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NOVEMBER - DECEMBER 2015

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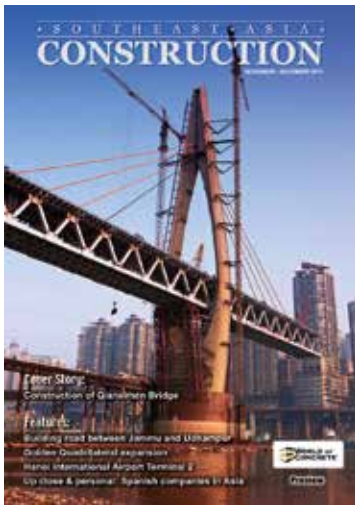
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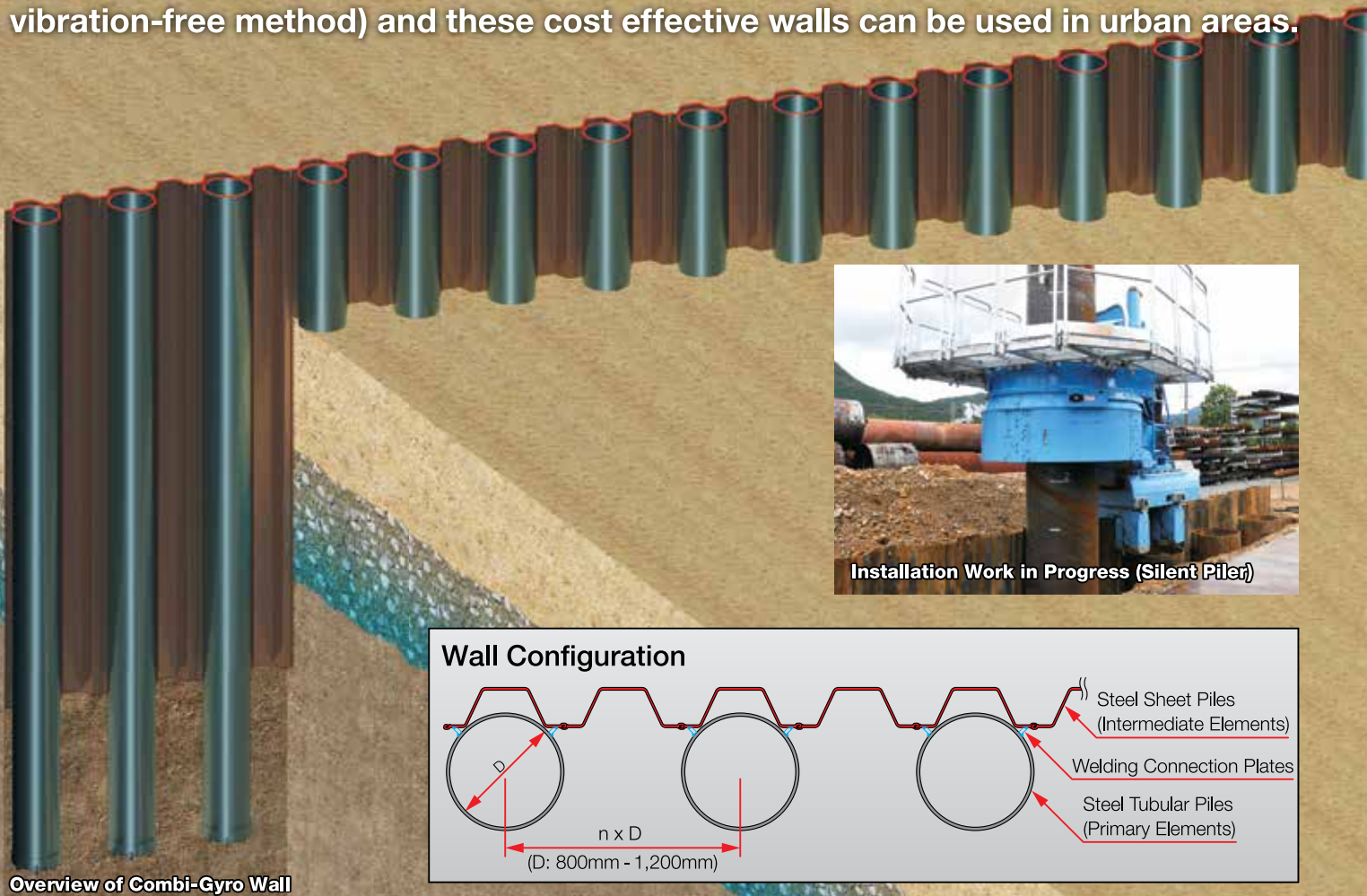
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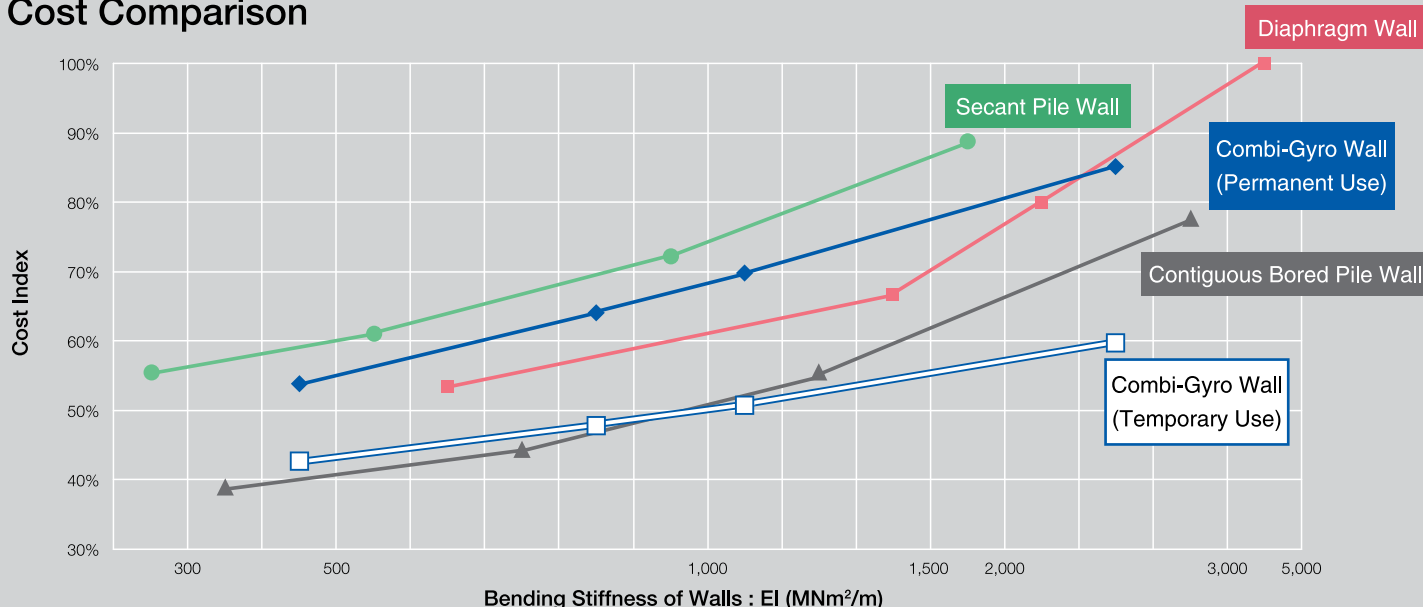
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Cost Comparison



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Vietnam's new iconic building

Construction has begun on the Vincom Landmark 81 - a supertall skyscraper located in Ho Chi Minh City, Vietnam. Atkins is the lead architect working closely with Arup for the structural design.

With an expected height of 460 m, Vincom Landmark 81 is set to be the tallest building in Vietnam once completed. The development is located in Vinhomes Central Park, one of the most prime locations in Ho Chi Minh City. Its frontage faces the Saigon River, and is conveniently connected via major road and water transportation. Atkins' scope includes architecture and landscape design.

The construction of Vincom Landmark 81 is expected to be completed in 2017. The 241,000 sq m mixed-use development will feature hotel, serviced residential apartment and retail space. ■



With an expected height of 460 m, Vincom Landmark 81 is set to be the tallest building in Vietnam once completed.

LafargeHolcim completes Indonesia plant project

LafargeHolcim has completed its Tuban project in Indonesia with the official opening of the second kiln line at the cement plant. This new plant will allow LafargeHolcim to tap into key developing markets in Indonesia's East Java province.

The Tuban plant allows for the highly efficient production of cement and better distribution. The plant has an annual cement capacity of 3.4 mil t and is located in eastern Java, around 200 km from the

city of Surabaya. The cement mill of the first line was put into commercial operation in December 2013 and the kiln followed in September 2014.

The Tuban plant has been designed to set new benchmarks in health and safety, low-cost production and environmental performance, while delivering reliable supply of vital building materials to Indonesia's growth markets and providing high quality services to its customers. ■

BASF opens representative office in Myanmar

BASF has opened a representative office in Yangon, Myanmar. This marks the company's first direct presence in the country.

Located at the Sedona Hotel building along Kabar Aye Pagoda Road, BASF's Myanmar office has been established to support its growing base of local customers and cater to an increasing demand for high quality and sustainable chemical products and solutions in the country as it develops.

BASF aims to support Myanmar in managing the challenges associated with rapid development and urbanisation. "Many

of Myanmar's most promising industries depend on chemistry to realise their full potential. BASF offers solutions that can help produce better yields in agriculture, affordable higher-quality buildings, clean water and better nutrition, and more sustainable manufacturing and mining. With a representative office in Myanmar, we can support our customers directly as they expand and develop their businesses," said Boonchai Opas-iam-likit, group MD of Thailand, Vietnam, Cambodia, Laos and Myanmar, BASF. ■

Black & Veatch helps Indonesia tackle remote power challenges

The Indonesian government plans to build new power plants throughout the country, some of which will be mobile, bringing electric power to people currently without access to the grid. PLN, the national electricity utility, will work on the project together with Black & Veatch.

The project forms part of the government's plan to fast-track 35 GW of electric power development by 2019. By 'clustering' these similar projects together, PLN is accelerating the delivery of about 50 plants across different locations. The plants will vary in size, configuration and operation, although common design opportunities will be explored and maximised such as technology type, size range and portability.

"We are working on an aggressive schedule to prepare a cluster of conceptual designs for the plants. Our work helps PLN go to market at an earlier stage than before and shortlist qualified suppliers and contractors. The approach will cut months off a typical planning and delivery schedule," said Tariq Aziz, South Asia, director, energy services, Black & Veatch, who is based in Jakarta.

The project is working through what is called the 'conceptual design' stage, and Black & Veatch has been appointed by PLN to provide engineering services to accelerate the project. Ranging from approximately 5 to 100 MW, smaller plants will start generating much needed power for the public from mid-2016. Remaining larger plants are set to commence operations by 2018.

Bringing power to remote locations presents many challenges. The plants will be fuelled by a combination of diesel and LNG (liquefied natural gas) because both fuel sources are more easily transportable by sea or road compared to other traditional fuel sources.

Therefore, the plants will have dual-fuel combustion turbines and dual-fuel fired gas engines. A number of the plants will also be mounted on barges and on trucks to allow relocation and flexibility of electricity supply. This solution has been put to use in other countries such as the Philippines, according to Black & Veatch.

The site locations for the power plants will be announced once conceptual designs and other matters are appropriately resolved. ■

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New demo-scale plant to test technologies for future Tuas WRP

Singapore's national water agency PUB is building a demonstration-scale Integrated Validation Plant to test the technologies that could potentially be implemented at the future Tuas Water Reclamation Plant (WRP). These technologies are aimed at enhancing cost savings and energy efficiency of the used water treatment process at Tuas WRP.

Slated for completion in February 2017, the demonstration plant will allow PUB to validate the efficacy of the new process innovations planned for the future Tuas WRP. The tender for the plant was recently awarded to Mitsubishi Corporation. Mitsubishi Heavy Industries Asia Pacific Pte Ltd (MHI-AP) has been contracted by Mitsubishi Corporation to undertake the construction of the plant.

Located within PUB's Ulu Pandan WRP, the demonstration plant with a capacity of 12,500 cu m a day will be designed to be a fully automated plant to reduce the manpower required to operate the plant. The demonstration plant will also serve as a training ground for the operators and to validate parameters for optimum used water treatment.

The future Tuas WRP will incorporate technologies to improve energy efficiency and manpower requirements. It is the key component of the Deep Tunnel Sewerage System (DTSS) Phase 2, a superhighway for the collection, treatment, disposal and reclamation

of used water. Phase 2 of the DTSS will extend the system to cover the western parts of the island.

"The treatment and subsequent reclamation of used water is a cornerstone in ensuring a sustainable supply of water for Singapore. The demonstration plant is a living model of the future Tuas WRP to allow us to test and validate the new technologies that will eventually be used at the Tuas WRP. These new and tested technologies will enable Tuas WRP to be more eco-friendly, produce less sludge and have the capability of producing more biogas for power, while consuming lesser energy than conventional plants," said Harry Seah, chief technology officer at PUB.

MHI-AP and PUB signed a Memorandum of Understanding (MOU) during the Singapore International Water Week in 2012, which saw them collaborating on a test-bedding project to treat high strength industrial used water at Jurong WRP. MHI-AP will continue to cooperate with PUB on R&D projects for water sustainability.

MHI-AP will be working closely with Mitsubishi Corporation to provide engineering support from the construction to the commissioning and operational phase of the project. It will also receive support from MHI (Mitsubishi Heavy Industries Ltd) Technology & Innovation Headquarters and an MHI group company, Mitsubishi Heavy Industries Mechatronics Systems Ltd (MHI-MS). ■

CapitaLand to develop new residential project in Vietnam

CapitaLand, through its wholly owned subsidiary, CapitaLand (Vietnam) Holdings has entered into a joint venture with Thien Duc Trading-Construction Company Limited to develop a prime site in Ho Chi Minh City, Vietnam. CapitaLand, as the lead development manager, plans to develop the site into an upscale residential development with approximately 1,000 homes. The development will have an estimated total project value of US\$150 million.

The 2.6-ha site is well located in Thanh My Loi ward in District 2, at the fringe of the city centre. It is 10-minutes away from the future central business district in Thu Thiem peninsula, as well as an important transportation network which includes Long Thanh-Dau Giay Highway, East-West Highway and Hanoi Highway. ■



The Vista, one of CapitaLand's residential projects in Vietnam.

ADB supports Timor-Leste road upgrading project

The Asian Development Bank (ADB) will provide an additional fund of nearly US\$12 million for the Timor-Leste Road Network Upgrading Project. The fund will be used to upgrade a 5-km section of road along a key route linking Dili to Tibar Bay - site of the country's planned new international port - to Gleno, centre of an important coffee-growing region. The original project supports road upgrades from Tibar Bay to Gleno and Liquica. The latest section targeted for improvement is part of the key north coast road linking Dili with Indonesia, as well as the western towns of Maliana and Bobonaro.

The Road Network Upgrading Project also includes upgrading from Tibar to Liquica and complements another road initiative funded by an ADB grant, which together will upgrade 57 km of roads from Tibar to Batugade, on the border with Indonesia. According to ADB these are the first major road improvements to be undertaken by Timor-Leste since independence in 2002. ■



A road in Timor-Leste.



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Guangxi's latest skyscraper

DennisLauandNgChunManArchitecture & Engineers (HK) Limited (DLN) has revealed its designs for Guangxi's latest skyscraper, Nanning Logan Century, which will feature as an iconic landmark at the centre of the ASEAN Business District. The 383-m-high skyscraper occupies over 396,490 sq m of floor area incorporating Grade-A office space, a luxurious international five-star hotel and a premium shopping mall.

DLN also incorporates the innovative design of a 2,000 sq m business skypark, with outdoor podium and green space to form a recreational and social area for corporate executives.

Nanning is known as the political, economic and cultural centre of Guangxi, and is the core city of the Beibu Gulf Economic Zone. The ASEAN Business District is currently one of the chief urban districts in China that integrates a central business district, consulates and foreign correspondence headquarters in one area.

The phased development commenced in 2013, and has been an ongoing project to meet the rapid development in Nanning as well as the vast region of southern China. The project is targeted for completion in 2017. ■



The upcoming Nanning Logan Century at the ASEAN Business District.

Investment in residential and infrastructure markets to support Japan's construction industry

Despite Japan's construction industry having contracted by 1.6 percent in real terms in 2014, the industry's value is expected to pick up over the forecast period (2015–2019). Growing investments in residential and infrastructure markets will support this trend, according to Timetric's Construction Intelligence Centre (CIC).

Japan's construction growth is likely to be supported by factors such as low unemployment rates, investment in public transport infrastructure, improvements in consumer and investor confidence and positive developments in regional economic conditions.

Residential construction was the largest market in Japanese construction in 2014, accounting for 32.9 percent of the industry's total value. Timetric predicts that it will maintain its share of the market over the forecast period.

According to the United Nations Department of Economic and Social Affairs (UNDESA), the country's urban population is expected to reach 94.1 percent by 2020, rising from 115.3 million in 2010 to 119.4 million in 2020.

"The country's growing urbanisation

will create fresh demand for the residential construction market over the forecast period. Consequently, we can expect market output to record a CAGR of 2.25 percent in nominal terms over the forecast period, to value JPY20.7 trillion in 2019," said Sina Zavertha, economist at Timetric.

Infrastructure construction accounted for 28.2 percent of the construction industry's total value, which made it the second-largest market after residential construction. Growth in the country's infrastructure development over the next five years will be driven by investments in public transport infrastructure, such as the construction of the JPY5.5 trillion ultra-high speed magnetic levitation (maglev) train line and the JPY10 billion Kansai international airport expansion project.

Overall, Japan's construction industry is expected to record a real CAGR of 1.2 percent over the forecast period (2015–2019), rising from US\$600.2 billion in 2014 to US\$637.4 billion in 2019. However, there are risks to the positive outlook for construction industry growth in Japan associated with rising labour and construction materials costs. ■

Atkins wins contract for key interchange station in Hong Kong

Atkins has been appointed as the contractor designer to provide design services for the excavation and related temporary works procedures in the construction of the Shatin to Central Link (SCL) Exhibition Station and Western Approach Tunnel in Wan Chai, Hong Kong. Upon its completion, Exhibition Station will become the interchange station for the SCL North South Corridor and the future North Island Line, and will support the expansion of the harbour front of Wan Chai North.

Appointed by Leighton-China State Joint Venture, the major scope of Atkins' work includes technical detailed design services for the temporary excavation and lateral support (ELS) construction. The project will involve a deep temporary excavation of an area approximately 30 m in depth below ground.

Atkins has designed a comprehensive temporary traffic management scheme to mitigate potential impacts on the nearby community and facilitate the staged underground station structure construction.



Atkins has secured a contract to design temporary work for Shatin to Central Link (SCL) Exhibition station and Western Approach Tunnel.

In addition, Atkins will provide impact assessment on nearby existing buildings and utilities, conduct geotechnical instrumentation and monitoring for ground movement during construction, and provide dewatering and pumping system to facilitate the excavation.

The North South Corridor of the SCL is expected to be commissioned in 2021. ■



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Construction begins on IMX corporate campus in Shanghai

Construction has begun on the IMX (International Merchandise Exchange) corporate campus located in Hongqiao central business district in Shanghai, China. Atkins provided detailed design and facade design for the buildings.

With a gross floor area of 165,000 sq m, the project is located at the heart of the overall IMX masterplan. A variety of high quality office facilities that incorporate contemporary and flexible office layouts with the latest video conferencing technologies are planned. The project will set a new standard for the corporate campus sector in integrating transport, building layout and modular architecture.

Atkins has been working in partnership with King Wai Group on IMX project as the project masterplanner since 2013. The construction is expected to be completed in 2016.

In addition, Atkins has won a contract to create a concept masterplan for an area fit to host a world-class flower exhibition in Nanchang, the capital city of Jiangxi province in China. The 1.9 sq km development, which is located in Qingyunpu District, will be made up of three core areas including the Bada Shanren MeiHu cultural zone, the Flower Expo and a commercial zone. Specific buildings will include a five-star hotel set within a multi-themed garden environment and a floral science and technology museum. The use of solar photovoltaic and wind power, as well as ecological water conservation, will assist in achieving the environmental objectives.

