### Crawler Crane Series

**Multi-purpose lattice boom crawler cranes**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lifting capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKE-G series (European model)</td>
<td>60 ~ 250t</td>
</tr>
<tr>
<td>CK-G series (American model)</td>
<td>85 ~ 275t</td>
</tr>
<tr>
<td>CKS series (Standard model)</td>
<td>60 ~ 250t</td>
</tr>
<tr>
<td>7000S series (Standard model)</td>
<td>120 ~ 250t</td>
</tr>
</tbody>
</table>

**Duty cycle lattice boom crawler cranes**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lifting capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME-G series (European model)</td>
<td>80t</td>
</tr>
<tr>
<td>BMS series (Standard model)</td>
<td>80 ~ 100t</td>
</tr>
<tr>
<td>BMS1200HD (Standard model)</td>
<td>120t</td>
</tr>
</tbody>
</table>

### Large-sized crawler cranes

<table>
<thead>
<tr>
<th>Model</th>
<th>Lifting capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL-G series (European and American model)</td>
<td>300 ~ 550t</td>
</tr>
<tr>
<td>SL-S series (Standard model)</td>
<td>300 ~ 550t</td>
</tr>
</tbody>
</table>

### Telescopic boom crawler cranes

<table>
<thead>
<tr>
<th>Model</th>
<th>Lifting capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK series</td>
<td>55 ~ 75t</td>
</tr>
</tbody>
</table>

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A choice that speeds up the future.
Kobelco cranes offer a new dimension in work efficiency.
Tower Light Srl is putting the finishing touches to its latest innovation, MT1 mini light. The product has been designed to target the Asian market and will be formally unveiled at Bauma China in November.

The MT1 has a host of features and benefits each conceived to deliver safe, bright lighting for construction sites, outside events and highway projects. With its manually operated 5.5 m mast fitted with four 400 W metal halide lamps, this self-generating lighting tower is ideally suited for illuminating small and medium sized areas. As an option the MT1 can also be fitted with four 150 W LED energy saving lamps.

For added security, the MT1 is delivered with two adjustable stabilisers and a covered electrical coil cable alongside sturdy, lockable doors. Loading and unloading can be safely carried out via its central lifting hook and hand trolley, with a wide steering angle. Prolonged lighting is guaranteed from a 20 l metal fuel tank providing over 30-hours of running time on one single tank of fuel. Power is rendered through an integral 5 kVA diesel generating set, boasting whisper quiet noise levels at just 68 dBA at 7 m and there is a handy auxiliary power output socket for powering small tools.

The 3,000 rpm, Yanmar, air-cooled diesel engine, is fully protected with a series of alarms to protect the engine.

With the compact minimum dimensions of only 111 x 95 x 190 cm and weighing-in at a lightweight 352 kg, the MT1 can be swiftly installed on site.

Enquiry: info@towerlight.com

Volvo’s new truck range for Asian market

Volvo Trucks has launched a new range of trucks for the Asian market, which includes Volvo FH, Volvo FM and Volvo FMX. These heavy-duty trucks are designed to help improve productivity and profitability.

The new range features the ground-breaking Volvo Dynamic Steering (VDS) system, which delivers exceptional handling – pretty much like a car – in all operating conditions, and the intelligent I-Shift gearbox technology.

In addition, Volvo’s unique Dynafleet system allows following up on fuel consumption over time, and – together with Volvo Trucks Driver Training – coach drivers into further improving their fuel saving skills.

Telematics also enable the workshop to monitor key components, such as fuel usage, wear and tear conditions, and driver’s momentum, thus making it possible to reduce maintenance needs and avoid unplanned stops.

The Volvo FH features a new cab optimised for long haul challenges. An innovative truck built with the driver in focus, it is wired to make operations more efficient, more productive, safer and more comfortable for long distance transport.

The new Volvo truck range includes Volvo FH, Volvo FM and Volvo FMX.

The Volvo FMX is extremely robust and ideal for construction and mining. The new model is equipped with innovative solutions, such as the VDS system and an air suspension, optimised for construction use, which make it easier to drive, even under tough conditions.

