 mm and Tiger DG800 for hole sizes of 64 –127 mm.

In addition, the new Rammer 4099 PRO hammer is suitable for carriers in the 34 to 55 t operating weight range. The 3,750 kg hammer is based on the Rammer 4099 and shares with it many key features that have established that unit as one of the most popular large hammers in the world, such as an Idle Blow Protector that works regardless of working mode to provide greater levels of protection; and long-life, high-tension VIDAT tie rods for improved reliability, extended service periods and lower operating costs.

These standard Rammer 4099 features are backed by a range of enhancements that help the 4099 PRO withstand extreme working conditions. The unit benefits from a sealed housing structure that prevents the ingress of dust and dirt, thereby extending the working life of both the hammer and the tool. A top cover plate has sealed through apertures for stump hydraulic hoses and features sealed hose connections for grease, air and water. The hammer has a sturdy housing design and wear resistant wear plates that make it perfect for horizontal working duties in applications such as tunnelling.

To match the demands of the extreme applications in which it will work, the Rammer 4099 PRO is also offered with special tools for horizontal primary breaking and is designed to work with a broad range of auxiliary systems such as automatic greasing, air flow for excessively dusty applications and Rammer's Water Jet system for dust suppression.

For customers working in tunnelling applications, Rammer has pulled together a full package of auxiliary systems and solutions designed to protect the hammer from the demands of this extreme application, lower owning and operating costs, and to make the Rammer 4099 PRO a very tough breaker. The unique AGW Unit comprises the Ramair air flush system that prevents potentially harmful dust ingress; the Ramlube I automatic lubrication system to ensure consistent and thorough greasing; and the Water Jet dust suppression package to minimise the creation of dust during breaking. Hydraulically-actuated and requiring no additional power supply, the AGW Unit is easy and safe to install and maintain, and ensures that the Rammer 4099 PRO hammer is protected and productive throughout its working life. ■

Above: Sandvik's new Tiger series rig is designed for applications such as road cutting, pipeline drilling and foundation drilling, as well as production drilling in medium-sized quarries.

Below: The new Rammer 4099 PRO hammer is suitable for carriers in the 34 to 55 t operating weight range.

SKYJACK

Skyjack's SJ III 3219 and SJ III 4632 DC electric scissor lifts are designed for use on level floors in industrial or commercial locations, and offer zero-emissions and silent operation.

The SJ III 3219 features a 5.79 m raised platform height, which equates to a working height of 7.79 m. The 227 kg platform capacity allows for a wide variety of installation and maintenance tasks. Platform length, as measured from the inside, is 1.63 m and this can be extended by a further 0.91 m with the roll-out extension deck, for a greater working area. According to Skyjack, the SJ III 3219 is the world's best-selling scissor lift.

The SJ III 4632 is the big brother of the 3219, and also the largest in the DC electric scissor line from Skyjack. It features a platform height of 9.75 m, which equates to a working height of 11.75 m. The two-man platform has a huge capacity of 318 kg, and the inside platform length of 2.13 m can be further extended by 1.22 m once the extension deck is rolled out.

Top: The SJ III 4632 is the largest model in Skyjack's DC electric scissor line. It has a platform height of 9.75 m, which equates to a working height of 11.75 m.

Right: The compact SJ 16 vertical mast lift is highly manoeuvrable, ideal for a variety of industrial and commercial maintenance and service tasks.

Skyjack's largest articulating boom, SJ 63AJ, has a working height of 21.38 m, horizontal reach of 12.19 m and up-and-over clearance of 8.38 m. The company said the SJ 63AJ is the only articulating platform in this class with an open centre knuckle riser, which gives the operator better visibility from the platform; allows for below-grade reach and also means that when folded for transport, the unit sits in a more compact package.

Advanced boom geometry allows the unit to move from ground level to full height using only the single main boom control. As with other Skyjack models, the SJ 63AJ features the True Vertical Rise feature, which ensures the boom arm does not drift when rising. The model on show at bauma China had a 48 kW Deutz diesel engine, and foam-filled tyres for better off-road durability.

The Skyjack SJ 16 vertical mast lift is very compact and highly manoeuvrable, hugely popular for a variety of industrial and commercial maintenance and service tasks. The zero-degree inside turning radius, allows the platform to manoeuvre in extremely small spaces – a very handy feature in busy or crowded work spaces.