The plan supports Jiangxi's development as part of the national Silk Road economic belt and promotes the growth of cultural tourism



Construction of the IMX corporate campus in Hongqiao central business district has recently started and is expected to be completed in 2016.

industry across the province. Aiming to create a world-class cultural tourism destination that integrates commercial, business and residential, the development will help improve the local economy by creating jobs and stimulating consumption. Work has already begun on the project, and is scheduled to be completed in time for the flower exhibition in September 2016. ■

Nepal's Koshi Bridge opens

The new Koshi Bridge in Chatara, Sunsari District, Nepal, has been opened to the public. It aims to restore mass connectivity and economic activities in the eastern development region and directly benefitting the districts of Sunsari, Saptari and Udaypur. The bridge was built with financial assistance from the Asian Development Bank (ADB) as an alternative to the Koshi Barrage, which was badly damaged by the monsoon floods of 2008. The 261.3-m-long and 7.5-m-wide bridge was built at a cost of US\$11 million, as a part of the Emergency Flood Damage Rehabilitation Project.

"The Koshi Bridge serves as an important strategic link in expanding transport connectivity within the country and beyond, including with India and Bangladesh. This reduces future risk from similar flood disasters, and is an application of the concept of build back better," said Kenichi Yokoyama, ADB's country director for Nepal. "With mutual efforts by the government and ADB, the bridge was completed within the scheduled time of three and half years and the project is now successfully completed by restoring livelihoods and building resilience."

"As an alternate route, the bridge not only ensures the East-West highway is passable year round, but it also directly benefits the people of Udaypur, Saptari, Khotang, Sunsari and Dhankuta," said Tulasi Sitaula, secretary of the Ministry of Physical Infrastructure and Transport. "The bridge will also open economic growth opportunities by connecting the two important business hubs of Dharan in the east, and Hetauda in the central region."

The Emergency Flood Damage Rehabilitation Project was approved by ADB on 21 April 2009 with a grant of US\$25.6 million. The project has built key infrastructure such as roads, bridges and



The new Koshi Bridge in Nepal was built with financial assistance from ADB as an alternative to the Koshi Barrage, which was badly damaged by the monsoon floods of 2008.

irrigation channels, and undertaken landslide stabilisation work to avoid similar disasters in the future. Agriculture produce collection centres and marketplaces were also reconstructed.

The project has restored vital lifelines for more than 300,000 people seriously affected by the 2008 floods in Kailali, Kanchanpur and Sunsari. The Ministry of Physical Infrastructure and Transport executed the project and the Department of Roads implemented the bridge subproject. ■

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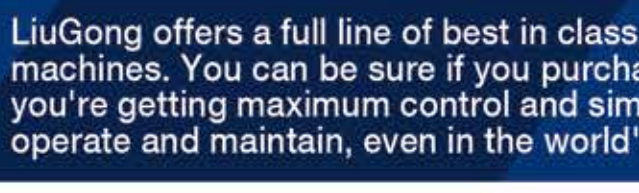
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Terex and Konecranes team up

Terex Corporation and Konecranes Plc plan to combine and create a single company, Konecranes Terex Plc, which will be incorporated in Finland. This merger will bring together two complementary leaders in cranes, materials handling and equipment servicing solutions to create a premier industrial company.

The combined company is expected to create enhanced shareholder value in a variety of ways, including increased global scale with enhanced competitiveness to rival low-cost emerging market players; broader presence in key sectors with greater opportunity to capitalise on growth trends in the port and industrial sectors as well as services; more robust portfolio of complementary products and customer solutions; critical scale for further technology development and enhanced R&D; significant operational and corporate synergies and complimentary geographic profiles; and strong balance sheet and cash flow generation to support growth and return of capital to shareholders.

Upon close of the transaction, the combined company will appoint nine directors comprised of five Terex directors and four Konecranes directors. The Konecranes chairman and the Terex CEO will become, respectively, the chairman and the CEO of the combined company at closing. The combined company will also maintain significant headquarters in Westport, Connecticut, USA and Hyvinkää, Finland.

Terex Corporation restructures

Tim Ford, currently president of Terex Cranes, is leaving the company to pursue other opportunities. With this, Ken Lousberg, currently president of Terex China, will take on the role of president of Terex Cranes as well as the responsibility for Latin America previously with Mr Ford.

While Mr Lousberg will retain responsibility for China, a country leader for the Chinese business will be named as soon as possible. Mr Lousberg joined Terex through the Genie acquisition in 2002 and has held several senior management positions at various Terex operations.

George Ellis will take on a new role as senior vice president for operations planning and president of Terex Construction. In addition to retaining his current responsibilities for Terex Construction, government programs and India, Mr Ellis will assume global responsibility for the Terex Business System, sourcing, transportation, logistics and manufacturing footprint. Mr Ellis also joined Terex through the Genie acquisition in 2002 and has held several senior management positions at various Terex operations.

Scott Hensel, now vice president of Terex Services North America has been named to the newly created position of vice president and managing director of Terex Utilities and Services reporting to Mr Lousberg. In this new role, apart from his current responsibility for managing and growing the North American services business, Mr Hensel will also have management responsibility for the Terex Utilities business. He was previously a partner at McKinsey & Company and joined Terex in 2014 to improve and grow the Terex Services North America business.

Kieran Hegarty, president of Terex Materials Processing will assume management responsibility for the Terex Fuchs business which will become part of the Terex Materials Processing segment.

Ron De Feo, Terex chairman and CEO, commented, "While we expect to achieve substantial synergies with the announced merger with Konecranes, as we think ahead and help position the company for the merger we must continue to organise the company and operate Terex in a way that is best for the business." ■

Infrastructure works on Tours-Bordeaux HSL project completed

Vinci has completed earthworks and civil engineering works for the 340 km Tours-Bordeaux high-speed rail, also known as South Europe Atlantic high-speed rail. The line, which includes 40 km of connections to the conventional rail system, represents a total investment of €7.8 billion and constitutes the largest railway sector public private partnership ever signed in France and one of Europe's largest infrastructure projects. Following the six years required to design and build it, the line is expected to shorten the travel time between Bordeaux and Paris to two hours and five minutes. Work got under way in the first half of 2012 and the line is scheduled to begin commercial operation in 2017.

COSEA is the construction joint venture responsible for designing and building the project, which took only 38 months to complete all earthworks and civil engineering works. Over the three-year period, the construction teams set up a large number of worksites along the alignment to build the 340 km rail infrastructure, 24 viaducts and 500 engineering structures. The record completion time made it possible to hand over the roadbed ahead of schedule to the teams in charge of installing the rail equipment, who are now progressing at a rate of 2 x 650 m of platform per day.

The project was carried out in consultation and in partnership with the local stakeholders. In environmental terms, Vinci's teams worked day-to-day with non-profit organisations to optimally blend the infrastructure into its environment. In social terms, COSEA, Pôle Emploi (the French job centre) and the local authorities also worked



© Vinci

The earthworks and civil engineering works for the 340 km Tours-Bordeaux high-speed rail line have been completed.

closely together to recruit and train 2,000 local workers, who joined the 6,500 employees of the partner companies. Among other things, this partnership arrangement made it possible to exceed the initial target work integration objective, nearly doubling the number of work integration hours to 4.5 million of the 25 million total hours worked. Three-quarters of the people recruited locally for the infrastructure project were redeployed to the railway project or outplaced, notably via the Fondation COSEA pour Entreprendre (COSEA Enterprise Foundation), which supports business creation. Lastly, the project was exemplary in terms of safety, recording no accidents with serious consequences throughout the 25 million hours worked. ■

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Terex Trucks invests in aftermarket team

Manuel Nemer has been appointed as Terex Trucks' regional aftermarket commercial manager for the Americas region. He will be based in North Carolina, the US. During 14 years in various aftermarket roles, Mr Nemer has worked with Volvo Mexico and Macks Trucks, supporting North and Latin America. He has extensive knowledge and experience in the Americas region, as well as fluency in English and Spanish.

Paul Culliford has been appointed as Terex Trucks' regional aftermarket business development manager for Europe, Africa and Russia CIS. He is based at the company's headquarters in Motherwell, Scotland. Mr Culliford worked with Terex Corporation for 12 years supporting dealers globally, with a focus on emerging markets. He is fluent in English, Spanish, French and German, and has extensive aftermarket experience.

Mr Nemer and Mr Culliford are both responsible for working with dealers to develop parts business, and to maximise revenues in their regions.

Joe Sottosanti has been appointed as Terex Trucks' regional



Manuel Nemer.



Paul Culliford.



Joe Sottosanti.

customer support manager for the west coast of America, drawing on 20 years' experience in off-highway trucks in the US and Latin America. Mr Sottosanti is based in Fort Worth, Texas, the US and will be working closely with dealers to maintain customer satisfaction in Terex Trucks products and services. He is supporting Nick Love, head of customer support. ■

Sennebogen expands Straubing plant

Sennebogen is extending its production and warehouse areas at its site at the port of Straubing, Germany, by around 35,000 sq m. A new 6,700 sq m production shop is also being built for the assembly and painting of large components and for finishing work and quality control. With this investment, the company is preparing itself for future projects, expanding its capacity for the production of large machines.

Sennebogen opened its second plant in Straubing back in 2008. This plant II is primarily used for the manufacture and testing of large machines with an up to 300 t operating weight. In order to accommodate the growing need for space and to increase capacity for future production requirements, the factory premises are being expanded in two construction phases starting in mid-2015.

During the first phase, a paved surface is being built south of the current premises for the technical approval of telescopic cranes and rope excavators and for a new noise metering area. A new and spacious shipping area for machines and components is also part of the project. During the second phase, a new assembly and paint shop



Sennebogen is expanding its plant II in Straubing, Germany. Work on the first phase has already started.

for large machines will be built by the end of 2016.

Work on the first phase has already begun, and the second phase is scheduled to start in mid-2016. ■

Hubbard Construction secures four road infrastructure projects in Florida

Eurovia's US subsidiary Hubbard Construction has won four road infrastructure contracts in Florida, the US, with a combined value of nearly US\$200 million. These projects are part of the state's US\$10 billion Florida Transportation Plan unveiled in January 2015, which will help accelerate the state's economic growth.

One of the contracts is for widening of State Road 528 in Orlando. This project involves widening a 6.5 km section of expressway from Florida's Turnpike to I-4. It also includes widening of six bridges, comprehensive refurbishment of two bridges and construction of two new access bridges.

Another contract is for the lane upgrades on International Drive in Orange County, a major artery in Orlando. The project includes

recycling of 16 km of lanes, construction of 8 km of additional lanes and development of pedestrian bridges. Landscaping, drainage, road sign and road marking works are also included.

In addition, Hubbard Construction will supply more than 1 mil t of asphalt mix for the 'I-4 Ultimate Improvement' project in central Florida, which it will also place. The project comprises renovation and widening of the 24 km section between Orlando and Longwood, which will in places be widened to 10 lanes, including four toll express lanes.

Hubbard Construction will also reconstruct and widen a 2.4 km section of Florida State Road 21 (between McMeekin and Jacksonville in northern Florida). The goal of this project is to improve the flow of traffic on the particularly busy section. ■

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12 Nov 2015	Concrete Floors Asia's Live Mega Demo 2015 Ho Chi Minh City Vietnam	Concrete Floors Asia Sdn Bhd Tel: +603 777 22777 Email: inquiry@concretefloorsasia.com Website: www.concretefloorsasia.com
25 to 29 Nov 2015	Excon 2015 Bangalore International Exhibition Centre Bengaluru, Karnataka India	Confederation of Indian Industry Tel: +91 97898 08994, Fax: +91 44 4244 4510 Email: excon@cii.in Website: www.excon.in
3 to 5 Dec 2015	Myanbuild 2015 Myanmar Event Park Yangon Myanmar	AMB Events Group Tel: +95 9798435634, Fax: +95 1 254765 Email: darren@ambexpo.com Website: www.myanbuild.net
20 to 22 Jan 2016	BuildTech Mandalay 2016 Mandalay City Hall Mandalay Myanmar	Sphere Exhibits Pte Ltd Tel: +65 6319 4037, Fax: +65 6319 6140 Email: btyangon@sph.com.sg Website: www.btmandalay.com
16 to 20 Mar 2016	Worldbex 2016 World Trade Center Metro Manila Manila Philippines	Worldbex Services International Tel: +632 656 9239, Fax: +632 477 1899 Email: info.worldbex@gmail.com Website: www.worldbex.com
9 to 10 May 2016	Trenchless Asia 2016 Kuala Lumpur Convention Centre Kuala Lumpur Malaysia	Westrade Group Ltd Tel: +44 845 094 8066, Fax: +44 870 429 9275 Email: pharwood@westrade.co.uk Website: www.trenchlessasia.com
17 to 19 May 2016	Coat & Corrosion Asia 2016 Putra World Trade Centre Kuala Lumpur Malaysia	ECMI ITE Asia Sdn Bhd Tel: +603 8023 0820, Fax: +603 8023 0830 Email: enquiry@ecmi.com.my Website: www.coatcorrosionasia.com
14 to 16 Jul 2016	LankaBuild 2016 Sri Lanka Exhibition & Convention Centre Colombo Sri Lanka	AMB Events Group Tel: +603 4041 9889, Fax: +603 2770 5301 Email: suraya@ambexpo.com Website: www.lankabuild.org
22 to 25 Nov 2016	Bauma China 2016 Shanghai New International Expo Centre Shanghai China	Messe München GmbH 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
23 to 26 Nov 2015	PMV Live at The Big 5 2015 Dubai World Trade Centre Dubai UAE	dmg events Tel: +971 4 445 3655, Fax: +971 4 438 0356 Email: firasabouttaif@dmgeventsme.com Website: www.pmvlive.com
2 to 5 Feb 2016	World of Concrete 2016 Las Vegas Convention Centre Las Vegas, Nevada USA	Informa Exhibitions Tel: +1 972 536 6379 Email: info@worldofconcrete.com Website: www.worldofconcrete.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
22 to 25 Feb 2017	Samoter 2017 Verona Exhibition Centre Vrona Italy	Veronafiere Tel: +39 045 829 8111, Fax: +39 045 829 8288 Email: info@samoter.com Website: www.samoter.com



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bauma prepares for 2016 show

The next bauma will return from 11 to 17 April 2016 at the Messe München exhibition centre in Munich, Germany. It is expected to occupy a total of 605,000 sq m of space.

According to the show's organiser, Messe München, as of April 2015, almost 3,000 exhibitors from over 50 countries have applied to take part. The top 10 countries of origin among the exhibitors (after Germany) are currently Italy, Turkey, the Netherlands, Spain, the UK, the US, Austria, France, Sweden and Switzerland. Several international country pavilions will also be participating, namely Brazil, China, Czech Republic, France, Great Britain, Italy, Korea, Northern Ireland and the US.

"The response from the exhibitors and the high level of demand for space are truly amazing," said Klaus Dittrich, chairman and CEO of Messe München. "Of course we want to give as many companies as possible the chance to be present at bauma. Yet because of this high level of demand, we will unfortunately not be able to meet all requests for space and participation."

The last bauma in 2013 - with a total of 3,421 exhibitors from 57 countries and 535,065 visitors from over 200 countries - broke all previous records. ■

Website: www.bauma.de



Above and below: The last bauma in 2013 attracted a total of 3,421 exhibitors from 57 countries and 535,065 visitors from over 200 countries.



Construction Expo 2016 to focus on solution for Brazil's municipalities

Sobratema, the Brazilian Association of Technology for Construction and Mining, has chosen 'Cities in Motion - Solutions in Construction for Brazil's Municipalities' as the core theme for its third edition of Construction Expo, which will be held in June 2016 in São Paulo, Brazil.

The show is expected to gather over 20,000 visitors including leaders, managers and engineers from construction companies, draftsmen/designers and architects, public managers, administrators and representatives of municipal governments from cities all over Brazil, as well as other professionals associated with urban infrastructure.

Construction Expo is supported by 135 industry associations and many of Brazil's construction companies. The Thematic Exhibit Halls will showcase materials, services, equipment, solutions, brands and companies in an integrated and interactive manner. The Construction Expo 2016 Congress will present a wide range of talks and workshops, promoting discussions on the needs of improvements in urban infrastructure. The congress will also address technical issues and topics of critical importance to infrastructure, such as accessibility, mobility, housing, sustainability, water and sanitation, public recreational areas, etc. ■

Website: www.constructionexpo.com.br



Above and below: The next Construction Expo will return in June 2016 in São Paulo, Brazil, with the theme 'Cities in Motion - Solutions in Construction for Brazil's Municipalities'.



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Skanska managers complete MEWPs for Managers course

Twenty managers from Skanska Romania have successfully completed the IPAF MEWPs for Managers course, which enables supervisors and managers to prepare for and safely coordinate the use of various types of mobile elevating work platforms on site.

The course was conducted by IPAF-certified instructor Martin Wraith and was organised by and held at IPAF member rental company Industrial Access Romania, which won an International Award for Powered Access (IAPA) as Access Rental Company of the Year 2013.

One of the managers who attended the course, Mircea Bosie, Environmental, Health & Safety (EHS) coordinator at Skanska Romania, said, "The structure of the training module was good and allowed us to enter step by step into the subject, without bringing a huge amount of information all at the same time. The content of the training was very clear, easy to understand by everyone, and it was presented in an interesting way with the use of videos, case studies and animations. The biggest plus was the instructor who was very well prepared and delivered the course effectively."

IPAF's MEWPs for Managers course is available from approved training centres worldwide in English, German, French, Italian, Dutch, Spanish and Portuguese. The one-day course is not about operating equipment, but about planning, supervising and effectively managing the use of MEWPs on site. It ends with a written test that candidates must pass in order to obtain a certificate. ■



Above and below: Managers from Skanska Romania attend the IPAF MEWPs for Managers course.



Seminar on MEWP technical standards

IPAF held a members' seminar during the recent BICES exhibition in Beijing, China, which brought delegates up to date on technical and design standards relating to MEWPs from across the world. This was an opportunity to hear from IPAF's experienced team of technical experts who are involved in the development of safety standards for the industry within their regions.

Speakers included Tony Groat, IPAF's representative in North America, who has a significant role in the CSA and ANSI AWP standards committees, including the chair of the B354.7 safe use and B354.8 training standard subcommittees and the chair of the new ANSI A92.22 standard subcommittee; Bai Ri, IPAF's representative in China, who is an experienced member of the SAC TC 335, involved in discussing and drafting standards for elevating work platforms; and Chris Wraith, IPAF's technical and safety executive based in the UK.

Updates were provided on the ANSI (US) and CSA (Canada) standards, the GB (China) standards and the EN (European) standards. ■



IPAF recently joined the BICES exhibition in Beijing, China.

Exiting safely at height

IPAF has released updated guidance E2 on exiting the platform at height. The document states that MEWPs are specifically designed to lift people to a position where they can work at height safely within the platform and that MEWPs are not designed for the purposes of transfer or exiting at height. Thus, people should only enter or exit the work platform at access positions at ground level or on the MEWP chassis.

The document outlines criteria for exceptional cases where MEWPs may be used to gain access to or from a work area at height, where exiting the platform at height may be permitted, what hazards should be considered in the risk assessment, and what control measures should be taken. ■



Guidance illustrates the correct way to exit the platform at height where necessary.



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XCMG unveils new 'intelligent' excavator

The new XE15R hydraulic 'intelligent' excavator is the first fully remote-controlled excavator from XCMG. Featuring no cab, it is the company's smallest excavator at 1.08 m in width and 1.35 m in height - it is nicknamed 'Little Swan'.

The XE15R is easy to manoeuvre and very flexible in challenging working conditions. It has a wireless control function with a 100 m range, and integrates mechanic, electronic and hydraulic control technology with a CAN bus interface design. Unmanned driving reduces labour intensity, which is particularly useful in severe operating environments such as toxic conditions or extreme temperatures.

The XE15R is also equipped with a self-learning function. It can save operating manoeuvres and then replay them automatically on request, further ensuring safety and reliability in operation.

At present, XCMG's excavator series ranges from 1 to 400 t. The company



The new XCMG XE15R hydraulic 'intelligent' excavator is a fully remote-controlled machine.

said it will continue to look into smart manufacturing and intelligent products for

future developments. ■

Website: www.xcmg.com

Tsurumi submersible heavy-duty agitator pumps

Tsurumi's new heavy-duty, high-powered agitator GSD pump is powered by a 37 to 75 kW motor. It features the highest head and volume among Tsurumi slurry pumps.

The impeller, agitator and mouth ring on the GSD pump are made of high-chromium cast iron to ensure longer use against wear. Furthermore, performance drops due to wear have been minimised by combining a closed impeller configuration with a mechanism that continuously adjusts the clearance between the mouth ring and impeller.

The GSD pump is also equipped with seal pressure relief ports that release pump pressure applied to the mechanical seal, thus enhancing reliability in extended use.