The Volvo FM is specifically designed for the urban environment and regional long haul, and thereby meeting Asia’s fast-paced urbanisation. It is a highly versatile truck that can be tailored for each specific need of the customer’s business.

Enquiry: yannick.otr@volvo.com
The new Herrenknecht raise boring rig is designed for the construction of shafts in hard rock at depths of up to 2,000 m. The Herrenknecht RBR has been designed in such a way that allows quick installation of spare parts and flexible adjustments of its performance: all rig types have a powerful and highly efficient centre-free drive. Multiple identical motor gear units are arranged around the centre of the drive, so that even if one of the motors fails, work can continue with reduced power without interruption. This drive system also allows additional equipping with more motors. For example, a standard RBR600VF can subsequently have an additional fourth motor retrofitted. The total drive power and the available torque are consequently increased, so that the rig can be used for larger shafts and drill rod diameters.

Effectiveness and precision reduce wear and thus prolonging service life. The frequency converter controlled drive concept used in Herrenknecht tunnel boring machines means energy consumption is lower, and the electric motors can achieve significantly higher efficiency compared to hydraulically powered machines, explained Herrenknecht. Variable speed and torque control also allows the precise transmission of power to the drill string; this increases the efficiency of the drilling operation without risking overloading of the individual drill pipes. With heavy drill rods in particular, the innovative active float concept designed by Herrenknecht can also reduce the load on threaded connections when screwing and unscrewing. Lifting the floating box by means of a hydraulic cylinder reduces wear and extends the life of the drill rods. Furthermore, all Herrenknecht rigs are characterised by a compact and modular design. Transport of the rigs can be by road with trucks without special transports and by ship in standard sea containers.

The new raise boring rig (RBR) from Herrenknecht is designed for the construction of shafts in hard rock at depths of up to 2,000 m. It includes four models - RBR300VF, RBR400VF, RBR600VF and RBR900VF - with power ratings between 300 and 800 kW and thrust forces between 458 and 2,243 t.

Reaming shafts with RBRs is safer, less labour intensive and more cost effective than conventional shaft sinking, which was previously the only possible method beyond 1,200 m, said Herrenknecht. With its compact design, the RBR offers high flexibility even in confined spaces. It creates shafts for the transport of muck or ore, haulage shafts, pressure shafts for hydropower plants and supply shafts for energy, water and air.

Initially the rig is installed above the collaring point with the crawler unit or a crane. It drills the pilot hole downwards vertically or at an angle of up to 45 degrees with the drill bit. Depending on the drilling depth, further drill rods are installed progressively, until the target in an already existing tunnel or cavern is reached. The pilot hole drill bit is then removed in the cavern and the reaming head (or reamer) is connected to the drill string. After completion of the assembly work, the rig pulls the reaming head equipped with cutters upwards against the face.

The rotation of the drive unit is transferred via the drill string to the cutterhead, which in combination with the contact pressure of the cutters crushes the rock. The material falls down and can be easily removed. In this way, the entire shaft is reamed upwards to the required diameter.

Drilling shafts up to 2,000 m with large diameters of up to 8 m requires rigs with a high torque capacity and high thrust force. This can be done using the RBR900VF with a torque of 900 kNm and thrust of 2,243 t, developed by Herrenknecht in cooperation with Australian mining contractor Macmahon. The RBR900VF is also equipped with the automated drill pipe feeder developed by Herrenknecht. Compared with manual handling, the remote controlled system ensures both efficient workflows as well as significantly greater work safety for the personnel during installation and removal of the drill string.

The Herrenknecht RBR has been designed in such a way that allows quick installation of spare parts and flexible adjustments of its performance: all rig types have a powerful and highly efficient centre-free drive. Multiple identical motor gear units are arranged around the centre of the drive, so that even if one of the motors fails, work can continue with reduced power without interruption. This drive system also allows additional equipping with more motors. For example, a standard RBR600VF can subsequently have an additional fourth motor retrofitted. The total drive power and the available torque are consequently increased, so that the rig can be used for larger shafts and drill rod diameters.