Raised platform height on the SJ 16 is 4.75 m, which corresponds to a maximum working height of 6.75 m. Platform capacity is 227 kg, while stowed height and width are 1.79 m x 0.69 m, allowing the unit to fit through standard door openings. Power for the unit comes from a 24 V DC battery unit.

All Skyjack machines are created around the company's 'Simply Reliable' design philosophy, so maintenance is made easy through the use of the company's colour-coded wiring system, while only well-proven and easy-to-maintain componentry is used in the manufacture of the platforms. ■

XCMG

Among XCMG cranes on show at bauma China was the SQS500 telescoping boom truck-mounted crane, which has a maximum lifting capacity of 20 t. It is said to be the largest telescoping boom truck-mounted crane in China so far.

XCMG also displayed its SQZ700A and MQH37A cranes. The SQZ700A knuckle boom truck-mounted crane has a maximum amplitude of 20.7 m and leg span of 8.4 m. The MQH37A side lifter crane is known for its speed, efficiency and ease of use.

From the earthmoving machinery range, XCMG unveiled its LW900K-LNG liquefied natural gas wheel loader, which is designed to help reduce fuel costs by 30 percent and improve power efficiency by 15 percent. The top and bottom of the front and rear frames are connected with double-row tapered roller bearings, thus increasing the breakout force to over 260 kN.

There were also the LW1200KN wheel loader with a 7.5 cu m bucket capacity, maximum breakout force of 394 kN and lifting capacity of over 12 t, and is powered by a Cummins electronic-controlled engine; XT870 backhoe loader featuring a breakout force of 66 kN, excavating force of 51 kN and maximum travel speed of 40 km/hr, with the ability to perform in extreme hot and cold weather conditions (the temperature can go as low as -40°); and XT760 skid steer loader, which boasts a wide variety of extra tools including a snow plow, planer, trencher, sweeper, breaking hammer, compactor, excavating arm and snow blower, to name a few.

Some of the road equipment included the XS83 vibratory roller, which meets the North America and CE certification requirements; 39 t XS395 single drum vibratory roller with a compaction depth of over 1 m; XM1003S road surface milling machine featuring a milling width of 1,000 mm, flexible travel steering system and front axle steering angle of up to 70°; and GR215K grader, which is powered by a Cummins 164 kW turbo engine, meeting the Euro III emission standard.

The XSZ2000 hydraulic drilling rig features XCMG's proprietary technologies such as oil and gas suspension, independent axle lifting and intelligent multi-axle turning control. With a small turning diameter less than 23 m, the machine is highly flexible. It is suitable for use in harsh environments such as mud, sand, snow, etc. The machine also features the hydro-pneumatic suspension technology for excellent riding performance.

The SQS500 telescoping boom truck-mounted crane has a maximum lifting capacity of 20 t.

The XTR-series tunnel boring machine can be used for tunnelling of semi circle, oval, rectangle and U-shaped sections.

In addition, XCMG's new XTR-series tunnel boring machine can be used for semi circle, oval, rectangle and U-shaped sections. It is equipped with a spraying system and draught fan for dust cleaning to provide a better working environment. ■

VOLVO

The new mid-sized Volvo P6820C tracked paver is ideal for medium sized jobs, with some flexibility for larger scale projects. It is powered by a Volvo D6E COM IIIA/EPA Tier 3 142 kW engine. The emission-compliant engine is considerably more powerful than the model it replaces, while providing lower fuel consumption and less noise.

Fuel consumption is further reduced when the operator uses smart power mode, which lowers engine RPM to match power and demand - resulting in fuel savings of up to 30 percent, said Volvo. Reduced noise levels can also be attributed to sound lowering components and a robust frame. These features combined with smart power can dramatically decrease noise levels, compared with the competition.

The P6820C with a Volvo Variomatic screed offers a high degree of flexibility when frequently changing paving widths, up to twice the basic screed width - from 2.5 to 5 m. By adding extensions, it can pave up to 9 m widths. With a Volvo fixed screed, the P6820C is proven to be effective when paving up to 700 t per hour at 10 m wide. The level of throughput makes the paver versatile enough for a range of applications, including municipal and main roads and highways. It can also handle a range of materials, from wearing course and binder course to base course and frost protection layers.

Independent, reversible hydrostatic drives, for both bar conveyors and augers, ensure the paving material is delivered evenly to both sides of the screed. The optimum head of material is maintained in the auger channel by adjusting the height, the speed and the direction of the augers. This larger volume of material and high throughput provide optimum mat quality regardless of width, thickness or paving speed.