In addition, the Tsurumi GPN pump is fitted with a 5.5 to 22 kW motor. Like the GSD series, the GPN pump's impeller, agitator and suction plate are also made of high-chromium cast iron. And if the impeller and suction plate wear down to the point of diminishing pump performance, the plate can be replaced or its gap from the impeller adjusted.

Both the GSD and GPN pumps have an anti-wicking cable entry and inside mechanical seals with silicon carbide faces. The pumps are ideal for use in harsh conditions at construction sites, mines, etc. ■

Website: www.tsurumipump.com.sg



The Tsurumi GPN series (above) is fitted with a 5.5 to 22 kW motor, while the GSD series with 37 to 75 kW.

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New XHT torque heads for foundation screw pile applications

The new XHT-series torque heads from Auger Torque are specifically designed for foundation screw pile applications. They are suitable for use with 24 to 50 t excavators. Auger Torque's range of alignment and torque monitoring devices are also compatible with these new torque heads.

The integral oil conditioning and Auger Torque's non dislodgement shaft (NDS) are two distinctive features that make the XHT torque heads stand out, prolong the service life of the attachment and increase workplace safety. Fitted on the XHT150 and XHT225 models, the NDS is a single piece drive shaft assembled top down and locked into the earth drill housing. This feature ensures the shaft will never fall out, thus enabling a safe work environment not only for the operator but also for any surrounding workers. In addition, Auger Torque's high quality hydraulic motors, output shaft bearings and the use of high grade materials result in a durable earth drill with a long, reliable service life. ■

Website: www.augertorque.com.au

Auger Torque's new XHT-series torque heads are suitable for 24 to 50 t excavators.



TEMP system from Inspection Instruments

Inspection Instruments recently introduced its new system for measuring, analysing and reporting temperatures generated by mass concrete pours. This TEMP (Thermal Evaluation of Mass Pours) system makes it simple and cost efficient to meet requirements of thermal control plans and monitor concrete maturity.

Concrete typically generates heat during hydration (curing), but when the volume of cement in a concrete placement is substantial, undesirable temperature effects may result. These placements are classified as 'mass concrete', and require 'thermal control plans' that include measuring temperatures at various locations inside the concrete pour during curing. Measured temperatures must remain within allowable limits.

TEMP measures concrete temperatures during curing in various locations of the pour using Thermal Wire cables, which feature custom-spaced digital temperature sensors. The cables are cast into the concrete, often tied to the reinforcement. The TEMP system is unique in making it possible to have multiple measuring points in a single Thermal Wire cable, allowing the design of each monitoring project with as few or as many temperature sensors per cable as required to minimise cost.

A single external TEMP data logger collects and stores temperature measurements of all sensors of the Thermal Wire cable. There are no batteries in the sensors themselves, only in the external TEMP data logger. This battery lasts 28 days, is rechargeable and easily replaceable when low, making it possible to monitor and store temperature data indefinitely. Data is transferred from the data loggers to the TEMP main unit for quick observation whenever desired – the main unit has a high-resolution screen visible in all lighting conditions.

Analysis and reporting is performed with the TEMP-S software, which makes it fast and intuitive to generate a customised presentation-quality report. It displays measured temperatures



The new TEMP (Thermal Evaluation of Mass Pours) system makes it simple and cost efficient to meet requirements of thermal control plans and monitor concrete maturity.

versus time in graphical and tabular forms, maximum and minimum temperatures, and the maximum temperature differentials (ΔT), along with allowable limits entered by the user.

TEMP-S calculates concrete maturity based on measured temperatures, and helps the user estimate concrete strength based on a user-determined strength-maturity relationship. The TEMP system allows users to comply with maturity monitoring requirements of ASTM C1074 – 11 Standard Practice for Estimating Concrete Strength by the Maturity Method.

Inspection Instruments is a wholly owned subsidiary of Pile Dynamics Inc, the global manufacturer of QA/QC instruments for deep foundations. ■

Website: www.inspectioninstruments.net

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Manitowoc launches new mobile and tower cranes

Manitowoc has developed new five-axle Grove all-terrain cranes, the GMK5180-1 and GMK5200-1, joining the recently launched GMK5250L. The new Grove cranes offer optimal boom and jib combinations, featuring a 64 m main boom which can be extended with two 8 m inserts and an 18 m swing-away jib with 40° offset. The 180t capacity GMK5180-1 has a maximum counterweight of 50t, and the 200 t capacity GMK5200-1 has a maximum counterweight of 70 t.

Together with the GMK5250L, the new Grove five-axle cranes are believed to be the first in the industry to offer a VIAB turbo retarder clutch, which eliminates both fluid overheating and clutch burning, while enabling wear-free starting and braking. It also contributes to fuel savings. And in common with new Grove launches, the GMK5180-1 and GMK5200-1 are powered by a single engine; this means lower fuel consumption during operation, reduced overall weight and less maintenance, making the crane far more economical.

As with the Grove GMK5250L, the new GMK5180-1 and GMK5200-1 offer excellent roadability, with a variety of axle load configurations, allowing the cranes to meet the requirements of virtually any market. Special attention has been given to the appropriate axle group spacing, and in countries where the local requirement is for axle loadings of up to 16.5 t (such as the UK), the cranes are able to move on the highway with up to 21 t of counterweight.

The five-axle cranes can be moved on the job site with their full counterweight, saving valuable project time that would otherwise be spent installing or removing sections. The counterweight slabs are interchangeable with other models, and the new Groves also benefit from their use of common parts found in other Grove cranes, optimising logistics and reducing transport costs for customers. In addition, the self-rigging auxiliary hoist introduced on the GMK5250L can be used on both new models.

On site movements are made easier with the inclusion of Grove's Megatrak independent suspension and the all-wheel steer system, which means no axles need to be lifted while moving – again, enabling the optimum amount of counterweight to be carried, supported by the active suspension control.

The new Grove cranes feature the Crane Control System (CCS), a user-friendly interface that Manitowoc is introducing on all new all-terrain crane models, as well as crawler cranes, rough-terrain cranes, truck cranes and tower cranes.

In addition, Manitowoc has launched its new Potain MDT City tower crane range, which features the CCS. The models include the MDT 109, MDT 139, MDT 189 and MDT 219, all evolutions of previous MDT City cranes, ranging from 55 to 65 m, and hoisting capacities from 6 to 10 t.

The MDT CCS City cranes allow complex multi-crane installations by considerably reducing the height gaps and interference of cranes on work sites. The assembly, erection, transport and even maintenance times are reduced, helping to keep operating costs low.

The CCS helps to get more work done faster, with great precision. And with CCS, it takes no more than 15 minutes to commission the crane on site, according to Manitowoc. Setting the limit switches, load limiter and moment limiter are all done on-screen from within the cab – increasing productivity and getting the crane to work faster.

Potain's premium Ultraview Cab, now equipped with the CCS, enhances driver ergonomics and comfort and provides more precise crane control. The new Potain Plus function enables driver versatility and productivity, offering precision control and increased load curves. In the Potain Plus mode, CCS limits dynamic effects by automatically



Above:
Grove
GMK5180-1
mobile crane.

Left:
Potain MDT
CCS City
tower crane.

adapting speed and acceleration to further optimise the load curve.

With the CCS, Potain tower cranes will meet or exceed applicable European safety standards. The system monitors itself in real time, ensuring proper operation of the crane, and a seat sensor prevents the crane from being operated unless the operator is present.

Manitowoc said that all Potain MDT, MD and MR range cranes will use the same cab and control systems, making them easier to commission, operate and maintain. The standardised cab and sensors also allow for improved efficiencies in spare parts.

An integrated diagnostics tool offers easy monitoring of the crane settings, operations and service maintenance. The system also features a remote function, CraneSTAR Diag, allowing technicians to monitor the crane at distance in real time. ■

Website: www.manitowoccranes.com



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First Giken F301 silent piler with hat type sheet pile in Singapore

The first Giken F301 silent piler with hat type sheet pile 900 in Singapore has been delivered to Avenue Engineering Pte Ltd, a civil engineering firm that specialises in road and drainage works.

The F301 silent piler is available in standard, water jetting and super crush mode by changing the chuck and chuck frame, and equipping attachments. The machine can be adjusted to suit various soil conditions and working environments.

The new control system manages the position of the press-in machine and controls load generation from press-in work during operation, maximising the durability of each part. In addition, control of the machine has been improved by the press-in force control system and phaseless linear auger torque control system.

The power unit of the F301 is designed to be environment-friendly, meeting strict requirements for clean emissions with high combustion efficiency and Giken's original hydraulic control technologies. The F301 also uses biodegradable Piler Eco Oil and Piler Eco Grease. Thus, if hydraulic oil or grease is spilled into soil or water, there is no environmental damage to the surrounding ecosystem.

The F301 silent piler with hat type sheet pile 900 can perform high quality installation. This is because of two main reasons: firstly, there are two press-in points and therefore, the press-in force can be transferred efficiently by gripping the pile with two points; secondly, the clamping reaction piles at interlock positions optimises the stability of the reaction base.

The hat type sheet pile 900 is manufactured by Nippon Steel and Sumitomo Metal, featuring a width of 900 mm and a height of 230 mm. The pile has high structural reliability, as no reduction is required in sectional properties to consider the possible lack of shear force transmission at the interlocks. Furthermore, the amount of steel per unit wall can be reduced, resulting in improved total cost. The hat type sheet pile 900 has also been used in the Philippines. ■

Website: www.giken.com



Top, above and left: Giken's F301 silent piler with hat type sheet pile 900 being used on a drainage project in Singapore. This versatile machine can be modified to suit various soil conditions and working environments.

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Volvo G-series wheel loaders with Z-bar linkage

The L60Gz, L90Gz and L120Gz wheel loaders from Volvo Construction Equipment (Volvo CE) are equipped with advanced technology designed to deliver excellent lifting and breakout forces in even the toughest of conditions. They are available in less regulated markets.

Each machine is built with an ideally matched all-Volvo powertrain, designed to work together in perfect harmony for optimised performance. Equipped with powerful Volvo engines, these machines offer high torque at low rpm to ensure low fuel consumption. Volvo's eco pedal also helps to guarantee fuel consumption is kept to a minimum, applying mechanical push-back force when engine rpm is about to exceed the economic operating range.

The L60Gz, L90Gz and L120Gz are built for an efficient, smooth performance. Fully Automatic Power Shift ensures optimal operation by adjusting machine gears in line with parameters including engine and travel speed, for comfortable gear changes and fast cycle times. Oil-cooled, wet disc brakes on the front and rear axles deliver superior breaking performance for smooth control and a long service life. The 100 percent differential locks on the front axle ensure outstanding traction in slippery conditions, and axle oil circulation allows the oil to flow and cool inside the axle – protecting components and increasing brake service life.

These L60Gz, L90Gz and L120Gz are built to last, and the durable Z-bar linkage provides high breakout forces for strong, powerful digging and complete bucket fill in even the hardest materials. This is combined with load-sensing hydraulics that supply power only when needed, lowering fuel consumption. Bucket pins are double sealed to keep grease inside the bearing and dirt out, ensuring long pin and bearing life, and the automatic bucket leveller and boom kick-out functions accurately stop the bucket and linkage in adjustable, pre-selected positions.

Alongside outstanding power and durability, the L60Gz, L90Gz and L120Gz offer superior operator comfort for an enjoyable and productive work shift. The spacious ROPS/FOPS Volvo cab includes ergonomically placed controls, a tiltable steering wheel and vibration damping, and the operator is granted easy access to the cab via a three-point access ladder with anti-slip steps and sturdy handrails. Slim cab pillars and large expanses of glass surrounding the cab create a productive and comfortable



Volvo L120Gz wheel loader in action.

operating environment.

Air is filtered through an easy-to-replace pre-filter to separate coarser dust and particles before passing through the main filter, allowing 90 percent of cab air to be recirculated for continuous dust removal.

To ensure the operator has all the necessary information and diagnostics for optimal performance, the Volvo Contronics system continuously monitors and records machine operation in real-time. Information including fuel levels and warning messages is relayed via the display in the cab.

The L60Gz, L90Gz and L120Gz are built to ensure quick and easy service and maintenance checks. Excellent access to the engine compartment and ground level access to the filters allow regular checks to be performed faster. Maintenance-free rear axle cradles reduce overall service cost and increase uptime. This innovative Volvo design minimises force on the axle, ensuring long component life.

For increased safety and reduced risk of machine damage, the Volvo brake wear indicator enables brake disk wear to be easily monitored, and service life of the main components is further enhanced by replaceable breather filters that ventilate the transmission, hydraulic tank, front and rear axles and fuel tank.

The exceptional design and superior durability of the L60Gz, L90Gz and L120Gz is enhanced by the excellent range of Volvo attachments engineered to work in perfect harmony with Volvo wheel loaders. These buckets have been developed as an integrated part of the machine, constructed from high quality materials including wear-resistant steel in the most exposed areas.

The L60Gz and L90Gz can be equipped with a general purpose, standard-duty bucket or a heavy-duty version optimised for loading shot rock, providing ultimate durability and wear resistance for unmatched lifespan and value for money. The L120Gz may be equipped with a standard- or heavy-duty bucket, as well as a re-handling bucket optimised for handling, stockpiling and loading processed material including aggregate and sand. The spade nose rock bucket has high penetration capabilities and is ideally suited for loading shot rock, and the light material bucket is a high capacity bucket for low density materials.

To support its durable, high performance buckets, Volvo offers a selection of cost-effective, replaceable wear parts. With a range including bolt-on edge, teeth, adapters and segments, customers can tailor their machines to meet specific job demands. ■

Website: www.volvoce.com



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Elematic has new technology levels for Acotec wall panels

Elematic has launched new technology levels for its Acotec wall production lines. These include Semi, Pro and Edge, which differ by the degree of automation and capacity as well as the required investment size. All lines are quick and simple to install, run and maintain and require only a limited land area.

Elematic Acotec production lines for light, non-load bearing, room-high precast partition wall panels cover the entire production process from concrete batching all the way to storage yard management and beyond. They are all automated and very reliable as they consist of proven, standard components.

The new technology levels are designed to meet various customer needs. The Semi line, with a production capacity of 80 sq m per hour, is the simplest of all. It features a smart combined restacker handler and automation only for the key processes. The Pro line has a higher capacity of 100 sq m per hour, with automated functions for all main processes: sawing, trimming, stacking, restacking, cleaning and oiling, plate handling and pallet circulation. The fully automatic Acotec Edge offers a top-rate capacity of 120 sq m per hour and needs only two operators to run.

All the lines - Semi, Pro and Edge - feature a new advanced production control system. Thanks to the system, a simple, modern user interface shows detailed data on every function in the whole

process. Various reports – on production rate, running hours and more – are generated automatically. Modular structure of the lines and their integrated electricity with Ethercat bus system guarantee short installation and start up time of all lines, and the line can also be installed in existing production facilities. The production process is environment-friendly as it is silent and non-vibrating, and the raw material can be recycled so no waste is created. Low energy consumption of the line keeps the production costs on a low level as well.

The Acotec wall panels are fast, easy and safe to install – building work proceeds up to six times faster when compared with traditional brickwork and even two times faster than blockwork. The panels have exact dimensions and completely even surface so no plastering is needed. In addition, their thin structure leaves more floor space for other purposes in a building. Despite the thinness, Acotec walls are strong and have been used in seismic areas. They are ideal for a wide variety of purposes such as bathrooms, kitchens and showers, thanks to the moisture resistance of the material. Acotec walls also offer excellent sound insulation, meaning that apartment buildings, schools and hotels benefit from this type of partition walls. ■

Website: www.elematic.com



Left and right: Elematic has introduced new technology levels for its Acotec wall production lines - including Semi, Pro and Edge - which differ by the degree of automation and capacity as well as the required investment size. The Acotec wall panels are fast, easy and safe to install.

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Liebherr's powerful tunnel excavator and crawler crane

The Liebherr R 950 Tunnel crawler excavator will replace its predecessor, the R 944 C Tunnel. It is designed for construction of tunnels and can adapt to a tunnel height of 5 to 8 m. The machine has an operating weight of approximately 45 t and the diesel engine delivers power up to 150 kW (190 kW optional).

The R 950 Tunnel is suitable for use in confined areas. The height adjustment facility automatically stops the movement of the excavator to avoid impact with the surroundings. The short radius of gyration as well as the rear and lateral cameras also minimise the risk of collision with walls, surrounding material and workers on site.

The productivity and flexibility of the R 950 Tunnel is enhanced by a wide range of tools in tunnel applications (bucket, hydraulic hammer, drill, drilling rail, etc). The breakout forces have been increased compared to the previous model. A specific hydraulic system for mounting cutting heads enables an increase in power, hydraulic oil flow and optimised cooling of the hydraulics. The tool change is carried out by the hydraulic quick coupler, whilst the flow rate, pressures and return of flow are adjusted from the cab. The cab is available in two versions: open (without windscreen or side windows) or enclosed.

In addition, the HS 8300 HD is the largest duty cycle crawler crane in Liebherr's HS series. Mounted on a pedestal, the crane has a weight of about 240 t. It is equipped with a main boom of 41 m and an underwater two-rope hydraulic clamshell with a capacity of 20 cu m. For optimum performance, the crane is fitted with two hydraulic freefall winches offering approximately 50 t of line pull each.

According to Liebherr, the HS 8300 HD is the company's first construction machinery to be equipped with the hydraulic hybrid drive Pactronic. This innovative hybrid drive based on hydraulics offers both economic and ecological advantages. Surplus energy is stored and subsequently regenerated, thus increasing the material handling capacity while at the same time significantly reducing fuel consumption. Both conventional V12 diesel engine offering 725 kW and the hybrid drive combined achieve a system power comparable to a conventional drive system with 1,250 kW.

The HS 8300 HD is designed to be durable. The steel fabrication of the basic machine is extremely solid and critical points were reinforced using extra high-quality materials such as carbon fibre. Furthermore, special production methods, including the use of automated welding robots, increase the machine's service life even under extreme operational conditions.

The HS 8300 HD is suitable for various dredging operations and other material handling jobs like dragline operation or equipped with an orange-peel grab. The Litronic control system, which is based on CANBUS technology and includes all control and monitoring functions of the machine belongs to the standard equipment of the HS 8300 HD.

The first model of the HS 8300 HD was recently sold to Italian company Zeta Srl, and will be installed on a ship for various dredging jobs in the Mediterranean Sea. The crane offers a maximum dredging depth of 25 m with hydraulic grab and up to 200 m depth with mechanical grab. The dredging depth can be automatically pre-set, thus regulating the maximum depth and ensuring flat dredging. ■

Website: www.liebherr.com



Above: The HS 8300 HD is the largest duty cycle crawler crane in Liebherr's HS series.

Left: The R 950 Tunnel crawler excavator, which will replace the R 944 C Tunnel.

Ammann AFT 350 and AFW 350 pavers

The Ammann AFT 350 and AFW 350 pavers have been widely used by paving contractors in the Southeast Asia region. Both machines, the wheeled AFW and the tracked AFT version, are offered with gas or with electric screed heating systems. The pavers also have wide paving capabilities given their compact nature, working at widths up to 4.5 m.

The AFW 350 is ideal for small- and medium-sized jobsites with restricted environments where manoeuvrability is required. The AFT 350 is a good fit for jobsites on difficult ground and it ensures thorough levelling.

The pavers are powered by a hydrostatic transmission that is engaged by two variable-flow pumps feeding two motors, with two displacements directly attached to the planetary gearboxes that operate the tracks. An electronic and proportional control mounted on each pump provides a progressive start/stop and maintains a constant set speed.

Material is fed by two independent reverse chain-belt conveyors and augers, which are controlled by toggle switches. The switches regulate flow to the screed and maintain the most effective distribution of material under any conditions. The auger height is adjusted by electrically controlled hydraulics.

A user-friendly dashboard brings new operators up to speed quickly. The toggle switches are easy to operate, even when wearing gloves, said Ammann. Screed operators also benefit from the easy-to-use toggle switches, which enable them to focus on the screed and not the controls.

The paver design, sliding seat and dashboard enable the operator to see all phases of the paving process, which improves productivity, quality and safety. The low discharge height of the hopper reduces material spillage that can cause mat defects. The wide hopper matches trucks of varied sizes, increasing fleet utilisation and making it easier to find outside haulers with appropriately sized vehicles. ■

Website: www.ammann-group.com



Above:
The AFT 350
tracked paver.

Left:
The AFW 350
wheeled paver.