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New Betek TungStuds and foundation drilling bits

Betek TungStuds offer optimum protection against wear for all digging and excavation work. Fitted with a tungsten carbide core, the TungStuds are the first to come into contact with the excavated material and are exposed to extreme abrasion. The material packed between them is also used as a buffer. This reduces direct wear on the metal surfaces caused by material movements. Instead of expensive spare parts being required due to worn metal surfaces, it is just the TungStuds that have to be replaced.

The use of Betek TungStuds results in lower maintenance costs, as their tungsten carbide core can withstand the most extreme conditions, claimed Betek. A Betek TungStud can be welded on in less than a second. The ceramic ferrule protects the weld pool and is removed after the TungStud has been welded on.

Betek has also unveiled its new generation of round shank cutter bits for foundation drilling applications. The new BKH47P, used on drilling equipment, is suitable for very hard and abrasive soils. The round shank cutter bit is equipped with an enhanced Betek anti-wear hard facing for optimum protection against wear on the tools' steel body.

According to Betek, the BKH47P has already proved its qualities in numerous field tests and the users confirmed that its average lifetime is up to four times longer compared to conventional tools. Even in the most difficult drilling conditions, the Betek tungsten carbide elements are very durable, said Betek.

Betek will be participating in Bauma China in November (Hall N1, German Pavilion 554).

Arrow 750 XL slipform kerber

Arrow Machinery has launched its new 750 XL slipform kerber. The machine is powered by a Yanmar three-cylinder water cooled diesel engine and has a speed of up to 15.5 m/min.

The 750 XL is fitted with the Moba MPA-100 sensing system. This integrated digital control system for all functions gives the operator more flexibility with press button control and digital display fault finding. The machine is 3,690 mm long, 2,300 mm (offset) wide and 1,500 mm high, with a gross weight of 3.78 t.

The 750 XL is also designed to be operator and service friendly. Arrow said the machine's console is clear and concise, allowing the operator to concentrate on the finished kerb.

The new Arrow 750 XL slipform kerber is powered by a Yanmar diesel engine and fitted with a Moba sensing system.
The new Terex Boom Booster kit for the Terex CC 8800-1 crawler crane boosts performance to new heights, particularly when working with steep and long boom configurations. The kit is ideal for heavy lifting applications with long-boom configurations such as petrochemical, wind turbine erection and power plant installation. According to Terex Cranes, the Boom Booster can increase the CC 8800-1 crane’s lift capacity by up to 90 percent, enabling it to outlift any crane within the 1,000 to 2,000 t capacity range and 3,000 t capacity range cranes under certain conditions. The Boom Booster is available with new crane purchases or can be easily retrofitted to existing models.

The Boom Booster kit offers up to 72 m of lift-enhancing boom structure for the CC 8800-1 crawler crane. The wedge-shaped, 11 m long lower and upper adapters flare out to a 10 m width, nearly three times the standard 3.5 m boom width, to enhance the system’s structural integrity. Five 10 m long intermediate segments offer the ability to meet up to 50 m length needs.

Designed for quick, cost-effective transportation, the Boom Booster can be disassembled and shipped in standard 12.2 m open-top containers. In markets that limit container gross weight to 28 t, each intermediate section fits into one container, while the upper/lower adapters ship in two containers, for a total of nine truckloads to transport the entire 72 m boom length. Where up to 40 t containers can be used, only seven truckloads are required to transport the full Boom Booster kit to a job site.

The Terex Boom Booster kit features a pin connection design that eliminates bolts and facilitates faster and simpler boom assembly in the field. Boom sections can be shipped to the job site partially assembled to further advance assembly speed. Both intermediate and adapter sections incorporate the Terex Fall Protection System and walkway to enhance safety when working at height during assembly.

Enquiry: anne.steeb@terex.com

The new Terex Boom Booster kit can increase the CC 8800-1 crane’s lift capacity by up to 90 percent.
Tsurumi introduces LH4110W

Tsurumi’s new LH4110W submersible construction dewatering pump is a three-phase cast iron, two-stage (dual impellers) drainage pump suitable for extra high head pumping. It has a discharge connection of JIS 20K 100 mm flange, motor output of 110 kW and maximum capacity of 2 cu m/min. Its starting method is star-delta.