The large hopper capacity promotes uninterrupted material flow for greater paving efficiency and quality, and supports continuous paving, such as under bridges. The Volvo Variomatic screed, with its fast and efficient three-zone heating system also improves efficiency and mat quality. Volvo fixed and variable extending screeds produce high compaction levels, reducing time for subsequent roller compaction and resulting in a smooth high-quality mat. Volvo screeds can be used on bituminous and concrete material. Screed extensions can be added in minutes, without special tools, using Volvo's quick coupling system.

The new Volvo P6820C tracked paver is ideal for medium sized jobs, with some flexibility for larger scale projects. According to the company, fuel consumption is further reduced when the operator uses smart power mode, which lowers engine RPM to match power and demand - resulting in fuel savings of up to 30 percent.

The operator environment is ergonomically designed with an adjustable seat that affords the operator an all-around view, aiding increased productivity. From the operator's platform, a direct view into the hopper, the auger channel and the work area provides the conditions for achieving high-quality paving. The swivelling, tilting, extendable control panel features the newest Electronic Paver Management II system (EPM II), which controls all functions and guides the operator, step-by-step, through working functions.

Operators can select engine data menus in multiple languages via a large colour screen. The EPM II also monitors fuel consumption and manages service intervals to alert the operator when routine maintenance is due. A settings manager reduces set-up times by allowing operators to save settings in the system for use when the machine operates in similar conditions in the future. For security, all electronic control panels, including the EPM II, can be removed and stored in a lockable compartment.

Wide contact area crawler tracks combined with good weight distribution allow effective transfer of engine power to the ground. The rubber pad-clad crawler units are maintenance free and feature individual electronically controlled drives for each track. A system monitors track movement and controls motor response-ensuring both straight line and fixed radius work are accurate. These, combined with good weight distribution, ensure an efficient paving process. Smooth and precise control of the electro-hydraulic steering is gained via an easy-to-use dial on the control panel.

Maintenance of the P6820C track paver has been simplified, with improved service access from the operator's platform to service points, via large opening compartments. An optional central lubrication system automates lube maintenance. A canopy that is quick and easy to fold down allows easy transport, too.

Volvo pavers are available with Care Kits, to guarantee longer life and better performance of wear parts, and customer service agreements (CSAs), which bundle service and maintenance offerings into comprehensive packages that cater to a variety of customer needs. And as with all Volvo products, the P6820C tracked paver is backed by an extensive service network that provides the peace of mind that comes with an extensive worldwide infrastructure of technicians, workshops and dealers. ■

LIEBHERR

Liebherr's 300 t LTM 1300-6.2 mobile crane on a six-axle chassis made its first appearance in Asia. It was unveiled at the bauma 2013 and replaces the 250 t LTM 1250-6.1.

The LTM 1300-6.2 has a 78 m telescopic boom, offering an additional 6 m in length over its predecessor. In addition, a whole range of lattice jib systems is available, which can equip the crane for a wide range of applications.

The 12.5 – 21 m double folding jib can be extended by two additional 7 m sections to a total of 35 m. The folding jib can be erected at an angle of 0°, 20° or 40°, or as an option can be adjusted hydraulically between 0° and 40° whilst fully loaded. The 5.5 m foot section of the folding jib can be used as a heavyweight erection jib and provides a considerable load capacity of 58 t.

Liebherr has designed the new six-axle mobile crane as a classic folding jib crane, so that it can be used with the same speed and flexibility as a five-axle model by crane operators. And thanks to its high load capacity with its telescopic boom extended, the LTM 1300-6.2 is ideal for erecting tower cranes.

The LTM 1300-6.2 is the only 300 t mobile crane on the market and is therefore the smallest crane on the market with a luffing lattice jib, said Liebherr. For crane companies that want to extend their range of offerings with a luffing jib crane, this new six-axle model from Liebherr is ideal for taking a first step into the luffing jib class. The luffing lattice jib can be erected in steps of 3.5 m up to a height of 70 m. The 14 – 42 m fixed jib also has modules of 3.5 m, which helps to improve its load capacity.

All setup functions, such as ballasting and lattice jib erection, are designed to be user-friendly. The fixed jib can also be erected on its own, in other words without an auxiliary crane.