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Linden Comansa cranes ‘towering above’ Bangkok

Two tower cranes from Linden Comansa are being used at the construction of MahaNakhon tower in Bangkok, Thailand. This 314-m-high skyscraper with 77 stories is set to be the tallest building in the country, featuring a hotel, shopping area and luxury apartments. The developer on the project is PACE Development Corporation Plc, and the contractor is Bouygues-Thai. The cranes were supplied by Smart (1994) Co Ltd, an official distributor of Linden Comansa in Thailand.

The LCL310 luffing-jib crane has been working at the base of the tower since 2012. It has a maximum capacity of 24 t and freestanding height of 40.4 m. The crane’s first job was to help build the MahaNakhon CUBE, a seven-storey luxury retail centre in the same area of the MahaNakhon tower which opened in 2014. Since then, the crane has been involved in unloading construction materials arriving at the jobsite, arranging and distributing them on the ground as well as lifting them up to the first floors of the tower. Thanks to its 60-m-long luffing jib, short counterjib and high load capacity, the LCL310 operates quickly and efficiently.

On top of the MahaNakhon tower stands a flat-top crane, the 21LC290, with a 40 m jib and maximum capacity of 18 t. Initially, the crane was erected on fixing angles with a freestanding height of 60.7 m. As the tower was gaining height, the 21LC290 was also getting higher thanks to Linden Comansa’s internal climbing system, which is tied to the structure of the building. This internal climbing system climbs the crane quickly and safely while maintaining two ties to the structure, and saves economic costs as it only needs 11 mast sections, when an external crane would need more than 60 mast sections to reach the height of 340 m, said Linden Comansa.

Smart trained the Bouygues-Thai’s erectors team on how to climb the 21LC290, by doing the first set of manoeuvres together. It took a total of 18 climbs to reach the maximum height of 340 m, climbing four stories each time.

For high efficiency, the 21LC290 is equipped with a 110 kW hoist motor, with speeds of up to 228 m/min. In addition, this engine has a high capacity cable drum (1,280 m of rope) manufactured by Lebus, so that the crane can permanently work with double trolley and full capacity of 18 t.



Early stage of the project with the 21LC290 (left) and LCL310. The MahaNakhon CUBE is the glass building on the right.



Above: The 21LC290 flat-top crane is equipped with a 110 kW hoist motor, which reaches speeds of up to 228 m/min.

Below: The LCL310 luffing-jib crane working on site.



All images © PACE Development Corporation Plc

The 21LC290 started with the construction of the core structure of the MahaNakhon tower in September 2013 and completed it 20 months later, in April 2015. Both the LCL310 and 21LC290 are currently working 16 hours a day, from 6 am to 10 pm under the Bangkok Metropolitan Administration guidelines, to meet the demanding schedule of the project. ■

Website: www.lindencomansa.com



Photography: Tim Hursley



Technal & Moshe Safdie

One of the most **spectacular hotel** in the world, the Marina Bay Sands in Singapore has been designed by the Boston-based, internationally renowned architect Moshe Safdie. Technal supplied **more than 2,000 four-sash sliding windows**, which enable to get outstanding results, especially in terms of **aesthetic and acoustic insulation** - achieving maximum comfort for users.

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Eurotec concrete batching plants provide 'RAPID' response

Eurotec's two MZ horizontal concrete batching plants are currently working on the Refinery and Petrochemicals Integrated Development (RAPID) project in Pengerang, Johor, Malaysia. Each plant has an output capacity of 200 cu m per hour, and is equipped with a chilled water system and flake ice machine.

The flake ice machine is particularly designed to further reduce the temperature of the concrete, resulting in a better quality product that meets the customer's expectation. The plants will remain on the project for five years, said Eurotec. ■

Website: www.eurotec.com.sg

Right: Eurotec plants being used on the RAPID project in Malaysia.



Doka's formwork solution for Abu Dhabi international airport

The Midfield Terminal Complex at Abu Dhabi International Airport is one of the emirate's most ambitious construction projects. Once completed, the expected number of passengers processed at the complex is between 27 and 40 million annually. The new terminal complex is erected between the airport's take-off and landing runways, and is scheduled to open in 2017. The Abu Dhabi Airport Company (ADAC) has selected the TAV-CC-Arabtec joint venture as the contractor for the project.

Construction is currently under way on a part of the complex - the Midfield Terminal Building. The airport terminal is 1.1 km long overall and covers 700,000 sq m. The structure's unusual X-shape is quite striking, which will be visible from a distance of 1.5 km.

The colossal piers are designed to accommodate up to 65 aircrafts

and able to handle planes as large as the A-380 Airbus megaliner. Doka's formwork solution has been chosen for the piers. It is tailored to the unusual shape and the tight 15-month schedule for cast-in-place concrete construction.

The Doka Staxo 40 load-bearing tower comes handy when forming the floors that require a total of 11,000 sq m Doka floor formwork. The lightweight shoring system stands out for its ease of handling, quick assembly and maximum adaptability. The solution for supporting walls and columns is provided by the Doka Top 50 large-area formwork. The pre-assembled formwork system meets all architectural requirements with respect to form, size and form-tie pattern. A total of 6,400 sq m Frami Xlife framed formwork is also in use. ■

Website: www.doka.com



Doka developed a customised formwork solution for the expansion of the international airport in Abu Dhabi.



Due to its lightweight, ergonomically designed components the Staxo 40 load bearing tower can be erected easily and does not require a crane.

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Kobelco cranes offer a new dimension in work efficiency.

Photo: 7250S in Singapore

Foundation works to make a bridge pier in pedestrian walkway.



CKE1350G in UK

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Crawler Crane Series

	<p>Multi-purpose lattice boom crawler cranes</p> <p>lifting capacity</p> <p>CKE-G series (European model) 60~250t</p> <p>CK-G series (American model) 85~275t</p> <p>CKS series (Standard model) 60~250t</p> <p>7000S series (Standard model) 120~250t</p>		<p>Large-sized crawler cranes</p> <p>lifting capacity</p> <p>SL-G series (European and American model) ... 300~550t</p> <p>SL-S series (Standard model) 300~550t</p>
	<p>Duty cycle lattice boom crawler cranes</p> <p>lifting capacity</p> <p>BME-G series (European model) 80t</p> <p>BMS series (Standard model) 80~100t</p> <p>BMS1200HD (Standard model) 120t</p>		<p>Telescopic boom crawler cranes</p> <p>lifting capacity</p> <p>TK series 55~75t</p>

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Rammer breakers hard at work in Malaysia and Japan

The excavation and site preparation for a residential housing development in Taman Connaught, Cheras, in Kuala Lumpur's southeastern suburbs, Malaysia, was recently undertaken by local civil engineering contractor, Crescendo Infra Sdn Bhd on behalf of a local developer. In order to undertake its primary rock breaking, Crescendo Infra opted for a Rammer 5011 breaker mounted on a 45 t class Volvo E460 excavator, supplied by Power Ram, Malaysia's Rammer breakers and attachments dealer.

The Rammer 5011 breaker has an operating weight of 4,750 kg and is designed for carriers in the 43-80 t class. Rammer's VIDAT (vibration dampening tie rods) system also provides improved reliability and minimises downtime, while the sealing system and enhanced lubrication help to reduce operating costs.

The 5011's ability to vary stroke length allows it to be purpose-matched to individual applications and materials through the use of two simple working mode selectors located on the breaker itself. The long-stroke setting of the 5011 uses a lower blow frequency for optimum breaking of hard materials, such as granite (and reinforced concrete foundations), while its short-stroke setting delivers higher blow frequency, making it ideal for softer materials, such as limestone.

At the same time, an idle blow protection system allowed Crescendo Infra's operator to easily adjust the working mode to provide protection against idle strokes. Further extending the working life of the 5011, it came fitted as standard with Rammer's Ramlube II system, which uses a cartridge mounted on the hammer to automatically deliver optimum levels of lubrication for greater wear protection and longer service life. The unit is installed to the hammer's housing with a mounting plate and no external electric cables or hydraulic hoses are needed.

The 5011 breaker as used by Crescendo Infra also comes with Rammer's Ramdata II service indicator as standard. This allows operators and service personnel to get information about the service interval status, service history and accumulated working history of their hammer.

In addition, Shoji Construction Industry, a Japanese company that specialises in tunnel construction, is using a Rammer 2577 on one of the country's most prestigious infrastructure projects. The 1,460 kg hammer, which is on hire from rental specialist Honda Kiko, is being used for secondary breaking and scaling on a major railway tunnelling project. The new line, of which the tunnel is an essential feature, is expected to reduce travel times from Hakata to Nagasaki from the current three hours and 40 minutes to just one hour and seven minutes.

The tunnel is being built for Shinkansen (Japanese bullet train) connecting Hakata and Nagasaki in the Kyushu Prefecture and is part of the 'Kyushu Shinkansen Nishi Kyushu Route Project'. Previously there had been only one Shinkansen line in the Kyushu Prefecture, which was located between Hakata and Kagoshima (crossing north to south). Upon completion, the new line – which is being constructed for the Japan Railway Construction, Transport and Technology Agency (JRRT) – will be directly connected to Osaka and Tokyo.

Mounted on a SH225XTN-3 Sumitomo excavator, and is equipped with a long moil point and hard rock chisel tool, the Rammer 2577 is being used primarily for scaling within the 978 m long tunnel. Here it has coped well with the andesite and turbidite rock that makes up the local geology. The company reports that the breaker is also used to perform primary breaking duties when required. ■

Website: www.construction.sandvik.com



Above: Crescendo Infra is using a Rammer 5011, mounted on a 45 t class Volvo E460 excavator, to break exceptionally hard granite on a residential project in Malaysia.



Left: Shoji Construction Industry is using a Rammer 2577 for secondary breaking and scaling on a major railway tunnelling project in Japan.

Paving with precision at Singapore National Stadium

Wirtgen's machines played an important role during the construction of Singapore Sports Hub, which was opened last year. The machines were used to help build the running track at the National Stadium.

Before laying the polyurethane running track, two layers of asphalt wearing course featuring a thickness of 50 mm had to be laid, with finished layer to meet a tight tolerance of ± 4 mm in the longitudinal grade of the 400 m long oval. An inward transverse cross-fall of 1 percent also had to be achieved at the same time during the paving process.

To conform to such stringent requirements, a Vögele Super 1600-2 asphalt paver was used in combination with an AB500-2TV hydraulic extending screed featuring integrated tamping and vibration functions. Paving widths ranged from 3 to 3.5 m to cover the complete width of the running track. Grade and slope control was a crucial aspect on the jobsite in order to stay within the specified tolerance range.

The contractor Double Trans Pte Ltd also used a Leica rotary laser together with two laser receivers installed on the paver for communication. The rotating beam emitted by the laser created a laser plane picked up by these receivers. When the laser receiver on the machine moved above or below the laser plane, signals for correction were emitted to the Vögele automated grade and slope control system, Niveltronic Plus.

For subsequent compaction of the asphalt wearing course, a Hamm HD75 tandem roller worked in strict compliance with the specifications. The base course laying was completed on schedule and a top coat of highly elastic polyurethane was applied at a much later stage when all working equipment had been cleared from the jobsite. ■

Website: www.wirtgen.com.sg

Both images: Singapore National Stadium's running track was built with the help of Wirtgen's machines.



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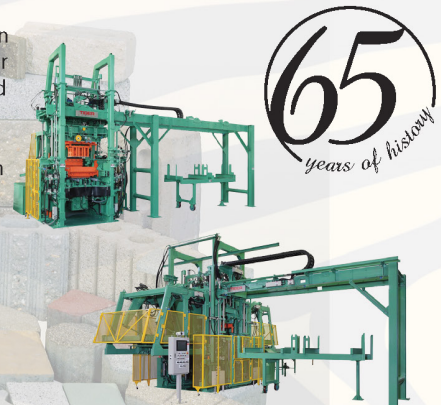
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Volvo machines ‘driving change’ in Indonesia and Cambodia

At the foot of Tangkuban Perahu in Indonesia – a dormant volcano that last erupted in 1983 – is West Java’s capital city, Bandung. Located just outside the city is aggregates producer Alam Jaya CV, a company that excavates Andesite volcanic rock and crushes it into various sizes of aggregate for use in general construction and road-building throughout West Java. The company uses three Volvo Construction Equipment (Volvo CE) excavators, including two EC210B-Primes and one EC220DL to load the rock onto trucks.

ITU is Volvo’s dealer for the island of Java. The company has a local sales, spare parts and service branch in the province for fast, responsive aftermarket support.

The EC210B-Prime features a Volvo D6E engine with a power output of 106 kW at 1,800 rpm. Its high-capacity electrical system is protected by waterproof double-lock harness plugs to prevent damage or corrosion – even in the wettest conditions. The machine has a robust X-shaped undercarriage and wide tracks for maximum stability on uneven ground.

The EC220DL is an evolution of the EC210B-Prime, packed with innovations to improve productivity and efficiency. It features the improved Volvo D6E Tier 2 engine that delivers excellent torque at lower revs. Its improved hydraulics also contribute towards improved fuel efficiency – along with Volvo’s ECO mode – as well as shorter cycle times for increased performance. The cab has been improved to feature a more ergonomic control layout and increased comfort for operators.



Above and below: Indonesian aggregates producer Alam Jaya uses three Volvo excavators at its volcanic rock quarry in Bandung, including two EC210B-Primes and one EC220DL.



The EC220DL at Alam Jaya’s site has clocked over 3,260 hours so far. The company said that it intends to purchase another two EC220DLs within the next year if demand for aggregates continues to rise in the local area.

In addition, Vattanac Properties has recently started construction of a new designer golf course in the Cambodian capital, Phnom Penh, located just 15 km from the city centre. This new golf resort will cover over 500 ha, featuring 18 challenging holes. Five Volvo EC210BLC crawler excavators have been chosen since the early stages of development to work in a range of applications onsite. The machines will be instrumental in constructing all aspects of the luxury golf resort, which will include a club house, hotel, wedding banquet facility and extensive real estate. The development is set to be completed in 2020, with the five EC210BLC machines contracted until the project close.

Volvo CE’s dealer in Cambodia, United Mercury Group (UMG), recommended these machines as a perfect fit for the variety of tasks the projects entails. Currently, the machines are involved in clearing the land for the first stages of development. UMG is providing a full range of aftersales services, ensuring that each machine is performing to the highest standards at all times.

The EC210BLC is a popular machine throughout the region, said Volvo CE. It features a unique hydraulic system and four power modes for ultimate versatility. In addition, a robust undercarriage and variety of boom and arm configurations make this machine an ideal fit for the range of tasks required on this project. ■

Website: www.volvoce.com



Above and below: Construction of a new designer golf course in Phnom Penh, Cambodia, is being carried out with the help of Volvo EC210BLC crawler excavators.



Potain cranes build China's new financial complex

Eight Potain tower cranes have been installed on the development of Haixi Jinggu Square, which is set to be the largest financial complex in Xiamen, Fujian Province, China. The 430,000 sq m site will include a hotel, office space and a commercial centre, valued at a total investment cost of approximately RMB3 billion.

The cranes for this high-profile project were supplied by three local rental companies to serve the needs of main contractor China Construction. Xiamen Jiang Han Machinery Company provided four new MCT 205 topless tower cranes, which arrived directly at the job site from Manitowoc's factory in Zhangjiagang. Xiamen Xiaoxin Crane Rental Company supplied three Potain MC 125 units, while Xiamen Yuda has a Potain MC 310 K12 tower crane on the project.

Installation of all eight cranes was completed in April 2015, including setting all foundations for the bases. Despite the large job site, much of the building work requires the cranes to overlap, so having four topless cranes meant that overall working heights could be lower. In addition, Potain's quick connection pins plus the modular design of the cranes means assembly times can be dramatically reduced, maximising productivity for contractors. The cranes will remain on the project for 24 months and will be lifting building materials up to heights of 180 m.

The 10 t capacity MCT 205 was introduced to the Potain product line at the end of 2014. The crane offers a maximum radius of 65 m and a tip capacity of 1.75 t. It is quick and easy to erect with the heaviest group of components weighing just 7.9 t and the full jib can be placed in a single lift. Its topless design makes it ideal for busy construction sites, such as Haixi Jinggu Square, because taller cranes can overlap lower ones with less height difference than would be required with traditional tower cranes. Of the four MCT 205 cranes on site, two are configured to reach a maximum height of 180 m, one will reach 100 m and the other will reach 70 m.

The 6 t capacity MC 125 features a maximum jib length of 60 m and a maximum tip capacity of 1.15 t. For the MC 310 K12, maximum capacity is 12 t while the maximum radius is 70 m and tip capacity is 3.2 t. Like the MCT 205, the MC 125 and MC 310 K12 are manufactured at the Zhangjiagang factory.

The Haixi Jinggu Square financial complex is made up of four towers, reaching up to 46 stories. There will be two financial trading halls covering an area of 1,000 sq m, hosting wealth management and financial companies. ■

Website: www.manitowoccranes.com



Above and bottom: Potain tower cranes work on the Haixi Jinggu Square development, which is set to be the largest financial complex in Xiamen, Fujian Province, China. The cranes are used to lift building materials up to heights of 180 m.



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Gomaco 4400 teams up with RTP-500 in Arkansas project

Gerdan Slipforming has used its Gomaco 4400 barrier paver on the I-49 project near Springdale, Arkansas, USA. The company had to slipform five different profiles of concrete barrier wall along the 4.2 km stretch of reconstructed interstate. The project also required Gerdan to slipform its first variable barrier.

The entire I-49 widening project had to be completed in 99 working days. Challenges included dealing with the continuous steel cage reinforcing, perfecting a concrete mix design and slump for tall wall, a jobsite with limited access within a heavily-travelled interstate, and learning how to slipform variable barrier.

The design of the steel cage only called for a #4 rebar, which wanted to rack. The cage wanted to push forward with the direction of machine travel, because of the weight and the pressure of the amount of concrete required for the tall wall. Gerdan needed to add #6 bar within the existing cage to strengthen and reinforce it. During the first two weeks of paving, the mix of the concrete was fine-tuned. Gerdan found the best concrete for the variable barrier was a modified Class SAE mix similar to what they use when slipping bridge parapet. The company added more cement to the mix design and specified a concrete slump of 19 mm.

Early on with the project, the ready-mix supplier decided it would set up a central mix batch plant. When that was decided, Gerdan met with Gomaco and Fabick CAT, the local Gomaco distributor, and the unanimous decision was made to use dump trucks and a concrete placer to feed the 4400. Gerdan chose to buy a new RTP-500 rubber-tracked placer after researching the used market and the rental possibilities. The first stage of the project involved slipforming a concrete footing with a rebar stem wall. With the footing in place, the variable barrier production could begin.

Concrete was delivered to the site with dump trucks carrying 6.9 cu m loads. The project only had four access points into the construction area, two at the far ends of the project and two in the centre. Sometimes, trucks would have a long distance to back down to the RTP-500. Once there, they dumped their load into the RTP's large receiving hopper.

The RTP-500 provided a continuous flow of concrete into the 4400's auger hopper. The auger's four-way hydraulic positioning, and an added 610 mm long auger extension, allowed it be placed for optimum concrete receiving and delivery into the large double-variable barrier mould.



A 2,268 kg counterweight package was positioned on the right side of the paver.



Gerdan Slipforming achieved high-production variable barrier with its Gomaco RTP-500 rubber-tracked placer and 4400 barrier paver. Production averaged 183 m per night slipforming 1,930 to 1,981 mm high wall over steel-cage reinforcing.



The mould required 1.5 cu m of concrete to fill, had 914 mm of variable height adjustment on each side and could reach a wall height as tall as 2 m.

Gerdan ran the stringline underneath its 4400, between the four tracks. The company equipped its barrier paver with a 2,268 kg counterweight to offset the size of the double variable barrier mould. It also positioned two smaller counterweights over the right-side tracks. Behind the 4400, a broom finish was applied to the new wall followed by a white spray cure. Control joints were placed at 9.1 m spacings and expansion joints were saw cut every 36.6 m after the concrete cures.

Together, the 4400 with the RTP-500 out in front created some impressive production figures along Arkansas' I-49. Slipping 1,930 to 1,981 mm high wall, production averaged 183 m per night. It was the 1.4 to 1.5 m high wall, though, where Gerdan really hit its production stride. On its best night, the company slipformed 399 m, and in two consecutive night pours, it produced a total 773 m of the variable wall. ■

Website: www.gomaco.com

Peri systems form DUO mixed development

DUO is a twin-tower integrated mixed-use development in Singapore comprising residences, offices, a hotel and a retail gallery. Designed by architect Ole Scheeren and scheduled for completion in 2017, the development will be directly connected to the Bugis MRT station providing easy access to the central business district, Marina Bay and major shopping, dining and entertainment areas at Orchard Road and the Singapore River.