The LH4110W is capable of extreme high head pumping with a maximum pumping head of 216 m (50 Hz) and 230 m (60 Hz). Being cylindrical and slim, it can be installed in a well casing for deepwell dewatering. The top discharge, flow-thru design provides maximum motor cooling efficiency allowing continuous operation at low water levels and extended dry-run capability. This pump incorporates a seal pressure relief port that prevents the pumping pressure from applying to the shaft seal and has a back-to-back impeller arrangement, which reduces the axial thrust. Other features like cathodic protection anode, high-chromium iron impeller, 420 stainless steel shaft and SiC mechanical seal are common to all LH series pumps.

The LH4110W can be used in various applications such as dewatering in quarry or mining, pumping underground water, storm water, river water and intake of raw water from a remote river or lake.

Enquiry: sales@tsurumipump.com.sg

Husqvarna’s new DC 6000

Strengthening its position within the floor preparation segment, Husqvarna has introduced its new DC 6000 dust collector, which matches the Husqvarna PG 820 and PG 680 dual drive grinding machines.

The DC 6000 is set to replace Husqvarna DC 5500, a vacuum cleaner with a traditional two-filter system. Featuring the double shell cyclone technology with automatic filter cleaning, the DC 6000 provides a number of new benefits. The centrifugal force in the double shell cyclones separates 95 percent of the dust from the intake air. The dust is then collected in a Longopac system. The durability and reliability of Longopac allows fast, drop-down, dust free, disposal into individually sealed plastic bags.

The air continues into the filter cylinder, where the filter catches the remaining dust. In addition, compressed air is used to always keep the filter clean and effective. The purging cycle is computerised for optimum filter cleaning, which results in a productive dust collector with no lost in suction over time.

The DC 6000 is developed with a HEPA 13 filter rating. This rating is often a requirement on job sites in the industry, said Husqvarna. It is a certified filter that meets global health environment standards. And for easy transport, the DC 6000 can also be lowered 28 cm in order to fit in vehicles.

Enquiry: sales.asia@husqvarna.cn

Featuring the double shell cyclone technology with automatic filter cleaning, the Husqvarna DC 6000 provides a number of new benefits.
Manitowoc unveils new Potain flat top cranes for Asia

To help contractors meet the challenges of modern construction sites, Manitowoc Cranes has developed two new flat top tower cranes - the Potain MCT 205 and MCT 85. They are ideal for the Asian market and will be introduced at Bauma China in November.

The larger of the two new cranes is the MCT 205, which has a 10 t maximum capacity and can lift 1.75 t at its maximum jib end of 65 m. With a focus on speedy assembly, the complete upperworks for the MCT 205 can be assembled in four lifts and the heaviest package of elements is just 7.9 t. The full 65 m jib can be lifted in a single go. Attention has been paid to transportation too, with three jib sections capable of fitting inside a single standard container.

Customers can choose from two cab options for the crane, the newer Smartview cab, or the older, established, Vision cab. The Smartview cab has its control panel located outside the cab, providing a quieter working environment for the crane operator. For the Vision Cab, the control panel is situated inside the cab.

There is also a choice for mast sections, with the crane able to reach a freestanding height of 39 m when mounted on 1.6 m mast sections, or a freestanding height of 64.5 m when mounted on the wider 2 m mast sections.

The growing trend for positioning cranes internally within buildings as they are under construction means Potain is offering a configuration for assembling the crane this way. So in its internal floor climbing configuration the MCT 205 can reach a maximum height under hook of 44 m on 1.6 m mast sections or 53 m on 2 m mast sections.

Two hoists are available for the MCT 205, the standard 60 LVF 25, a 45 kW rated hoist that can lift a 2.5 t load at speeds of up to 88 m/min; or the more powerful 75 LVF 25 Optima, a 55 kW rated hoist that can lift the same 2.5 t load at speeds of up to 95 m/min.

Rope capacity on the 75 KVF 25 Optima is also bigger, with 895 m available versus the 550 m available on the 60 LVF 25.