A completely new concept for the superstructure drive unit has been used on the LTM 1300-6.2. Instead of the twin-engine concept normally used on cranes in this class, the LTM 1300-6.2 is powered by a single engine with a mechanical shaft. Gear shafts are routed from the distributor gear in the crane chassis via two mitre gears through the centre of the slewing ring to the pump distributor gear in the superstructure.

A mechanical shaft ensures a particularly high efficiency level and low engine speeds in the chassis engine provide sufficient power for crane work. This ensures the economy of the new concept in terms of fuel consumption. The simplified engine concept puts Liebherr in an ideal position for modifying its diesel engines to meet the statutory emissions regulations. Other benefits over the use of a separate superstructure engine include a reduction in the amount of maintenance work and a reduction in weight. The omitted weight can be used for load-bearing components, thus increasing the crane's load capacity.

Liebherr's 300 t LTM 1300-6.2 mobile crane on a six-axle chassis made its Asia debut at bauma China.

An eight-cylinder Liebherr diesel engine that develops 450 kW at 1,900 rpm and torque of 2,856 Nm at 1,500 rpm provides the LTM 1300-6.2 with all the power it needs. The power is transferred to the crane axles via the 12-speed ZF-TC-Tronic gearbox. A torque converter has been installed for starting and accurate manoeuvring. The intarder, a zero wear hydrodynamic brake integrated in the gearbox acts as a retarder.

Furthermore, a Telma eddy current brake is available as an option. Like almost all LTM mobile crane models, the LTM 1300-6.2 is fitted with pneumatic disc brakes. According to Liebherr, compared to drum brakes, not only do disc brakes provide better braking performance but are also more economical since the brake pads can be replaced more quickly and easily and they also offer a longer service life.

The four rear axles on the six-axle chassis of the new LTM 1300-6.2 have active electro-hydraulic steering depending on the vehicle speed. This increases the manoeuvrability of the vehicle and drastically reduces tyre wear. At crab steering speed all six axles are steered, which means that there is no need to raise any axles. Five steering programmes can be selected conveniently at the touch of a button.

The LTM 1300-6.2 features the Liebherr LICCON2 crane controller, which has now become established in a number of Liebherr mobile cranes. An add-on programme has been developed for the new crane drive concept with just one engine and a mechanical shaft to allow the machine to be run with low fuel consumption. This enables the complete pump drive to be disconnected automatically when the engine is idling and then reconnected by the intelligent controller in a matter of seconds when it is required.

A mobile, multifunctional control and display unit, the BTT Bluetooth Terminal is provided for setup functions. Using this the crane can be jacked easily and safely. The crane driver also has the option of attaching and removing the hook block on the crane bumper with visual contact by controlling the hoist winch and the luffing cylinder of the telescopic boom remotely via the Bluetooth connection. The BTT is also used for other setup functions such as ballast assembly and for mounting the folding jib and the second hoist winch on the new LTM 1300-6.2. ■

HAMM

The latest Hamm HD CompactLine oscillatory rollers include HD 10 VO (2.6 t), HD 12 VO (2.8 t), HD 13 VO (4.0 t) and HD 14 VO (4.4 t). All of them are equipped with one oscillatory and one vibratory drum.

The advantage of the oscillation technology is that it attains a rapid increase in compaction as the oscillation drum directs tangential thrusting forces into the material to be compacted while remaining constantly in contact with the ground, explained Hamm. The combination of continuously acting static load and changing dynamic shear forces in the material results in a faster, better and more gentle compaction. Moreover, the amplitude and in turn the compaction power adapts automatically to the stiffness present. This effect is achieved without electronics, but through intelligent application of the laws of physics, said Hamm.

The HD CompactLine oscillatory rollers are suitable for use in urban areas. This is because oscillation drums can compact dynamically even on narrow construction sites, and according to Hamm such compaction technology does not disturb buildings or pipework below the road surface through vibration.

Oscillation also optimises compaction at joints to existing road surfaces, because it does not damage the cold asphalt. As such, the compaction on small job sites can be very effective.

During the compaction of thin layers on tack coat or spray seal, the high compaction speed makes a noticeable improvement. A further plus point in favour of oscillatory rollers is that they also work very efficiently on cooled asphalt, claimed Hamm.

Last but not least, oscillatory compaction optimises many landscaping applications. Water-bound path surfaces or asphalt cycle paths can be compacted more efficiently using the HD CompactLine rollers.