The liftcore and staircase walls for both the office hotel and residential towers are being formed by Peri's Vario GT 24 wall formwork, RCS rail climbing system and ACS self climbing system. The ACS system uses a specialised hydraulic-enabled machinery to climb and thus do not require the use of cranes. For greater efficiency, the concrete placing boom has been incorporated into the core wall systems. As such, there is no need for additional openings in the slab.

The ST 100 stacking tower is used for the slab and beam at high void area casting of the construction. All the ST 100 stacking tower system components are assembled without any bolts or pins. With only one frame size, every working height is simple to plan and organise. It guarantees a fast assembly and dismantling due to the low weight of the individual parts (the base frame is 17 kg and the stacking frame is 7 kg).

For perimeter safety, the RCS P climbing protection screen is also being installed to allow safe working at the slab edge at height. Site personnel are secure at all times and protected against strong winds when working at great heights.

Other Peri systems in use include Gridflex grid element slab formwork, Peri Up Rosett, PD8 slab table and Multiprob slab props. ■

Website: www.peri.com



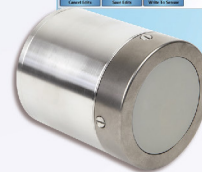
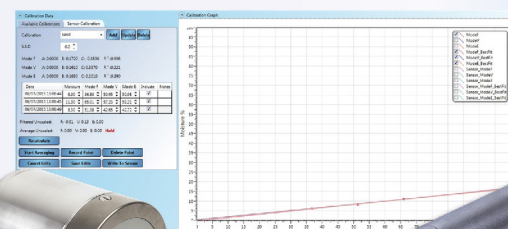
Above: The ST 100 shoring towers can be used to cast the slabs at the heights of up to 22.3 m.

Below: The RCS rail climbing system provides protection at great heights. Even in windy conditions safety at work is ensured.

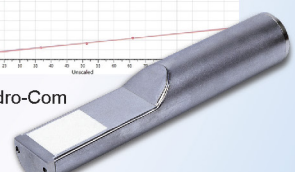
Bottom: The application of Vario GT 24 wall formwork system allows flexible shuttering.



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Terex Superlift 3800 installs footbridge in France

The Versailles Chantiers train station in France serves nearly 70,000 passengers each day. To accommodate the growing number of passengers, the National Society of French Railways (SNCF) – France's national state-owned railway company – added a pedestrian bridge over the railroad tracks for easier access to the station from the parking lot. To carry out this job, Dufour Transport Handling, the lifting contractor on the project, selected a Terex Superlift 3800 lattice boom crawler crane.

Installing the metal footbridge over the tracks within a tight deadline meant that the Versailles train station had to be temporarily closed. According to Dufour, for one weekend, the station was completely closed and, during lifting operations, train traffic was also fully stopped from Paris to the south of France. During that weekend, 350 buses had to be arranged to accommodate commuters typically riding the trains originating from the Versailles Chantiers station.

The Superlift 3800 offers fast and efficient mobilisation with innovative features such as nesting boom segments and no component being wider than 3 m for transport. Its quick-connection system allows the superstructure to be installed or removed in less than 15 minutes, improving assembly speed. The Terex fall protection system

provides safety during boom assembly.

With the aid of a 250 t capacity class Terex AC 250 all terrain crane, six Dufour crew members, including two crane operators, began assembling the crane and Superlift structure once the components arrived at the train station. Three days later, the Superlift 3800 was ready to assist with bridge construction.

The crane's tray and crawler carrier were loaded with 225 t and 50 t of counterweight respectively to handle bridge segment weight when working at radii in excess of 70 m. To lift the metal structures in place, the crane required 90 m of main boom. Working in an extremely confined area, crews attached the first metal bridge segment weighing 80 t to the crane's cables. At a radius of 76 m, the Superlift 3800 hoisted the segment into place for installation. The crane then hoisted the heavier, 111 t metal segment into position, working at a 51 m radius.

Within the short weekend timeframe allotted to Dufour for footbridge installation, crew members were able to complete both bridge picks, so the Versailles Chantiers train station could reopen on schedule. The station is now back to operating at normal capacity. ■

Website: www.terex.com/cranes



Left and right: Terex's Superlift 3800 lattice boom crawler crane helps install a footbridge over the Versailles Chantiers train station. The crane offers fast and efficient mobilisation with innovative features such as nesting boom segments and no component being wider than 3 m for transport.

Dynaset hydraulic generator provides electricity for Finland jobsites

Finnish company Napapiirin Energia ja Vesi Oy, based in Rovaniemi, is responsible for electricity, heat and water supply in the area. Its tasks also include building new networks, maintenance and repair. To increase efficiency and speed up operations, the company requires pipeline subcontractors to equip their excavators with generators. MSL Kemppe Oy, a subcontractor for the city of Rovaniemi, uses a Dynaset HG hydraulic generator on each of its excavators.

The HG hydraulic generator is one of Dynaset's hydraulic equipment on excavators. In addition to 16 standard models (3.5-70 kVA), Dynaset manufactures special hydraulic generators with power ranging from 70 to 350 kVA. There are also enclosure protection IP54 models available. Customers may choose between two frequency levels, 50 Hz or 60 Hz. The HG hydraulic generator can be used for multiple purposes at the jobsite, such as generating power for electric tools, lights, welding, pumps, angle grinders, concrete mixers etc.

Smooth running and automatic frequency control of the hydraulic generator produces steady and high quality electricity. Its size and weight are only half of the combustion engine generators and since there is no a large fuel tank or a heat-generating exhaust pipe, hydraulic generator is also easy to install in a confined space, explained Dynaset.

In addition, Dynaset's HWG hydraulic welding generator is suitable when powerful welder is needed at the jobsite. It replaces



Dynaset's HG hydraulic generator mounted on a JCB excavator.

the traditional welder in mobile use and generates electricity for tools, said Dynaset. The HWG is easy to connect on the hydraulics of mobile machine with quick couplings. Dynaset K-series models also provide three-phase electricity. ■

Website: www.dynaset.com

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Skyjack scissor lifts work around the clock at Brazil airport

Skyjack currently has more than 60 electric scissor lifts, owned by Motormac Rentals, working at one of Brazil's largest aviation hubs - Viracopos International Airport in Campinas, São Paulo state's third largest city. The machines are helping to expand and upgrade the airport terminals to keep up with a growing number of passengers.

In 2013, Viracopos International Airport received 9.3 million passengers and 260,000 t of cargo. By 2042, the site is projected to receive 80 million passengers annually and transport many times more cargo than it does today, becoming one of the busiest airport hubs in Latin America.

The first phase of the ambitious US\$3.5 billion expansion project involves a mix of 63 SJIII 4626 and SJIII 4632 electric scissor lifts helping to construct a new 1.2 mil sq ft terminal. These scissor lifts are being used to install electrical components, hydraulic pipes, air conditioning parts and safety equipment - including fire extinguishers and speakers for radio and audio announcements at the airport. Towards the end of the project, the scissor lifts will also help with waterproofing and painting jobs.

Skyjack's scissor lifts are also helping to make Viracopos International Airport one of the most technologically advanced airports in Brazil. Operators have been using the electric scissor lifts to install state-of-the-art data transmission cables and internet connection devices, a task that often requires lifts that can manoeuvre in tight spaces.

The SJIII 4626 and SJIII 4632 electric scissor lifts combine a series of features that set them apart from competition and come in handy at the airport project. With an emphasis on smart design, Skyjack machines are easy to service, require little maintenance and have high capacity and large platform areas. Motormac leased the Skyjack lifts to Constran, the main contractor of Aeroportos Brasil Viracopos - a consortium that won the bid for the airport's 30-year expansion project.

Both models are drivable at full height and feature a 1.22 m roll out extension deck that can be secured in multiple positions. The SJIII 4626 has a raised platform height of 7.92 m, a working height of 9.75 m, 30 percent gradeability and a weight capacity of 454 kg. The SJIII 4632 has a raised platform height of 9.75 m, a working height of 11.58 m, 25 percent gradeability and a weight capacity of 318 kg.

Motormac's Skyjack scissors have been working around the clock to deliver the airport project on schedule. In fact, Motormac has a scissor lift specialist on-site to guarantee safety and soundness of the equipment, and to ensure the contractor is using all machines to their full potential. In addition, Skyjack has worked with local governments and regulatory agencies to ensure aerial work platform operators on the Viracopos project and in the country in general are properly trained to do so safely and effectively.

Motormac Rental specialises in equipment rental for a diverse range of industries. It offers generators, aerial lift platforms, light towers and telehandlers. The company is part of Motormac Group, which has 40 years of history in energy and productivity solutions. ■

Website: www.skyjack.com



Both images: Skyjack electric scissor lifts help to expand and upgrade the Viracopos International Airport in Brazil to keep up with a growing number of passengers.

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QIANXIMEN BRIDGE



Two new iconic bridges in the city of Chongqing, China, have been completed - the Qianximen Jialing River Bridge (Qianximen Bridge) and Dongshuimen Yangtze River Bridge (Dongshuimen Bridge), known collectively as the Twin River Bridges.

The Qianximen Bridge over the Jialing River connects the Yuzhong Peninsula with the northern district of Chongqing. Opened in 2014, this 720-m-long double deck structure carries four lanes of traffic on the upper deck and two rail transit tracks on the lower deck. Supporting the needs of the rapidly growing city, the main function of the bridge is to facilitate the flow of both light rail and road traffic between the southern and northern districts of the city across the central business district without disruption.

The Twin River Bridges were built based on the winning design from the international

Top and above: The new Twin River Bridges in Chongqing, China, will enhance the city's skyline while serving as a dual function bridge providing for light rail and vehicular traffic.



design competition organised by Chongqing City Investment and Construction Company in 2008. The aim was to select a concept design for two new signature bridges that would enhance the city's skyline while serving as a dual function bridge providing for light rail and vehicular traffic.

Design criteria

Located close to two of Chongqing's key historic landmarks (Huguang Guild Hall and Hongyadong), aesthetics was an important consideration during the bridge type selection process. The two bridges also had to be cost-effective and meet strict design life criteria. In particular, the design life of the Qianximen Bridge is 100 years for the main structures, such as foundations, towers and girders. Replaceable elements, such as the stay cables, have a 50-year service life.

Other design considerations were: a preference that the bridge type for both structures be identical due to their close proximity; a bridge girder that was at least 12 m deep to accommodate rail transit tracks, which called for a truss to increase the overall transparency of the structure; navigational requirements and local geology also demanded a 127-m minimum net width and a 10-m vertical clearance for a one-way ship channel at the side span; bridge maintenance should be catered for without negatively impacting the light rail

service; and large expansion gaps were placed at both ends of the bridge, with a special device at the expansion joints for supporting the heavy rails.

Partially cable-stayed girder bridge

T.Y. Lin International and China Merchants Chongqing Communications Technology Research & Design Institute Co Ltd as the chosen bridge designers presented two design schemes: a pair of suspension bridges and a pair of partially cable-stayed girder bridges.

Conventional suspension bridges were deemed unsuitable due to the highly fractured rock conditions on the Yuzhong Peninsula, which challenged the efficiency, cost effectiveness and aesthetics related to anchoring the main cables. A self-anchored suspension bridge scheme was also rejected due to the high cost of erecting the girder before the cables could be suspended, as well as the risks associated with potential ship collisions with the temporary supports during high tide.

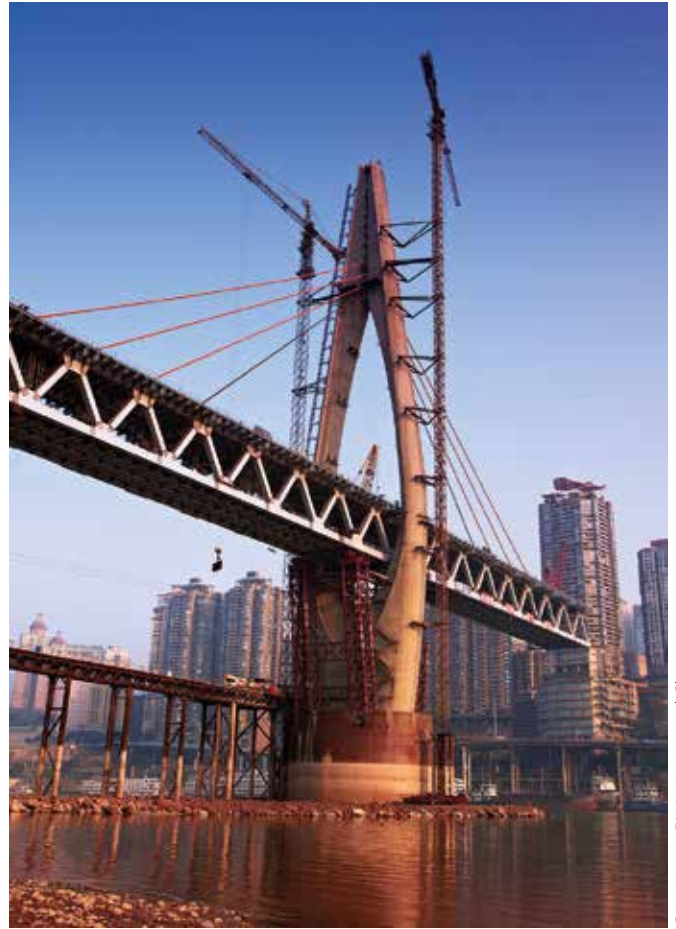
Ultimately, the partially cable-stayed girder bridge design devised by T.Y. Lin was chosen. This concept had been applied successfully to the firm's design of other medium-span bridges in China, most notably the 110-m main span Sanhao Bridge in

Shenyang. While the minimum main span length of the Qianximen Bridge is much longer at 312 m, the 12-m girder depth is also much deeper. Thus, the span to girder depth ratio is comparable to the Sanhao Bridge. The span to girder depth ratio for Qianximen Bridge is $340/12 = 28.3$. This ratio was within the economic range of partially cable-stayed girder bridges.

The Qianximen Bridge is 720 m long, of which 52 m is cable-stayed main span. It features a single, elegant concrete tower that rises 100 m above the upper bridge deck, with nine pairs of cables. All of the cables are on a single plane on the centre line of the bridge, giving the structure a transparent appearance. The upper deck is an orthotropic steel deck with a minimum deck plate thickness of 16 mm. The main floor beams are 2 m deep. The lower deck consists of four longitudinal beams located directly under the rails. Transverse girders are 1.20 m deep. The lower floor system is also an orthotropic deck with open ribs that serves as a platform next to the tracks and acts monolithically with the lower chord of the main truss.

As a signature element of the Jialing River crossing, the single tower of the Qianximen Bridge could have incorporated either a diamond shape or an inverted-Y shape. However, both tower shapes were deemed to be insufficiently distinctive. After extensive studies, the design team devised a unique, curvilinear shape that resembles the shuttle of an ancient Chinese weaving machine, blending Chongqing's rich historic legacy with modern-day bridge aesthetics.

Right and below: The Qianximen Bridge is 720 m long, featuring a single, elegant concrete tower that rises 100 m above the upper bridge deck.



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Continued on page 62...



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POTAIN
by **Manitowoc**

Continued from page 60...



The Qianximen Bridge was opened in 2014, connecting the Yuzhong Peninsula with the northern district of Chongqing. This double deck structure over the Jialing River carries four lanes of traffic on the upper deck and two rail transit tracks on the lower deck.

Reduced noise pollution

The concept of a partially cable-stayed girder bridge was applied on this project with great advantage. The intention was to design a girder bridge where the load capacity would be supplemented by the cables. The cable forces were selected to bring the total capacity of the bridge to the required level, enabling cable forces to be assigned with relative freedom. Since portions of the girder had insufficient capacity to resist the bending moment caused by the load on the girder, the cable-stay system produced a bending moment capacity to make up for the difference that was employed.

Subsequently, to simplify the construction of the girder, a set of cable forces with the same vertical component was selected. This allowed one design for all cable anchorage points, with the bridge design assigning the same force to all cables resulting in a simplified cable manufacturing process.

In China, it is common practice that railway design codes be considered the primary code when designing a dual-function (rail and road) bridge. However, in developing the design the existing codes were considered insufficient for the long span, dual functional bridge, leading to the development of a new specification that included functional requirements; live load and load combinations;

dynamic stability requirements; and rigidity requirements and other special details.

Passenger stations for the light rail transit system were placed at both ends of the bridge. With trains accelerating when entering the bridge and decelerating when exiting, minimising potential noise pollution was a priority as the Qianximen Bridge is in close proximity to residential buildings. The installation of noise-absorbing and insulating walls along the bridge minimised the potential noise impact associated with the development for the local community.

Due to the exceptionally heavy passenger traffic using the bridge, most bridge maintenance is required to be performed without closing the light rail service. In response to this requirement, the T.Y. Lin design provides foreasily-accessible maintenance walkways and suspended maintenance wagons inside the bridge girder.

To minimise the potential for pollution of the Jialing River and its surroundings the Qianximen Bridge utilises a slagless track bed (integral track bed). In addition, a double-wall steel cofferdam was adopted when constructing the piers to minimise the potential impact on the watercourse and surroundings. ■



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HANOI INTERNATIONAL AIRPORT TERMINAL 2

The new Terminal 2 at Noi Bai International Airport in Hanoi, Vietnam, went into full operation at the end of December 2014. It serves all international flights to and from Hanoi, boosting the airport's capacity by 10 million passengers a year.

One of the companies charged with moving the project from the design stage to the construction site was global engineering consultancy Aurecon, which provided structural and geotechnical engineering on the project. In addition to consulting on the terminal building, Aurecon also advised on the apron works, roads, ramps and a number of other smaller ancillary buildings.

Large scale

One of the biggest challenges in the design was the scale of the terminal. Measuring 1 km from end to end, the facility comprises a four-storey building with two concourses, each around 400 m in length. Total gross floor area of the development is 138,000 sq m, while the steel roof covers an impressive 60,000 sq m.

To deliver the open plan environment that characterises so many of today's airport terminals, meant using some very large-scale components in the design. For example, the longest continuous

trusses measure 175 m end-to-end, while the maximum clear span of the trusses between columns is 48 m. The spacing between the two central primary trusses is 36 m, which is 50 percent greater than the 24 m spacing that would be more typical in a design such as this.

Tuyen Bui, country manager for Aurecon in Vietnam, said dealing with larger scale airport terminal developments is a growing trend. "Airport terminals are continuing to grow in size and importance for countries. They are the first and last impressions that visitors get of a country. So developers are looking for striking and modern designs while in more practical terms, they want to plan for ever increasing traffic. From an engineering standpoint, that means coming up with a structural design that will stand the test of time without compromising integrity," he explained.

For Noi Bai International Airport's Terminal 2, Aurecon was on the ground from the design phase through construction, with key members of its design staff based in Ho Chi Minh and further support - for the steelwork roof structure, elevated road structure and other geotechnical aspects - provided by Aurecon's offices in Thailand and New Zealand.

Hanoi's International Airport
Terminal 2 under construction.



Protecting against damage from earthquakes was one of the central requirements for the design, so Aurecon was responsible for factoring in additional strength for the development, in line with Vietnamese building standard TCVN 375:2006. The client on the project, Airports Corporation of Vietnam, also demanded strict adherence to numerous other building standards including the American Concrete Institute's ACI standards and Standards Australia's AS standards.

"There are always special factors to consider in airport terminal designs, such as the higher factors of safety needed for crowded areas," said Tuyen Bui. "But on this project we had to make sure that our design not only satisfied normal requirements, but also the additional design factors to protect against seismic activity."

Aurecon's office in Vietnam began operations in 2003. The company has worked on a range of high profile projects in Vietnam, such as the Indochina Plaza in Hanoi, the Thu Thiem tunnel and the Ban Phuc nickel mine. The company also provided full engineering services to the BlueScope Steel manufacturing facility. ■

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BUKIT BINTANG STATION

The Klang Valley Mass Rapid Transit (KVMRT) is a rail-based network, which, together with other existing services, will form the backbone of the Kuala Lumpur/Klang Valley public transport system centred in Kuala Lumpur, the capital of Malaysia. The first KVMRT line to be built is the 51 km Sungai Buloh-Kajang line and construction officially began in July 2011. The line is expected to be fully operational by July 2017.

The Sungai Buloh-Kajang line starts from Sungai Buloh, in the northwest of Kuala Lumpur, runs through the city centre of Kuala Lumpur and ends in Kajang, a fast developing town in the southeast. The line serves a corridor with an estimated population of 1.2 million. It will be underground for a distance of 9.5 km and will have 31 stations, seven of which will be underground.