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

Again, on-site assembly is easier thanks to much of the pre-assembly work being taken care of at the factory before the crane is delivered to the customer. For example, the counterjib and towerhead are fitted together as a single component and can be lifted as such. Connecting the jib, meanwhile, is made faster through the use of a very simple and rapid pin-connectors. This means the whole of the tower crane’s upperworks is connected in just two sections.

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

Both the new MCT 205 and MCT 85 are manufactured at Manitowoc’s Zhangjiagang factory in China, where the company builds a full range of Potain tower cranes for Asian and other markets. Manitowoc is expecting the first units to be on site just a few months after Bauma China. Testing has been comprehensive and has proven successful thus far, said the company.

Enquiry: punitha.govindasamy@manitowoc.com
The hoppt DVR16 ride-on vibratory roller features two vibratory modes – the front and dual-drum drive. The machine has a good wall clearance, which makes it ideal for use near obstacles as well as in hard-to-manoeuvre areas.

The DVR16 is powered by a Kubota D1105 three-cylinder liquid-cooled naturally aspirated diesel engine that complies with EPA Tier 4/EU Stage III A emission regulations. The DVR16 is also fitted with Eaton valves and cylinders for excellent performance; Casappa hydraulic vibration motor system for low-noise emissions, exceptional long working life and energy savings; and Poclain axial piston pumps and motor (PMVO) with variable displacement.

The DVR16 is 2,095 mm long by 2,568 mm high by 980 mm wide, with a top-of-steering-wheel height of 1,534 mm. The machine is ergonomically designed to ensure operator comfort. It has a clearly laid-out operating panel configuration for easy operation, and its engine and components can be easily accessed and maintained from the operator’s floor board.

In addition, the DVR16 features a weight of 1,620 kg (operating) and 1,680 kg (shipping); static drum weight of 740 kg (front) and 835 kg (rear); drum (chamfered-edge finishing) of 900 mm in width (option of 1,000 mm), 560 mm in diameter, 13 mm in shell thickness, and clearance of 40 mm (side) and 337 mm (kerb); spring-loaded, self-adjusting steel drum wiper; vibration of 66.7 Hz and nominal amplitude of 0.4; centrifugal force of 16 kN; highest propulsion speed of 10 km/h; gradeability of 35 percent, with spring applied hydraulically released (SAHR) parking; outside turning radius of 3,100 mm, with a maintenance-free centre pivot articulation of ±30°; water system of pressurised electric diaphragm pump with filters of 100 mesh screen at nozzle with 80 mesh in-line; and tank capacity of 110 l (water), 31 l (fuel) and 30 l (hydraulic).

The DVR16 has been used by customers all over the world, including those in Australia, Europe, Namibia and South Africa, among others.

The hoppt HRT888 ride-on power trowel is suitable for seasoned professionals and entry-level operators. It is the latest addition to the hoppt range of power trowels for finishing and panning jobs.

The HRT888 is powered by a Kubota V1505-T @ 33 kW turbo-charged vertical four-cycle liquid-cooled diesel engine.

Other features of the HRT888 include generation III hydraulic joystick power steering for smooth manoeuvrability; super heavy-duty gearbox driving a five-bladed rotor; (standard) electric-powered retardant spray system, built-in cup holder, six halogen lights (front and rear) and lifting bridle for loading and unloading; raised platform and foot pedals for operator comfort and productivity; cruise control and foot pedal controlled safety shutdown switch; light switch, key switch, 12 V charger (for mobile electronic devices) and tachometer - all in one convenient location; removable front panel with quick-release rubber latches for easy access and maintenance of the engine; and (optional) pair of dolly jack wheels and lifting bridle for easy transportation.

The HRT888 features 2,578 mm long by 1,280 mm wide by 1,508 mm high, with an operating weight of 657 kg, panning path width of 2,413 mm, five-bladed spider rotor diameter of 1,168 mm at a maximum 140 rpm, and fuel/retardant tank capacity of 23 l.
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PMP Industries SpA serves a wide range of businesses globally and delivers total solutions to OEMs in numerous sectors, including construction equipment, material handling, mining, steel, agriculture, forestry and marine, among others. PMP Power Transmission Division, which offers mechanical transmissions and gearboxes, and PMP Fluid Power Division, which designs and manufactures high pressure axial piston pumps and motors, have come together to provide customers with the best solutions of both worlds.