Another new model in Hamm's CompactLine is the HD 10C VT, the smallest combi roller with a working width of 1.06 m and operating weight of 1.5 t. It comes with permanent all-wheel drive as standard. This distinguishes it from all other compact rollers in this size and gives it outstanding gradeability in all situations.

In addition, Hamm has incorporated an extremely bright drum lighting into the entire CompactLine range. The environment-friendly LED lighting brings good illumination to the working area. This is an important quality and safety feature, as the compact rollers frequently work in poorly illuminated areas.

The latest Hamm HD CompactLine oscillatory rollers include HD 10 VO, HD 12 VO, HD 13 VO and HD 14 VO.

The Hamm HD 10C VT combi roller is an ideal solution for compacting water-bound path surfaces.

Another new option for all CompactLine models is the spring loaded hinged scraper. It keeps the drums clean while compacting and can be hinged out of the way by means of a foot pedal for replacement or cleaning. ■

SDLG

Among SDLG's wheel loaders on show was the LG938L, a 3 t capacity machine that is currently one of the most popular in the international marketplace. With its higher end design specifications, the LG938L is ideal for construction, mining and aggregates applications.

The LG938L's ZF transmission offers four forward and three reverse gears, while the load-sensing hydraulics give the machine a smooth feel, making operations easier for the driver. The LG938L can be equipped with up to a 2.5 cu m bucket and maximum breakout force is 96 kN. The machine has customers worldwide, including in North America, Latin America and Asia Pacific.

Another popular wheel loader pulling in the crowds at bauma China was the LG959F, notable as the first SDLG model to be sold in North America. The LG959F made industry history when it was delivered to Double K Excavating in Canada, after the company purchased the machine just weeks after SDLG launched it into the North American market in July 2013. The LG959F has a 5 t capacity rating and maximum breakout force of 152 kN. It can be fitted with up to a 3.1 cu m bucket.

Also of interest to many international visitors was the SDLG LG6300E excavator, which has a 30 t rating and powerful digging force, making it suitable for a range of heavy duty applications. The machine can accommodate up to a 1.9 cu m bucket and combines that with a maximum excavation force of 193.5 kN for excellent job site productivity. In 2013, the LG6300E was launched into Africa and two of the first units were delivered to Morocco for work on a high-speed rail link. SDLG builds excavators at its manufacturing headquarters in Linyi, China, as well as at its manufacturing facility in Pederneiras, Brazil.

SDLG also displayed its two concept machines, the L9120F wheel loader and LG6460E excavator. These two prototype SDLG machines are known for their breakthroughs in both the size and the technology. They were developed with input from the company's R&D facility in Linyi and its shared technology centre in Jinan.

The L9120F wheel loader is a 6 cu m machine with an operating weight of 36 t. It features a high-torque engine designed to Stage III standards with lower CO_2 emissions, a hydro-shift transmission, 260 kN of breakout force and a new ergonomically designed cab.

The 3 t capacity LG938L wheel loader is one of SDLG's most popular machines in the international marketplace. With its higher end design specifications, this machine is ideal for construction, mining and aggregates applications.

The G9190 motor grader was recently launched into the Indonesian market. Featuring an operating weight of 15.8 t and powered by a 148 kW Deutz engine, the machine can deliver traction force of up to 82 kN.

The LG6460E, meanwhile, has an operating weight of 44.5 t and like the L9120F has a new high-torque engine designed to Stage III standards. With a wider chassis offering stronger stability and an impressive 2.1 cu m bucket capacity, the new excavator will be suitable for a range of applications, particularly heavy duty work in mining and quarrying sites. The dual pump hydraulic system from Kawasaki offers better work efficiency and also saves energy.

Furthermore, there were several machines from the company's range of road building equipment, including the G9190 motor grader, which was recently launched into the Indonesian market. Featuring an operating weight of 15.8 t and powered by a 148 kW Deutz engine, the G9190 can deliver traction force of up to 82 kN. In addition, SDLG showcased several pieces of compaction equipment from its road building range.