The Bukit Bintang station is located in the 'Golden Triangle' commercial hub of Kuala Lumpur, a popular spot for tourists due to its many shopping, dining and entertainment outlets. The station consists of four levels namely concourse, upper platform, plant-room platform and lower platform.

The Bukit Bintang station is constructed using the top-down method with a total excavation depth of 33 m. It has a footprint of 150 m by 19 m with depths of 16.9 m from existing ground level to the top of rail level for the upper platform and 30.4 m to the top of rail level for the lower platform.

Waterproofing solution

MMC Gamuda KVMRT (T) Sdn Bhd, the



Above: Applying Biblock, a water-based epoxy curing membrane (inset), by roller.

Top: The Bukit Bintang 'Golden Triangle' area in Kuala Lumpur.
Above: Ground excavated and compacted.

Below: Pressure grouting of vertical joints in diaphragm walls with Mapefill SP.



project delivery partner, wanted a durable, high-performance waterproofing system for the roof slab to provide long-term, low-maintenance protection against water ingress. For this, Mapei was able to supply the ideal solution.

After the ground was excavated and compacted, diaphragm's vertical joints were grouted with Mapefill SP cementitious grout. The joints of a 1.5 cm thick concrete slab were treated with Idrostop SW 475 and Idrostop Tuboflex.

After the top decks were casted and immersed in water for a seven-day curing period, the concrete surfaces were cleaned by high-pressure hydro-washing to remove laitance and contaminants. Excess water was removed before applying Biblock epoxy curing agent by roller and left to cure for a further three days.

Primer SN, a two-component epoxy primer was then applied by roller and, after the surface moisture was checked, Purtop 1000 was applied by spray application to form the durable high-performance waterproofing coating. ■

Website: www.mapei.com.my



The article courtesy of Realta Mapei International no. 51



Above: Applying Purtop 1000 by spray machine.

Left: Laying a 75 mm cement-sand protection screed on top of the polystyrene boards.

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Work on the Pioneer Park is currently underway.

PIONEER PARK

Pioneer Park is a huge 30-ha multi-use complex under construction in Gurgaon, India. The development will include a hotel, commercial complex and residences, and is located less than 8 km from central Gurgaon and 25 km from New Delhi. Work started in 2009 but in late 2011, after a series of delays, developer Pioneer Urban Land and Infrastructure Ltd called in contractor Urban Ecoinfra Pvt Ltd to take over building work from the previous incumbent.

Charged with pulling the project back on schedule, Urban Ecoinfra made a number of changes, including bringing in a new management team, creating a new construction schedule and installing new tower cranes.

“When we first took over, we quickly determined what we could change and there was a strong consensus that we could get greater productivity and longer periods of uninterrupted work time with better tower cranes,” said Rakesh Bohra, SVP at Urban Ecoinfra. “Given the time pressures on this job we can’t afford any delays or to take any risks, so we chose Potain tower cranes. We replaced the previous cranes with six new Potain cranes so we could meet the efficiency levels needed to complete this project on time.”

Efficient lifting

Five MCi 85 cranes and an MC 205 crane were chosen for the project and installed on the site of two luxury residential complexes, named Araya and Presidia, plus an associated retail and commercial building. The cranes were chosen for their speed and strength, features that allowed them to increase productivity.

The Presidia residential development consists of five luxury apartment blocks with a modern design that includes ‘sky garden’ walkways around the innovative open-plan apartments. Two MCi 85 cranes were installed on this part of the project and both helped ensure that building work wrapped up at the end of 2014 when it reached its final 120 m height.

On the Araya residential blocks Urban EcoInfra relies on an MC 205 tower crane with two MCi 85 cranes, including one that was dismantled from the Presidia project and moved earlier this year.

Continued on page 70...

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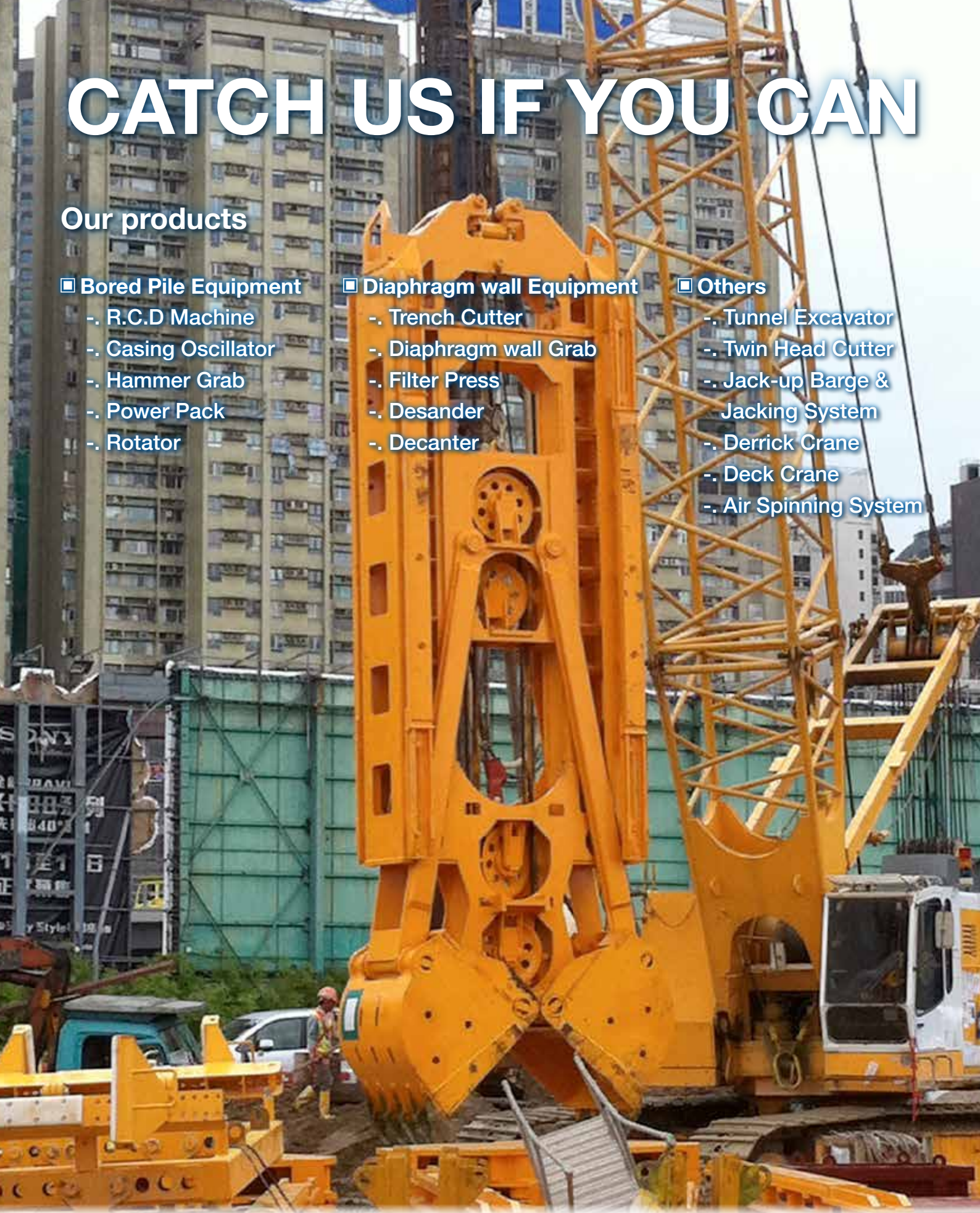
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Continued from page 68...

The Araya apartments incorporate contemporary styling and double height ceilings, and the tower will eventually stand 150 m tall. The cranes will be in place until the end of 2015. Three MCi 85 cranes are also working on the retail and commercial building, which is scheduled for completion in September this year.

To ensure the highest levels of operating efficiency, Manitowoc Crane Care provided on-site training for all crane operators, while Amit Mahajan, deputy general manager of plant and machinery at Urban Ecoinfra, said that weekly and monthly maintenance programmes ensure the cranes keep working. "So far we've had no stoppages on the project caused by problems with the tower cranes," he said. "We're extremely satisfied with their performance and reliability. Many of our projects are transitioning from more traditional construction methods to modular processes, so having proven and reliable equipment is crucial to our success."

The 5 t capacity MCi 85 is the most popular Potain tower crane in India, said Manitowoc. Built at the company's facility in Pune, it is designed for easy assembly and its strong load chart makes it a very versatile crane. When working with a 25 m jib the crane can lift 3 t at jib end and with its full 50 m jib it can lift 1.3 t at the jib end.

The 10 t capacity MC 205 tower crane is designed to be easier to erect and dismantle. Two 5 m jib sections can be quickly combined into a single 10 m jib section for faster assembly. The jib length configurations can vary from 30 to 60 m in 5 m increments. The jib end capacity at 60 m is 2.4 t. ■

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Top and above: Potain MCi 85 and MC 205 cranes were chosen for the project and installed on the site of two luxury residential complexes.



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GOLDEN QUADRILATERAL



Top: The Wirtgen WR 2400 pushes a bitumen and water tanker ahead of it. Right behind it, a Hamm compactor 3520 compacts the prepared base course.

Above: The second of four lanes is processed by the WR 2400 in a width of 2.30 m with a 10 cm overlap to the recycled first lane.

India's Ministry of Transport has been expanding the national motorway network for many years. One of them is the Golden Quadrilateral, which spans 5,846 km connecting New Delhi, Chennai, Mumbai and Calcutta. The four-lane sections have been rehabilitated and extended to six lanes. This work was carried out as part of a PPP project on the southeastern section, the NH-5 near Chennai.

The contract for expanding the 43-km-long section between Chennai, in the state of Tamil Nadu, and Tada in the state of Andhra Pradesh, was awarded to L&T Chennai Tada Tollway Ltd (L&T CTTL), a subsidiary of Larsen & Toubro Infrastructure Developments Projects Ltd (L&T IDPL). L&T CTTL is responsible for the planning, construction, operation and maintenance of the stretch; the company will also operate the motorway as a license holder for a period of 15 years after construction.

For the project, L&T opted for technically advanced yet cost-effective rehabilitation using cold recycling technologies from Wirtgen.

Cost-effective method

A thorough survey of the road surface condition is crucial to the success of in-situ recycling projects. This task was assigned to the specialists from the Indian Institute of Technology at Chennai University of Technology. They conducted a visual inspection of the section and took samples from along the entire stretch of motorway.

The results were a very mixed bag. In some places, the pavement was still fit for traffic, but about 12 km displayed massive damage to the entire bituminous surface: crazing as well as block, transverse and longitudinal cracks were discovered, as were deep ruts.

The cause for the heavy localised damage was readily identifiable. In 2012, some 30,000 vehicles used this stretch every day, approximately 30 percent of which were heavy goods traffic to and from the busy ports of Chennai and Ennore.

All transport to northern India is routed from those ports via the NH-5. In the light of these baseline conditions, the planners decided on a design with 84 million ESALs (ESAL = Equivalent Standard Axle Load) that can meet the most challenging demands. They also stipulated a minimum useful life of 20 years.

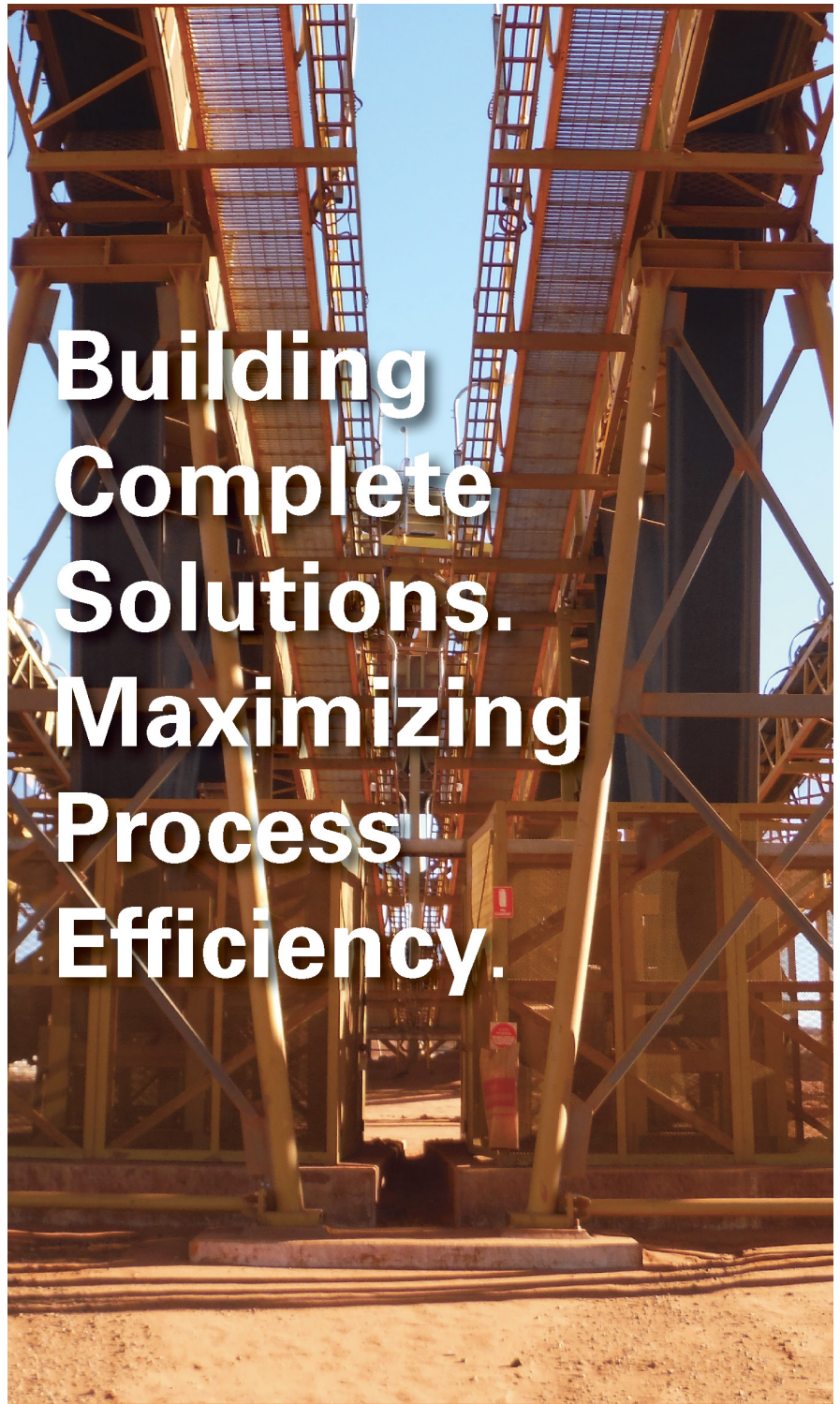
There are many reasons why this method is so cost-effective, one of which is the low requirement for construction materials. In-situ recycling requires only small amounts of new aggregates or asphalt. This was a crucial advantage in rehabilitating the NH-5 as there are no quarries in the Chennai region. "Also, only small amounts of cement, water and bitumen are needed," said Arashdeep Singh, cold recycling specialist at Wirtgen India. "This yields tremendous savings in transport costs."

"The energy requirement for heating is also very low due to the materials being processed cold. Only the bitumen is processed on site at a temperature of 175°C," added Mr Singh.

Cold recycling

As soon as the formula for the cold recycling mix was finalised, the Wirtgen WR 2400 recycler started working. This machine granulates the road surface with a robust 2.40-m-wide milling and mixing rotor, mixing the granulate with binding

Continued overleaf...



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Subsequent compaction with the Hamm 311 compactor.

agents and other additives. This way, it transforms a ramshackle road surface into a high-quality and hard-wearing base course in a single pass.

The addition of the binding agent and other additives is a simple task. On the NH-5, a grader in front of the recycler spread the crusher dust over the road surface. An SW 16 MC binding agent spreader from Streumaster then spread the cement uniformly across the area. Directly behind this, a WR 2400 recycler rated at 420 kW pushed a bitumen and water tanker ahead of it. These were coupled to the recycler with push rods. Behind the wheeled machine, various heavy duty Hamm compactors compacted the prepared base course. The WR 2400 recycled some 4,000 sq m per day with a working depth of 26 cm and a typical speed of 7 m/min.

Depending on the equipment version, the WR 2400 can process soil or road surfaces with water, bitumen, cement or lime. "On the NH-5, it was equipped with a foamed bitumen system. This produces a foam consisting of hot bitumen, water and air in special-purpose expansion chambers. The requisite quantities of additive are precisely metered via the control system to produce a foam with the specified properties. This is then injected via a spray bar directly into the milling and mixing chamber," explained Mr Singh. The total quantity of foamed bitumen required is determined by microprocessors, as is the quantity of water.

The width of the milling and mixing rotor cannot be altered. However, the addition of water and binding agents can be varied across the width by deactivating individual nozzles in the spray bar. The 9-m-wide surface of the NH-5, for example, was recycled in four lanes. To this end, the WR 2400 processed the first lane at its full working width of 2.40 m and the next two lanes at a width of 2.30 m

(full working width + 10 cm overlap). On the final lane, water and foamed bitumen were only applied across a width of 2.10 m.

The compaction work directly behind the cold recycler was handled by a Hamm 3520 P vibrating padfoot compactor. This process aims to reduce the cavities filled with air and water and thus increase the density and load-bearing capacity of the layers. The subsequent compaction phase was carried out by a Hamm 311 compactor.

In the final pass, the moist surface was sealed with tandem and rubber-tyred rollers. "Then we just had to clear everything away. The freshly recycled section that now serves as a new base course was subsequently reopened to traffic – in places just a few hours after being recycled," said S. Elangovan, project manager at L&T IDPL.

At last, Wirtgen's machines moved onto the jobsite following completion of the recycling work, to produce the 4 to 5 cm surface course above the recycled base course. M/S GVR Pvt Ltd, a subcontractor of L&T IDPL, used a Vögele Super 1800-2 together with a fleet of Hamm rollers.

L&T processed a total of approximately 142,000 sq m from October 2012 to April 2013. A team from Wirtgen India headed by service engineer Siva Kumar provided support on the jobsite during the entire project. He assisted, advised and helped with configuration and maintenance of the recycler and rollers. The machine operators had been trained in advance by trainers from the service team at Wirtgen India. At the headquarters in Pune, the machine operators were familiarised in depth with the special characteristics of cold recycling and the operation and maintenance of the machines from Wirtgen, Hamm and Streumaster. ■

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NH 1 HIGHWAY



Above: In the course of redeveloping the road between Jammu and Udhampur, about 150 bridges and numerous tunnels had to be built in the extremely inaccessible terrain of the Himalayas.

The National Highway Authority of India is redeveloping the route from Jammu to Udhampur, a stretch on the National Highway 1 or NH 1. Upon completion, the road will be extended from two to four lanes and will result in travelling time being reduced to approximately six hours from the present 10 hours. In early 2014, Mumbai-based Afcons Infrastructure Limited received two tunnelling contracts as part of the project.

Difficult environment

In the course of redeveloping the highway, around 150 bridges and numerous tunnels had to be built in the extremely inaccessible terrain of the Himalayas. Afcons thus found itself facing quite special challenges in executing the project. First and foremost, the climatic conditions are extreme, varying from very high temperatures in the summer to pronouncedly low in the winter, with snowfalls and monsoon rains. In addition, the construction sites are located in a remote area with the route leading through a wildlife sanctuary located at Nandini. As a result, drill and blast was precluded from the very outset and conventional driving was plumped for.

Over a length of 65 km of the NH1 Highway between Jammu and Udhampur, Afcons was engaged in producing four twin tube tunnels with a total length of 1.5 km each. The project that began in 2011 was completed in September 2014. At one point Afcons was three months ahead of what is already an ambitious schedule.

A major complexity on the project was the geology, which is typical for the young Himalayan chain. Poor quality, broken rock with dolomitic limestone, and firestone lentils with high silicate content are mainly to be found. Rock class III to V, with strength of 60 to 100 MPa and volume weight of 2,7 t/cu m, is prevalent. The RMR (rock mass rating) index amounts from 40 to 60. "The rock can collapse at any moment so that we must support the face quickly," said Mihir Mishra, deputy general manager (CPE) at Afcons headquarters in Mumbai, who is responsible for equipment acquisition.

Four twin tube tunnels

The design of the four twin tube tunnels (148, 250, 469 and 550 m long), with a total length of approximately 1.5 km each, is straightforward. The tunnels have a gap of 25 to 30 m between them, and in the case of emergency, every tunnel can be used for evacuation. The tunnels were constructed by conventional mechanical cutting methods (NATM). The portals at the accesses to each tunnel are supported by steel arches over a length of 10 m and are lined by placing a layer of wet shotcrete with steel fibre meshing. Sandvik DT820 tunnelling drill jumbos were used in this tunnelling project.