In the concrete industry, PMP manufactures planetary gearboxes for concrete mixer trucks. The company’s PMB gearboxes cover a wide range of applications on mixer trucks and trailers with up to 18 cu m drum capacity. Other solutions for concrete mixer trucks include the PMH P high pressure axial piston pumps and PMH M high pressure axial piston motors. The products are built with premium materials, tight tolerances and high accuracy to guarantee excellent durability and efficiency, explained PMP. The geometry of the components is optimised to reduce wear and provide the most efficient oil flow. Similarly, the global structure of the transmission is designed to handle pressure and loads without deformation - this way efficiency is also maintained in high pressure working conditions, said the company.

PMP will be exhibiting the products at Bauma China in November (indoor stand N5 400). In addition to the PMB and PMH series for concrete mixer trucks, the company will present its solutions for hydraulic excavators (PMCI and PMTE series with the open loop pump and valve monoblock), aerial platforms (PMC and MKF series), forklifts (PMS series) and several other machines.

PMP Industries SpA is the Italian holding company of an international group with five branches (in Bosnia, China, India, USA and Brazil), four business units and 1,000 employees worldwide.

Enquiry: sales.cn@pmp-industries.com

Hydraulic fluid technology to achieve high fuel efficiency

Evonik Industries, one of the world leaders in specialty chemicals, has developed the DYNAVIS technology that is aimed to increase the fuel efficiency and productivity of hydraulic equipment (e.g. excavators, loaders, etc). According to the company, in laboratory tests and field trials, hydraulic fluids formulated to DYNAVIS technology performance standards have achieved fuel savings averaging around five to 10 percent versus a conventional monograde ISO 46 fluid, with some field tests having recorded gains of as high as 30 percent.

The DYNAVIS technology will be shown at Bauma China in November.

Evonik’s oil additives business line has taken a leadership role in developing lubricant additive technology designed to improve fuel efficiency and productivity. Apart from the impressive fuel savings and productivity gains achieved with DYNAVIS technology for hydraulic fluids, energy saving results have also been demonstrated with VISCOPLEX Viscosity Index Improvers (VIIs) in engine oils, driveline fluids and gear oils. Evonik’s VISCOBASE technology offers an ideal balance between a very shear-stable VII and a synthetic base fluid, supporting the high-performance lubrication needs of applications such as Wind Turbine Gear Oil (WTGO). In all of its many applications, Evonik strives for resource efficiency, reducing operating costs as well as CO₂ emissions.

Enquiry: carlos.vernet@evonik.com
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Visit us at www.shantui.com
The Link-Belt RTC-8080 Series II is a rough terrain crane that rounds out the company’s line of mid-range rough terrain cranes. In accordance with EPA Tier 4 Final and EU Stage IV emissions regulations, Link-Belt will now offer both a fully emission compliant power option as well as an export version that remains Tier III. Both versions of the engine are Cummins QSB 6.7L 270 hp.

Notable new features since the RTC-8080 Series II was introduced two years ago include remote controlled high intensity boom floodlight, a standard camera package and aluminium decking. The remote controlled boom floodlight attaches to the end of the telescopic boom base section and can be used as a spotlight in nighttime settings. Camera packages enhance on-board site monitoring and include cameras located on the right side of the upper frame as well as a winch camera, mounted between the two winches on the upper.

The RTC-8080 Series II comes with a full-power, 12.5 to 38.7 m four section boom with market leading capacity for its class. The crane also features the extend system that incorporates the two mode telescope proportioning system known as A-max and standard for optimum strength and stability charts. To make maintenance easier, the design incorporates Link-Belt’s standard Teflon wear pucks impregnated in the wear pad surfaces so the boom requires no grease.

There are three on-board fly options available that feature four manual offset positions of 2, 15, 30 and 45 degrees. One of the three on-board fly offerings is the three-piece, bi-fold lattice fly, which features a 3 m integrated fly that was first introduced on the RTC-80130 Series II and HTC-3140LB cranes.