The SDLG B877 backhoe loader was exhibited as well. This machine was introduced to several markets in 2014, including Africa and the Middle East. The 8.4 t-rated machine has a host of features that come as standard, such as a multi-purpose front bucket, 70 kW engine and air conditioning. ■

20 Years of Journey...

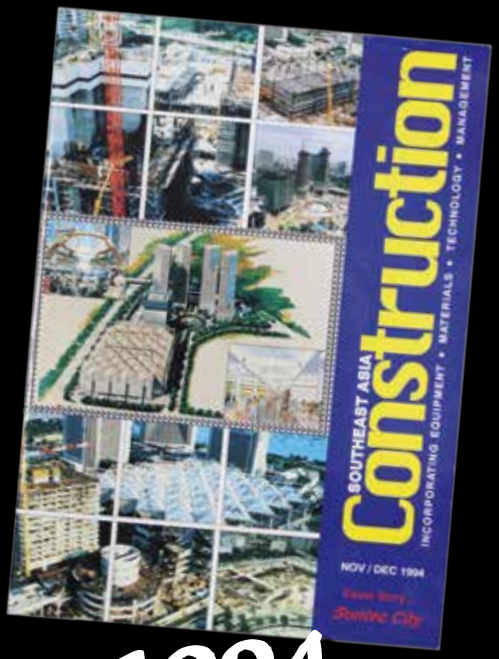
SEAC celebrated its 20th anniversary in 2014, marking another milestone in the magazine's beautiful journey. So we would like to send a huge thank you to our readers, advertisers, contributors, partners and all of the people who have been involved along the way. Because YOU are the ones who have made it possible and kept us going.

We would also like to take this moment to show you how far we have come. In this page and the following pages you will find 20 years of SEAC magazine covers, starting from 1994.

We hope that you continue to enjoy reading SEAC as much as we enjoy bringing you the latest developments in the construction industry across the Asia Pacific region.

Once again, thank you everyone for sharing this exciting journey with us. Let's now raise our glasses and have a toast! Here's to the next 20 years!

The SEAC Team



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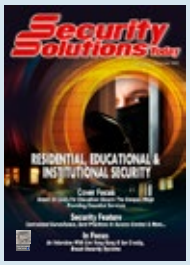

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Editor

Happy Birthday to my favourite magazine! You've been growing wonderfully for the past 20 years, making us really proud. I hope that you continue to become a source of inspiration for the industry in decades to come, and never lose the enthusiasm and spirit that makes you so great.

I'd also like to thank everyone for their support and loyalty throughout the years - our readers, advertisers, contributors, partners and all of those who have helped turn SEAC into the magazine it is today. Last but not least, many thanks to my team members for their hard work and dedication.

Cheers to an amazing future ahead!
#seac #20thanniversary

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eric ooi

Group Marketing Manager

Every journey starts with a single step. We started our journey with SEAC 20 years ago and have been enjoying every single step of it.

BIG THANK YOUs to our readers, contributors, advertisers, event organisers, and many wonderful people we meet at seminars and trade shows! SEAC wouldn't have made this far without your support!

Happy Birthday, SEAC! It has been 20 enriching years growing with you!
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felix ooi

Marketing Manager

I would like to extend my warmest greetings to SEAC for celebrating its 20th year as the leading construction publication in the Southeast Asia region.

We have featured many mega projects throughout the years, such as the Industrial Ring Road in Bangkok, Thailand; Bird Nest Stadium in Beijing, China; Gardens by the Bay in Singapore; Cooling Towers in Andhra Pradesh, India; and Klang Valley MRT in Kuala Lumpur, Malaysia, among others. Rest assured we will cover many more mega projects in the next issues to come.

Happy Birthday, SEAC! Keep up the great work and wishing you much success in the future!
#seac #20thanniversary

11:21 AM - 5 Dec 2014

318 RETWEETS **350** FAVORITES

jasmine gan

Assistant Marketing Manager

Happy 20th Birthday, SEAC!

Hearty thanks to our advertisers, readers and all of the people we have worked with for being so supportive of SEAC; you contribute the most to the success of SEAC today! *Applause*

Wishing SEAC to continue providing useful sources of information to the industry and perform even better in the future!
#seac #20thanniversary

12:21 PM - 5 Dec 2014

312 RETWEETS **335** FAVORITES

fawzeeah yamin

Head of Graphics Department

Congratulations and yay! Happy 20th Birthday, SEAC! Wishing you to celebrate all the inspiring things that make it special for 2015!

Thanks to everyone who has contributed and given full support to the magazine. May SEAC soar higher and stand tall like a crane for a concrete future ahead!

Thank you for this wonderful opportunity to be part of the SEAC Team! Be blessed!
#seac #20thanniversary

1:21 PM - 5 Dec 2014

225 RETWEETS **259** FAVORITES

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