Due to the sensitive nature of the local environment (Nandini nature sanctuary) and taking consideration of the local inhabitants, a mandate to use conventional mechanical cutting methods (non-blasting operation) in tunnel excavation was imposed. This meant that at the face of the tunnel, the jumbo is used for drilling profile holes. The profile holes act as guiding lines for the mechanical cutting excavation; the 3 m deep drill holes are created in order to be able to excavate the correct cross-section (tunnel profile). The actual excavation was done by different methods of mechanical cutting: roadheaders, drum cutter and vibro-ripper attachments. The resulting residue was loaded by excavator on large dumpers and then transported out of the tunnel.

Sandvik jumbos were also extensively used for rock stabilisation and roof bolting. For rock bolting, hole diameters between 54 and 64 mm with a depth of 4 to 10 m, were used. When very poor rock (Class IV and V) was encountered the Sandvik jumbos were also used for pipe roofing – or umbrella drilling – applications. A pipe roofing kit was retrofitted to both jumbos for this purpose, and steel



pipes with 114 mm diameter and depths of 12 to 15 m were inserted by the jumbos. Along with the DT820s, Afcons also used Sandvik rock tools for profile drilling, roof bolting and pipe roofing applications.

The Sandvik DT820 itself is a hydroelectric underground drill rig equipped with two booms and a utility boom as well as different optional instrumentation levels. Its coverage area ranges from 12 to 110 sq m, with a hole diameter ranging from 43 to 63 mm and the length from 3,440 to 6,180 mm. The Afcons jumbos were equipped with a TFX-10/14 ft telescopic feed and a pipe roofing kit. With this equipment, it was possible to drill a tunnel of 8.42 m in height and 14.21 m in width. Work progressed well with an average advance rate of 14.5 m per day, which meant that excavation work was finished in June 2014.

Sandvik service engineers Rohit Singh Pawar and Virender Kumar worked together with Afcons engineer Murali Patel Virender Singh. Their tasks ranged from training the operators to giving assistance to the Afcons mechanics. The Sandvik service team also took orders for spare parts and repaired the machines if and when needed. In addition, they planned the deployment times for the machines and worked out the service plans



Top and above: Over a length of 65 km of the NH 1 Highway between Jammu and Udhampur, Afcons was engaged in producing four twin tube tunnels with a total length of 1.5 km each. To help with the work, Afcons opted for Sandvik DT820 tunnelling drill jumbos.

adapted to these deployment times. In this way, the jumbos were available for use at all times. Spare parts and rock tools were

dispatched to site from Sandvik distribution centres in India. ■

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THE SPANISH AFFAIR



A NMOPYC, the Spanish Manufacturers' Association of Construction, Public Works and Mining Equipment, was founded in 1982 and currently has 95 member companies. The equipment manufactured by the Association's member companies can be classified into the following groups: road equipment; concrete; construction lifting, transport and handling equipment; quarries, mining and recycling; earthmoving; temporary works equipment; and auxiliary equipment for construction.

ANMOPYC's primary aim is to represent the interest of its members and help strengthen their presence in foreign markets. Spanish equipment meets the European standards and has been used in a wide range of projects around the world.

For the past few years, ANMOPYC has intensified its global marketing activities, with the collaboration and support of ICEX, the Spanish Institute for Foreign Trade. Many ANMOPYC members have also reinforced their commitments in the Asian market, some of which recently talked to Southeast Asia Construction. These companies and their innovations are featured in the next pages (from 82 to 93). ■

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SANY

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Dealers Layout Map of SANY Group Asia-Pacific Region

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PEOPLE'S REPUBLIC OF CHINA

SANY Regency

- Asia International United Sole Co. (Zhang Wenhui)
- Maxcrane Machinery Co., Ltd. (Chawee Chaitongpatana)
- Thai Yont Equipment Co., Ltd. (Yotuwat Rongrakachit)
- Thai Sun Inter Machine Company Limited (Wang Yang)
- SANY** Good Top Machinery (Cambodia) Co. Ltd. (XU WEN DIE)
- United Equipment Services Sdn Bhd (Chang Bar Kuei)
- TOP-MECH PROVINCIAL (Ter Leong Leng)
- Surway Enterprise (1988) SDN. BHD (Yech Yuen Chien)
- Land Equipment Private Limited (Michelle Chua)
- Yinzhan Holding Pte Ltd (James Lim)

- PT. JIMAC Perkasa (Benry Kumajaya)
- PT. KONSTRUKSI INDO MACHINERY (Fui Mula Kih)
- MLA HOLDING PTY LTD (Matthew)
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(Zeng Kunlu)

中富(亚洲)机械有限公司
China Wealth (Asia) Machine Ltd.
(Chen Yuejin)

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CIVIC Merchandising, Inc.
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AUSA



Above: AUSA dumper (left) and Taurulift all-terrain telescopic telehandler working on a project.



Left: AUSA forklift at the company's factory in Barcelona, Spain.

Right: AUSA mobile concrete mixer.



AUSA was established in 1956, initially producing a microcar (PTV brand) for the automotive industry. The company's first dumper was introduced in 1961, followed by its compact rough terrain forklift in 1967. Two years later, AUSA expanded overseas with a subsidiary in Perpignan, France.

During 1980s, AUSA produced the DV 17, a multitask vehicle designed for municipalities and the 750 l self-loading concrete mixer. The company also consolidated its presence worldwide and opened three subsidiaries - in Madrid (Spain), in Brazil and in Mexico. By late 1990s, AUSA already established a new representative office in China and entered the US market.

The company launched its CH130/150 forklift trucks in 2000, and Taurulift T204 H and T 276 H telehandlers in 2008. In 2006, the company rolled out its 100,000th machine.

Now specialising in compact industrial vehicles, AUSA operates from its headquarters in Barcelona, Spain and exports to over 100 countries through its worldwide network of dealers.

Construction machines

AUSA manufactures compact equipment, some of which are designed for load transportation, material handling and concrete production in

the construction sector. These machines are suitable for applications where a narrow access or rough terrain capability is required.

The company's rigid and articulated dumpers feature capacities ranging from 850 to 10,000 kg. There are 4WD, 2WD, mechanical, hydrostatic and torque converter transmissions available in combination with front, height and swivel unloading hoppers. The company's rough-terrain and semi industrial forklifts have capacities between 1,300 and 5,000 kg. They can handle heavy loads and large volumes on rough and sloping terrains.

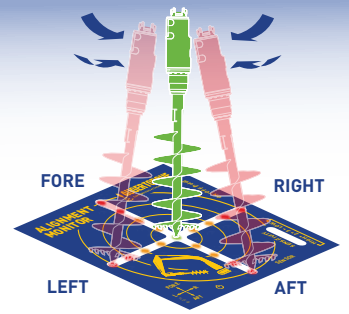
AUSA's Taurulift all-terrain telescopic telehandlers, with capacities from 1,350 to 3,000 kg, offer a range of models that can be used in open spaces under very extreme conditions as well as very narrow semi-enclosed spaces with difficult access. The versatility of the telescopic arm allows positioning both at height and to the front, and the light weight makes them suitable for working in limited access areas with fragile soils, preventing soil erosion.

In addition, AUSA's self-loading mobile concrete mixers feature a compact and simple design, with 0.5 and 1.1 cu m capacities. Its rough-terrain multitask vehicles have capacities ranging from 1,500 to 3,500 kg, which can be used in various environments. ■

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ALSINA



All images: Alsina offers various formwork systems for a wide range of applications such as tunnels, buildings, bridges, dams, water treatment plants, reservoirs, power plants and maritime works, among others.



Alsina started as a wood workshop business in 1950, supplying wood to the neighbourhood carpenters. After some time, the company offered pinewood for building works - the old system used by operators inspired the need for innovation in the formwork systems that would characterise Alsina from then on. Soon new wood related products were created, and Alsina grew and began to experiment in order to provide better solutions for the shuttering process in the workplace.

Since then, Alsina has put a lot of effort to maintain innovation, research and development as a priority, constantly creating new formwork systems, both recoverable and non-recoverable. These formwork systems have also become the star products of the company, such as Alisply, Mecanoflex, Multiform or Alumecano, used in construction projects worldwide.

Today, Alsina is a global company specialising in the design, manufacture, sale and rental of formwork systems for a wide range of applications. Based in Barcelona, Spain, the company has presence in Europe, North Africa, North America, Latin America, Middle East and Asia.

Various formwork systems

Alsina's slab formwork systems are suitable for all types of solid

slabs, lightened slabs and hanging beams. The company also offers shoring elements for slab formwork systems. The variety of props covers a height range from 1.5 to 6 m.

Alsina's climbing systems include one-sided wall, interior climbing platform and two-sided climbing platform with or without movement of the annexed formwork. The systems are compatible with the company's range of wall formworks.

Alsina's Multiform system for civil works consists of double UPN steel beams and wooden beams. The company can make slabs, formwork tables, columns and pillars of all geometries, straight walls, curved walls, one sided walls, bridge decks and climbing elements.

Alsina's column formwork systems are designed for all kinds of pillars: light, with crane and metallic. Furthermore, the systems developed by Rubrica Engineering, Alsina's partner, comprise design solutions for any type of formwork section and situation adapted to the needs of the project and its changing demands.

A wide range of accessories are also available for the entire range of Alsina's systems - from shuttering boards, phenolic plywood, shoring systems and systems for moving material on the job site to consumables used to implement walls, one sided walls and climbing platform walls. ■

Website: www.alsina.com



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SERVIPLEM



Above (left and right): Serviplem manufactures concrete mixers on trucks and semi trailers, dry bulk tanks for transporting cement and powdery materials, and batching plants.

Below (left and right): Serviplem's headquarters is located in Zaragoza, Spain, along with its main factory.



Serviplem manufactures concrete mixers on trucks and semi trailers, dry bulk tanks for transporting cement and powdery materials, and batching plants. The company's headquarters is located in Zaragoza, Spain, along with its main factory. Serviplem also has assembly and manufacturing partnerships in Cuba, Russia, Saudi Arabia and the UAE.

In April 2012, Serviplem was acquired by Tata-Hitachi Construction Machinery Limited (THCM), a joint venture between Hitachi Construction Machinery Co (Japan) and Tata Motors Limited (India). THCM involves in the design, manufacture, sales and service of a wide variety of construction equipment including hydraulic excavators, wheel loaders, dumpers, backhoe loaders, etc.

Serviplem manufactures its products under the brand name Baryval. Its concrete mixers range from 4 to 12 cu m mounted on trucks, and from 7 to 15 cu m mounted on semi trailers. The concrete mixers are made of Domex steel, which is highly resistant to wear and tear and features high elastic limit. Serviplem offers a new design of Baryval semi trailer with a capacity of 12 cu m, three axles, pneumatic suspension and an 800 l pressurised water tank.

This lightweight unit is also produced with Domex anti-wearing steel and has a low centre of gravity. Optional safety features include emergency stop, drum brakes, anti-jumping, constant speed drive (CSD), anti-trap, aluminium or plastic mudguards, sliding ladder and plastic prolongation foldaway.

Serviplem's batching plants are available from 30 to 160 cu m. They comprise ready mix concrete plants (CHTM), dry batch concrete plants (CTHD), precast concrete plants (CTP), mobile concrete plants (CHM1-50), tower plants and dry mortar plants.

Serviplem's dry bulk tanks are offered in aluminium and steel, with capacities of 32, 36 and 38 cu m. They are designed for good stability and manoeuvrability when loaded, as well as excellent load distribution between axles and kingpin, thereby avoiding excessive load on certain parts of the tank.

Serviplem can also customise its products based on customer needs. Some special applications include mixers in concrete plants, multi lift (special multi-chassis system), blender for concrete manufacturing and fastening for container system, to name a few. ■

Website: www.baryval.es



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RESIMART



Resimart specialises in the design and manufacture of facilities, machinery and accessories for precast concrete. The company employs both the vibro-compression and extrusion technology.

The vibro-compression technology is used for manufacturing all kinds of prestressed products by means of a continuous process (beams, hollow core slabs, hollow beams, panels, seating products, etc). The extrusion technology is used for continuous production of hollow core slabs up to 500 mm in the standard model and up to 600 mm in the special version.

According to Resimart, the main advantage of vibro-compression technology is the possibility of manufacturing a lot of different products with one machine, and the mould can be changed within five minutes. The extrusion technology's main advantage is that it is capable of manufacturing hollow core slabs with great heights using less concrete (reducing costs), achieving lighter and stronger products.

Resimart also offers turnkey services, providing its customers with a complete solution on factory building, assembly of the installation, performing the start up and teaching the workers who manage the production in the future.

Resimart is headquartered in Valencia, Spain. Its machinery and



All images:
Resimart
specialises in
the design and
manufacture
of facilities,
machinery and
accessories
for precast
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equipment are present in more than 300 factories around the world. The company is currently working on several projects in Russia, Kazakhstan, Senegal and Mexico. ■

Website: www.resimart.com



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LINDEN COMANSA



Above: Linden Comansa luffing-jib cranes being used on the National Art Gallery project in Singapore.

Below: Linden Comansa luffing jib cranes offer various capacities ranging from 8 to 30 t.



Linden Comansa started its activities in the early 1960s as jig and tool makers - the company was then known as 'Imausa' - supplying mainly to the larger subcontractors in the automotive industry. Due to Spain's strong industrial expansion during this period, Imausa further produced, in addition to more sophisticated jigs and tools, machine tools both for internal and external use, along with prefabricated steel structures for industrial buildings.

The birth of the Spanish tourist industry - soon to become the world's largest - with its parallel demand for housing, schools, hospitals, etc, made Imausa's entry into the crane market a natural progression. The first cranes produced were simple, saddle-jib cranes ideally suited to the building methods of that time, featuring capacities ranging from 12 to 42 tm. By 1970s, Imausa had produced saddle-jib cranes with a 200 tm capacity.

In 1983, Imausa acquired the Swedish crane company Linden - which at that time was part of Linden-Alimak Group - and Linden Comansa was born. The Linden 8000 modular system crane, which was manufactured in 1977, was added to the Linden Comansa range of cranes offered to customers around the world. After the acquisition, Linden Comansa developed its 1100 and 2100 modular system cranes, along with the LC 500 modular system 'flat-top' design cranes with capacities ranging from 35 to 56 tm.



Above: The 30LC1450 flat top crane (on the right) is Linden Comansa's largest tower crane to date.



Right: Linden Comansa cranes are designed based on the modular system.

According to Linden Comansa, the modular system is one of the company's main advantages over its competitors. It allows customers to modify their crane without adding new parts, to meet the different needs of their projects. As such, overall manufacturing process can be reduced resulting in lowered costs and simplified supply lines.

In 2006, Linden Comansa formed a joint venture in China with Jie Holding Group to establish Comansa Jie. Earlier this year, the joint venture came to an end and Comansa Jie was changed to Comansa Construction Machinery (Hangzhou) Co Ltd - known as Comansa CM - with Linden Comansa being the sole owner of the company. The cranes manufactured by Comansa CM are mainly sold in China, India and Southeast Asia.

Speaking about the impact of financial crisis in 2008, Ralf Hagededt, Linden Comansa's area manager for Asia and northern Europe, said that "although Linden Comansa's local market dropped significantly during the crisis, the strong growth of the Chinese JV in the Asian market helped to lift the company's overall revenue."

Mr Hagededt also mentioned that the Spanish market has shown signs of recovery in the past year. As for the global market, he said, "The Asian market is generally still good - it has been quite consistent throughout the years - and so are the Scandinavian countries. The US market is coming back, while the UK market is starting to grow again."

Largest flat top crane

The 30LC1450 is Linden Comansa's largest tower crane to date, which is manufactured at the company's headquarters in Huarte, Spain. It is

one of the models in the company's LC3000 series; the other model is the 30LC1100. "Bigger cranes are now in high demand, especially in Asia," said Mr Hagedstedt.

The 30LC1450 comes with three different versions: 32 t, 48 t and 64 t. The crane is designed mainly for heavy-duty construction works and the mining industry. It can be erected with jib lengths from 40 to 80 m and with jib sections every 10 m. The maximum freestanding height is 88.8 m, but it can reach greater heights with tie frames, for example, 198.3 m with just two tie frames.

A 5.5 m wide tower section also helps to reach higher freestanding heights. In addition, the tower sections of the LC3000 series can be combined with the tower sections of other Linden Comansa cranes, such as the 21LC750, in order to reach major freestanding heights.

The 30LC1450 can be erected with fixing angles or over a 10 m wide 'H' base. The crane also features a hoist mechanism of 200 kW with frequency control, drum with a capacity for 1,450 m of wire and Linden Comansa's double trolley system with automatic reeving change.

Luffing-jib cranes

Linden Comansa's Huarte factory also manufactures luffing-jib cranes, the LCL series. They include the LCL 310, LCL 280, LCL 190, LCL 165 and LCL 500, with capacities ranging from 8 to 30 t. Most jib sections are interchangeable between these models. The tower sections are interchangeable not only with the cranes in the same series, but also with the cranes in the flat-top series.

The LCL series' hoist mechanism is located at the front, under the jib and near the cabin. The luffing mechanism, with its emergency second brake, and the electrical cabinet for the control of the crane are placed on the counterjib. Such design allows the reduction of the installation weights and the slewing radius of the counterjib. Furthermore, hoisting and luffing cables come preinstalled from the factory for faster installation of the crane.

The LCL series can be erected with either a 6 m wide cross base or an 8 m wide cross base, which can be folded for easy transportation in a truck or container. The 8 m base can also be used with other models



Linden Comansa flat-top cranes at work on the Nhat Tan Bridge project in Hanoi, Vietnam.

of Linden Comansa cranes to increase the heights up to 30 percent. ■

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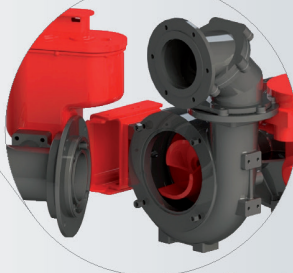
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ENARCO



Above (left and right): Enarco manufactures various types of concrete vibrators, concrete screeds and light compaction equipment. The company's products have been used on a wide range of projects around the world.

Below (left and right): Enarco positions itself as a specialist in concrete vibration equipment.



Founded in 1964, Enarco manufactured pneumatic tools with its own technology. The company concentrated on the domestic market and the UK, and soon became a major supplier in the national metallurgical industry with customers such as Mercedes, Seat, Ford, Renault, Fagor, Teka, Otsein and Astilleros Españoles.

The growth achieved by Enarco was very significant until, in 1978, due to the economic instability in Spain, an organisational restructuring was carried out to face a new stage in its development. Then pneumatic, pendulum and motor-in-head concrete vibrators were added to the company's product range, as well as vibrating screeds for paving surfaces.

Enarco's new activity was focused on the market of vibration applied to construction technology and more specifically, to vibration of concrete. Meanwhile, as the product range was being expanded and the company was achieving growth within the new market, the

production of pneumatic tools gradually decreased, and by 1992 was merely residual. In 1994, a range of light compaction units was developed by Enarco - it was believed to be the first Spanish company with its own production of tamping rammers and reversible compacting plates.

Today, Enarco manufactures various types of concrete vibrators, concrete screeds and light compaction equipment. The company's headquarters is located in Zaragoza, Spain, which also includes a 10,000 sq m manufacturing plant inaugurated in 2009. In addition, the company has developed global networks in five continents and subsidiaries in France, Mexico, Poland and China.

Since the financial crisis in 2008, Enarco has put a lot of emphasis on the export markets. According to J.Luis del Prim, CEO of Enarco, the company's main markets are currently Europe, South America, Southeast Asia and the Middle East. It also recently

entered Africa. "Developing countries offer good prospects for us in the future, so we are always open and keen on collaborating with relevant companies in these countries," he said.

In the Southeast Asia region, Malaysia, Singapore, Indonesia and the Philippines are highly potential markets for Enarco, said Mateo Barbot, Enarco's export sales manager in charge of Southeast Asia. "Our growth in the Southeast Asian market is about 10 to 20 percent every year now."

Concrete vibrator specialist

Enarco has positioned itself as a specialist in concrete vibration equipment. Two of the company's most popular models in Asia include the Dingo and TNR/ANR.