The carrier of the RTC-8080 is a box-type construction, torsion resistant, with a welded construction made of high tensile steel. The frame is equipped with front and rear towing and tie-down lugs, tow connections and access ladders. The RTC-8080 Series II was able to meet all Tier 4f requirements and still maintain six points of access to the flat carrier deck. Front and rear lower steps can be folded to avoid damage during transport.

Once on deck, routine checks on powertrain components and fluid levels are a snap with large swing-out doors that reveal the entire engine compartment. There is also an access ladder incorporated into upper sheet metal allowing access to an upper work platform with a folding guardrail.

The operator’s cab features a large viewing window that minimises blind spots and has well placed controls and readouts, including Link-Belt’s Pulse. Link-Belt Pulse is an in-house designed, total crane operating system that utilises an in-cab display as a readout and operator interface for over 20 different crane diagnostics including the rated capacity limiter, wind speed, boom length and angle, radius of load and crane configuration, just to name a few.

Other highlights of the RTC-8080 Series II - and all Link-Belt Series II cranes - include the Confined Area Lifting Capacity (CALC) feature, which allows for three different outrigger positions (fully extended, intermediate and fully retracted); electronic throttle for improved throttle response; hydraulic disc brakes for both service brakes and parking brake; single or dual axis joystick controls for smooth, precise control; weather proof electrical connectors and relays throughout for outstanding long-term reliability; colour coded and numbered wiring that is protected by a flame retardant polyethylene insulation; full lighting package including cab lights, headlights, turn indication, marker, backup and stop; powder-coated tubing utilised throughout the crane; hand-held outrigger controls; pre-painted components and plated hardware; and O-ring face sealed hydraulic components with staggered fittings.
Construction of boreholes by the uncased kelly drilling technique with extensive drilling depths or large drilling diameters is said to be the dominant process in many markets. For this specific application, Bauer has developed a new drilling rig series - the BG ValueLine. The BG 26 represents the company’s best-selling medium sized machine, while the BG 38 is a high capacity kelly drilling machine with excellent features such as a maximum drilling depth of 90 m and maximum drilling diameter of 3 m.

Bauer also offers diaphragm walling equipment. Two of its GB base carrier systems for hydraulic grabs include the GB 46, which is the company’s best-selling standard model, and the GB 60, believed to be the largest machine on the diaphragm wall market with a depth capacity of 90 m. The grabs are equipped with special features, such as a turning device and a flap steering system for maintaining verticality. For operator comfort, a new Bauer operator cabin is fitted with the latest B-Tronic screen and updated software.

Bauer will be showcasing the products at Bauma China in November (outdoor stand A06/A13). Enquiry: bma@bauer.de
Haulotte 4527A trailer-mounted boom lift

The Haulotte 4527A articulating boom lift offers a maximum working height of 51 ft and maximum outreach of 27 ft, with an up-and-over height of 20 ft 9 in. The automatic, self-levelling hydraulic outrigger system allows setup and operation in less than 30 seconds when all four outriggers are deployed simultaneously, said Haulotte.

The extra-large, non-marking outrigger footpads make these units ideal for indoor and outdoor applications. The controls on the ground and on the platform have the same, simple to understand layout and push button design, so there is little operator learning curve; making them excellent for one-time customers or contractors who have multiple employees.

The trailer-mounted booms have many advantages over other traditional aerial and scissor lifts because they provide more versatility, are easier to transport and offer the most reach for the least cost, explained Haulotte. They are perfect for building construction and repair, tree trimming, sign installation/repair, painting tall buildings/structures and installing holiday lights and decorations.

Enquiry: haulotteasia@haulotte.com

Ammann’s powerful add-on compactor

The Ammann ACA 250 is an add-on compactor specifically for mini excavators. It features a working weight of 180 kg and centrifugal force of 20 kN. Standardised, fast-action coupling for any mini excavator and a simple operating concept enable this small compactor to be ready for immediate and efficient use in tight working conditions, for backfilling buildings or for working on inclines and in trenches. A simple swivel mechanism makes it possible to rotate the compactor to the ideal working position.