The Dingo portable electric vibrators feature a frequency of 50-60 Hz, weigh 5.8 kg and can compact up to 35 cu m per hour of concrete. They have an oversized motor with double insulation; shock proof handle to protect the motor; high resistance housing; filter in air inlet that is easy to replace; belt for hanging from shoulder; and self disconnecting brushes. Moreover, the Dingo series has vibrating heads with five different diameters, ranging from 25 to 58 m. The shaft is available from 0.6 to 6 m long.

The TNR and ANR pendulum vibrators produce a 12,000 rpm frequency from a rotation at 3,000 rpm in input. They feature high vibration amplitude and are powered by electric motors or petrol/diesel engines. The hose has a diameter of 36 m, except for ANR25, which is 25 m. ■

Website: www.enar.es



Enarco's headquarters is located in Zaragoza, Spain, which also includes a 10,000 sq m manufacturing plant inaugurated in 2009.



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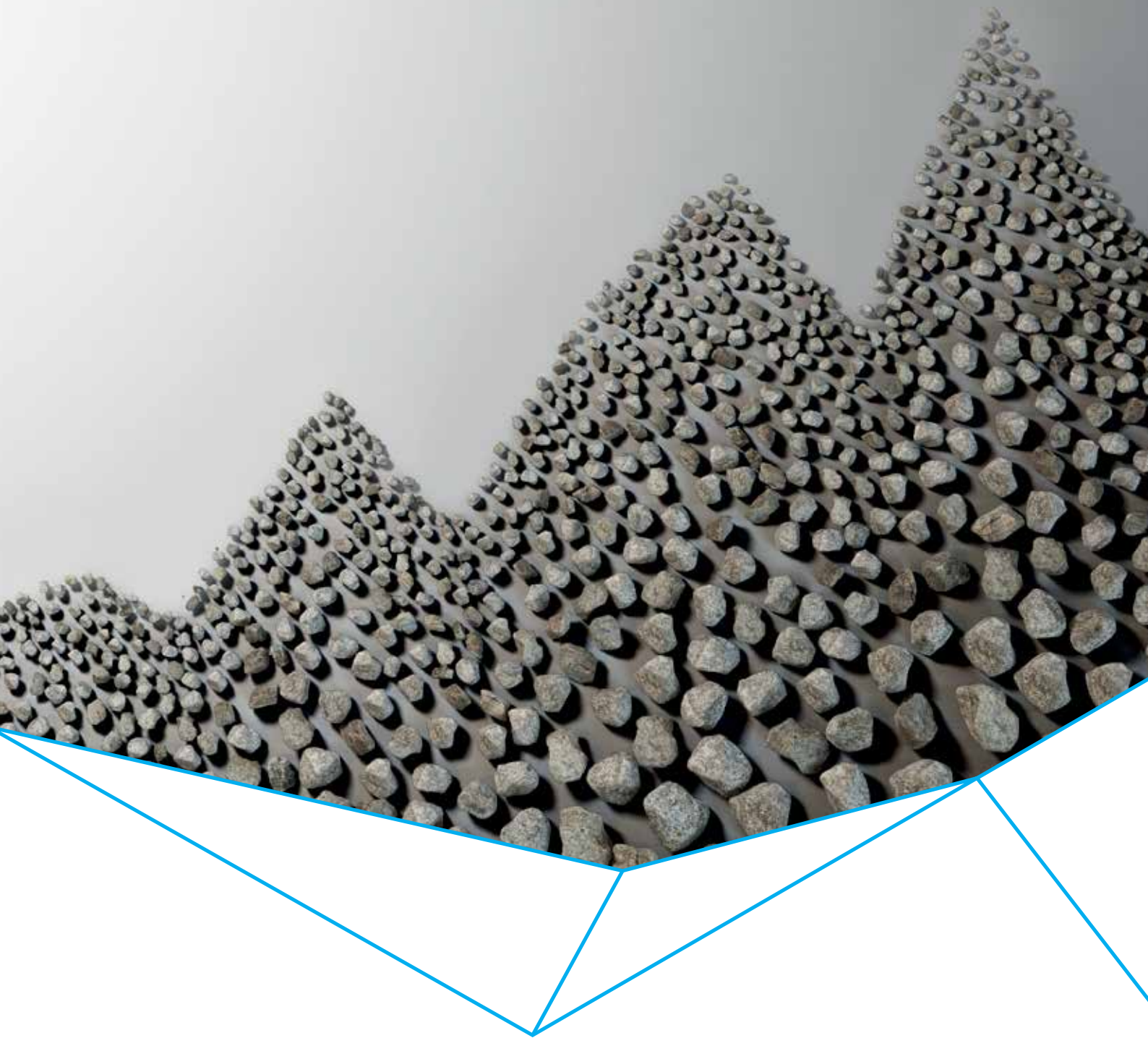
World of Concrete (WOC) 2016, the industry's annual international event dedicated to the commercial concrete and masonry industries, will take place from 2 to 5 February 2016 at the Las Vegas Convention Centre, Las Vegas, Nevada, USA.

The show is expected to be bigger than the previous edition, with more exhibitors from around the world exhibiting in special product and action areas, including The Producer Centre, a marketplace of materials, equipment, demos and seminars for concrete producers; Material Handling, offering trucks, excavators and more for material delivery, distribution, concrete placement and earthmoving; Concrete Repair and Demolition, housing a display of surface preparation equipment, scarifying, sawing equipment, concrete repair and other demolition products; World of Masonry, showcasing products, tools, information and technology for masonry professionals; Technology for Construction, featuring the newest products and tools for the commercial construction industry from top information technology and systems providers; and Concrete Surfaces and Decorative Pavilion, showcasing the popularity of decorative concrete for both commercial and residential applications including concrete coatings, waterproofing products and technologies, etc. WOC will also launch a new area on the show floor for precast concrete, highlighting the latest products and technologies in the precast/prestressed sector.

The education programme will feature seminars, hands-on training events, interactive workshops and live demonstration, as well as certification seminars and examinations. In addition,



Continued on page 96...



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Continued from page 94...



there will be construction boot camps for field management, which address business management challenges (all-day workshops tailored for management-level professionals); and technical workshops with live demonstrations (expert-led workshops and live demonstrations highlighting different concrete applications).

WOC will continue to bring international buyers together with US exhibitors to expand business domestically and overseas. For the 11th consecutive year, the US Department of Commerce has selected WOC as a participant in the International Buyer Program (IBP). The show draws significant attendance at each event working with the Department of Commerce Commercial Services posts from around the world.

World of Concrete 2015 attracted more than 55,000 professional registrants and showcased just over 1,400 leading suppliers. ■

Website: www.worldofconcrete.com



All images: Scenes from World of Concrete 2015.



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OCEAN DIAMOND

BOOTH: S13330

The DiaRACE 460 from Ocean Diamond is suitable for smaller jobs, homes and offices. This planetary grinder features counter-rotating grinding heads. It also has single-phase input power with adjustable voltage, 110 V or 220 V.

The DiaRACE 460 is versatile and can be used for coating removal, grinding and polishing. Although the machine has single-phase input power, it is a full three phase unit internally with variable speed and forward and reverse, making it highly reliable.

The DiaRACE floor grinding plates are available in soft, medium and hard bonds. Extra hard and extra soft bonds are also available upon request. In addition, there are trapezoid, quick change and other styles to fit various floor grinders.

The DiaRACE floor polishing discs have resin, copper/resin, metal/resin and ceramic bonds.

The DiaRACE 10-in diamond discs are excellent for removing floor coatings, levelling and smoothing concrete floors. They are available in soft, medium and hard bonds. These diamond discs come with a universal bolt hole-pattern to fit most floor grinders on the market. They are ideal for both dry and wet use.

Ocean Diamond also offers DiaRACE cup wheels with various styles and customised designs. ■



Above: DiaRACE floor grinding plates.
Right: DiaRACE 460 grinder.



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MINNICH

BOOTH: C5184

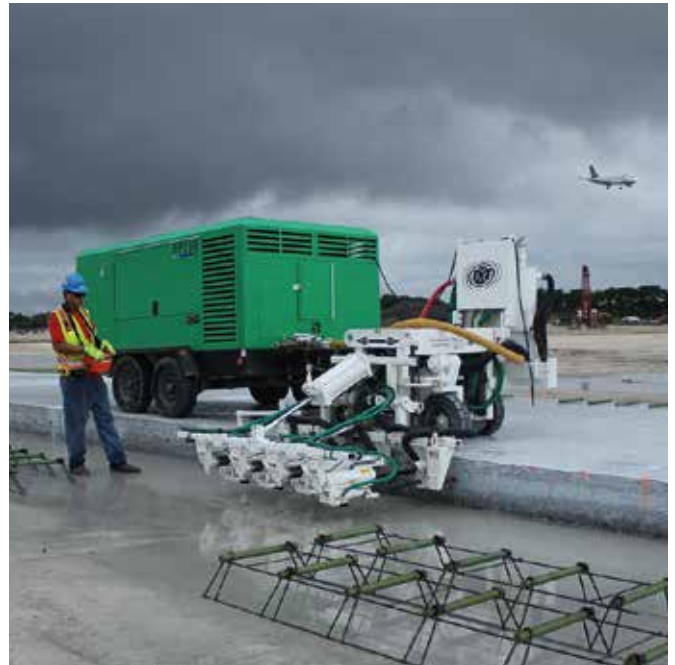
Minnich's dowel pin drills provide an innovative and safe solution for dowel pin drilling - an integral process in road construction projects. Offered in both on-grade and on-slab models, ranging in capacities from a single drill up to a five-gang drill unit, Minnich's dowel pin drills are versatile and efficient. They are available in various sizes and configuration, and have been used in roadway and airport runway jobs around the globe.

The machine-mounted units provide contractors with a quality dowel pin drill for patchwork applications. The Minnich lineup of machine-mounted units can be equipped to the boom of an excavator or backhoe, or on the mounting plate of a skid steer loader, and provide a high-level of manoeuvrability on expansive jobsites where the work to be performed may not be confined to a small area.

In addition, many construction companies require specialty drills custom-built to demanding specifications. Apart from offering a range of standard drills, Minnich has complete customisation capabilities to meet exact customer needs.

Minnich also offers a complete line of concrete vibrators and vibrator monitoring technology to aid in the process of properly paving concrete. ■

Right: Minnich's self-propelled wireless drills.



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The Gator PSS PCS are designed to complete three jobs at once, dewatering, washing and classifying.

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ATLAS COPCO

BOOTH: C4641

The Atlas Copco TEX 830 rivet buster gives contractors a lightweight and easy-to-use tool for demolishing concrete, metal and steel on construction and renovation jobs. The rivet buster has an 8-in stroke, weighs just 30 lbs and generates as many as 1,140 bpm for consistent, hard-hitting power.

The TEX 830 features a 6-ft whip hose with a claw coupling to minimise setup times. Contractors simply push and twist the coupling to quickly attach the hose to an air compressor and are ready to go. The unit requires 44 cfm to operate, so contractors can use it with a compact and cost-effective compressor, such as Atlas Copco's XAS 90. Atlas Copco offers the rivet buster with a pistol or D-style handle for optimal comfort at a variety of angles. It is used with an 11X jumbo shank and a variety of tool steel, such as 10-, 12- or 18- in moil points or narrow chisels.

The TEX 830's teasing throttle adjusts easily for optimal control and accuracy and its long stroke delivers consistent, high-impact energy for fast and effective demolition. In addition to the 8-in stroke TEX 830, Atlas Copco also offers 6- and 11-in rivet busters to suit a wide range of applications.

The Atlas Copco LP 13-30 P gas-powered hydraulic power pack delivers 5-8 gallons

The Atlas Copco LP 13-30 P rivet buster (right) and LP 13-30 P gas-powered hydraulic power pack.

of oil per minute at 2,200 psi for effective use with a wide range of hydraulic tools, including breakers, chippers, core drills, post drivers, pumps, rock drills and saws.

Atlas Copco designed the power pack with its Power On Demand system that idles the engine when the tool is not in use, and speeds it up as needed. This saves fuel during idle periods and allows operators to work longer between refuelling. The POD

system also minimises noise and vibrations, allowing contractors to work comfortably and in noise-restricted areas.

The LP 13-30 P is 24 in wide, 29 in long and just 28 in tall, so rental centres can store it on shelves and contractors can fit it easily in the back of a truck or van. The power pack weighs just 220 lbs and is equipped with wheels for easy manoeuvrability around the jobsite. ■



WAGNER METERS

BOOTH: S11449

Wagner Meters' Rapid RH moisture testing system is designed for projects where moisture-sensitive floor coverings are going to be applied over concrete slabs. Contractors need to rely on the tests they perform and ensure the results are accurate, and available to any member who needs to know the current moisture conditions of concrete slabs in the work area.

The DataMaster is used in conjunction with the Rapid RH smart sensors and Bluetooth reader. Measurement of the concrete slabs' internal relative humidity and temperature can be obtained and transmitted with the system's Bluetooth technology. Data can then be uploaded to the Wagner reports site that helps ensure data integrity and proper data documentation has been maintained and is compliant with ASTM F2170-11 standards.

Flooring contractors and installers who require accurate moisture testing in wood and concrete slabs rely on Wagner's WFP400 professional flooring installer package. The components include the Rapid RH starter kit, MMC220 non-damaging wood moisture meter, Rapid RH DataMaster w/Bluetooth reader, Infrared (IR) thermometer and TH-200 thermo-hygrometer. This complete



Wagner's WFP400 professional flooring installer package.

package makes monitoring moisture content an easy process while providing reliable results that are designed to protect data integrity on every job site. ■

TEMPEST

BOOTH: S12750

Tempest Technology Corporation offers high performance and high-pressure ventilation tools for industrial work environments. Among its products is the Tempest PAL-30, which produces a powerful shaft of air to ventilate any job site. Its managed airflow enhances worker productivity by improving the working environment and provides for increased worker safety. Its signature frame design makes it highly robust. The PAL-30 delivers up to 15,000 cfm and is available with variable speed control. It has been used by contractors and the rental market for years.

Based on the high performance fan designs used for firefighting around the world, the Tempest 24-IND features a low profile roll cage frame, high cfm output shroud, blade, engine and a number of features that make it very easy to move, adjust and store. The 24-IND delivers up to 15,000 cfm and is available with variable speed control and explosion proof operation.



Tempest 24-HD (left) and PAL-30.

In addition, the 24-HD is manufactured for increased durability and ease of operation. With a structure design that makes it ideal for a wide variety of applications, this fan has quickly become a favourite among professionals in numerous industrial fields. Its roll cage body provides extreme

resistance to abuse and physical damage. The unit is designed to accept the Tempest Dust Containment bag, which collects and contains any airborne particles larger than 10 microns. The 24-HD also comes available with explosion proof operation and supplies close to 13,000 cfm. ■

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SANDVIK

BOOTH: C7174

Sandvik Construction's products for use in manufacturing concrete and cement are specifically built for the needs of this industry. These include mobile crushers and screens, crushing and screening plants, breakers, high capacity hybrid roll crushers, VSI's, components, conveyors and bulk handling systems. The company will also be providing information on its equipment and aftermarket operations, such as spare parts. ■



Sandvik CV229 VSI crusher.

ISOMAT

BOOTH: S13224

Isomat offers waterproofing materials, concrete and mortar additives, tile adhesives and grouts, repairing materials, plasters and paints, and floorings for various construction applications. Some of the highlights include Isomat PU Systems (polyurethane products), which consists of one-component waterproofing membranes, floorings, sealants, adhesives and primers; and Isomat Color System, a complete range of paints for exterior and interior use. Isomat has also developed a complete range of coloured decorative microtoppings for applications with distinctive styles and highly aesthetic results.

Isomat currently has three production plants located in Thessaloniki, Greece; Belgrade, Serbia; and Bucharest, Romania. With affiliated companies in Serbia, Romania, Bulgaria, Turkey, Russia, Slovenia and Spain, and a strong network of local distributors, Isomat has sold its products in more than 45 countries worldwide. ■



Isomat's various products for a wide range of construction applications.

BLASTRAC

BOOTH: S10117A & C

Blastrac is one of the global leaders in portable surface preparation technologies and equipment. The company manufactures environmentally safe shot blasting, grinding, scarifying, scraping and dust containment equipment.

A popular selling Blastrac steel shot blaster in the Asian market is the 500E Global. This new and improved horizontal shot blaster has an easily assembled modular construction to allow it to pass through narrow openings and hard-to-reach places for steel blasting and cleaning. Its greater blasting width is also ideal for ship decks and interior levels of large vessels.

The Blastrac 900VMB is the latest in Blastrac line of vertical steel shot blasters, suitable for medium and large-sized vertical steel blast cleaning jobs and applications. It is remote controlled for operator safety, comfort and productivity.

The Blastrac Road/Bridge/Runway line of equipment is designed for high production applications such as sub straight preparation for various surface treatments and restoration of pavement textures for traffic safety. The 2-4800DH is Blastrac's largest ride-on shot blasting system with a 48-in blasting width. The machine plays an important role in the Hong Kong, Zhuhai and Macao Bridge project, which includes blasting over 700,000 sq m of concrete surface and over 500,000 sq m of steel surface. The 2-4800DH has also been used during the construction of Lang-Qi-Min river bridge in Fujian province, China.

The Blastrac shot blast machines for steel surface, the EBE line, are perfect for all kind of steel surface in bridges, petrochemicals and shipyards (ship building and ship repairing). The Blastrac polishing line of products is ideal for applications that require surface preparations. The Blastrac grinding and polishing machines work with Blastrac line of dust collectors to provide dust free, environment-friendly working conditions. ■



Blastrac's 500E Global steel shot blaster.

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DORFNER

BOOTH: S12812

Dorfner will showcase its new Dorsicoat product range for installation of synthetic resin coatings without dust. Dorsicoat coated quartz sand and sand blends are used as fillers in resin-bonded coatings in the flooring industry, providing commercial and industrial flooring with excellent durability.

According to Dorfner, the elimination of dust during usage is a new feature that sets Dorsicoat fillers apart. It makes works much easier on site and improves occupational safety. The company also claimed that the quality of the coating is better, because dust-induced surface defects are eliminated. Dorsicoat reduces installation time per square meter, so the installation team can easily increase its productivity.

The Dorsicoat range includes Dorsicoat PQK, tailored specifically for EP and PU resin systems, and Dorsicoat PQW, which is ideal for acrylic resin. Dorsicoat fillers are formulated to meet the specific application requirements: mortar that has good plasticity and self-levelling coatings, which are extremely easy to



work with, and also to give the floor coatings effective anti-slip protection.

Dorsicoat products are designed to maximise occupational safety, and they are highly compliant with international regulations and legal requirements. Dorfner said that dust measurements conducted at IGF (a dust hazard research institute in Dortmund) on Dorsicoat products provided conclusive results. During measurements to assess the release of critical alveolar dust, all of the Dorsicoat products tested met the criteria in the most stringent category. Measurement of fine dust showed that Dorsicoat is well below the defined limit. Compared to standard quartz sand products, which are rated as low-dust, alveolar dust levels have been reduced by an additional 30 percent. ■

Left: Dorfner apparatus for demonstrating the dust formation characteristics of quartz sand products.

SOMMER ANLAGENTECHNIK

BOOTH: N1349

Sommer Anlagentechnik GmbH supplies production plants to the precast concrete element industry. The company's business is divided into several areas including stationary production on lines, folding pallets and tilting tables; pallet circulation plants for the production of slabs, double and massive walls in normal and light concrete; shuttle processing plant (SPP); multi-function-shuttering-robot (MFSR); insulation-process-application-robot (IPAR); shuttering for special purpose elements, such as variable rectangular shutterings, garage shutterings, transformer stations and moulds for rooms; shuttering for skeleton structures, such as moulds for columns, moulds for girders and moulds for TT-elements; transport and handling systems; accessories, such as shuttering and magnetic systems; control systems; and special machines according to customer's requirements.

Sommer pallet circulation plant can produce between 200 and 3,000 sq m. The automation degree of the plant can be adjusted based on the required capacity and local conditions. The plant consists of modules and can be tailored to meet nearly all market requirements.

The shuttle processing plant is a production plant for wall elements with shuttle tilting and processing machines. This system combines the advantages of carousel-system and stationary tilting tables. Advantages include low investment, easy to operate and lower maintenance as PCP. The production plant can also be operated on construction site, and it allows re-use of production tables in PCP if needed later.

The functioning principle of the multi-function-shuttering-robot (MFSR) combined performs the necessary demoulding and shuttering functions of a pallet circulation plant. Advantages of this technology include reduced costs and improved safety for the staff, avoidance of accident risks, smooth handling of shutterings, reduction of investments and saving of forming oil, among others. ■



Sommer's multi-function-shuttering-robot (above) and pallet circulation plant (below).





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