Ammann said the company is the first and only supplier to incorporate a tried and tested twin-shaft exciter in vibratory plates in the add-on compactor. It generates a vertically directed compaction output that guarantees maximum compaction energy transmission into the ground, whilst eliminating the vibrations that single-shaft exciters transfer to the excavator's boom. The ACA 250 is specifically designed for use on mini excavators weighing 2 t or more and on backhoe loaders.

Enquiry: info.aid@ammann-group.com

The ACA 250 is an add-on compactor designed specifically for mini excavators, with a working weight of 180 kg and centrifugal force of 20 kN. Ammann is believed to be the first and only supplier to incorporate a tried and tested twin-shaft exciter in vibratory plates in the add-on compactor.
LiuGong launches wheel loaders for Indonesian market

LiuGong has launched two wheel loaders for the Indonesian market, the 836 and 855. PT Panca Traktor, LiuGong’s authorised dealer, offers these two machines in response to the requests of Indonesian customers for compact, simple-to-use, easily maintained and economically priced, mid-size wheel loaders.

The 836 is a compact wheel loader designed to work in tight and confined spaces. The machine was first launched in China in 2005. The 855 is a mid-size wheel loader, which was first launched in China in 2009. It is now equipped with the new Cummins L9.3 engine providing higher productivity, excellent reliability and better fuel consumption.

These wheel loaders have a strong breakout force and high dump clearance, which make them ideal for multiple applications, like re-handling, construction, and quarrying in agricultural and aggregate industries. Moreover, both machines feature low fuel consumption, minimal operating costs, operator comfort and easy servicing.

The 836 and 855 wheel loaders, along with the LiuGong 920D excavator and 610H roller, were recently exhibited at Indonesia’s Surabaya JX Expo. It was the first roadshow organised by PT Panca Traktor, which has opened a branch office in Surabaya. The company’s other offices are located in Jakarta, Palembang and Pekanbaru.

Enquiry: lgap@liugong.com
FAE offers DDTR series casing rotator

The DDTR series casing rotator from Foundation Associates Engineering (FAE) is able to drive in the casing through rotation as well as perform with the aid of a rotary drill. The casing rotator can be used in various jobs including foundation piles (for houses, bridges, roads, building of subway platforms, and water retaining wall of a reservoir reinforcement); clearing underground obstructions (in urban construction, the DDTR series can cut through steel reinforced piles, steel pipe piles, H steel piles, pc piles and wood piles); and cutting the rock stratum (e.g. drilling through holes in the bed rocks to form concrete piles).

The DDTR series has a wedge clamping device. It can clamp casing in any position as compared to the traditional clamps, and the larger drawing resistance causes greater clamp force, said FAE. In addition, the auxiliary clamping device further provides verticality of the casing during the job.

The four sets of motor reducers are used to transfer the rotary torque to the casing to overcome the complicated stratum and obstacles. The work travelling device allows the DDTR series to have the option of incorporating a track system that can make the equipment more mobile around the job sites.

The DDTR casing rotator’s power pack has several advantageous features. Depending on the job requirements, the power pack’s operating system can keep the machine running at optimum working state by adjusting the speed, torque and pressing force. The power pack has a cutter head load automatic control system - in the event of cutting through hard rock, utilising an automatic control will not only increase the efficiency of cutting process, but also protect the cutter head.

The main function of the control system is located in the power pack, so if there is any malfunctions, the emergency system can be used to end the job. With the instant enhancement system, it is also possible to increase the torque and pulling force to clear obstructions. Furthermore, the optional power pack travelling device ensures stability and safety during working period.

FAE’s DDTR series features maximum casing diameters of up to 2,600 mm. The casing rotator can be combined with the power pack producing up to 441 kW.

Enquiry: fnapl@singnet.com.sg

Fujian Haiyuan’s hydraulic press and AAC machines


The HF series automatic hydraulic autoclaved brick press machine features high utilisation of waste materials, high brick intensity (can reach above 20 MPa, said the company), high production capacity and automation. The waste materials - which are used as raw materials for bricks - include fly ash, mill tailings, desulfurated ash, furnace slag, mining slag, stone waste, carbide slag and phosphogypsum. The machine can produce various types of bricks such as solid bricks, hollow bricks, multi-hole bricks, blind-hole bricks and pavement bricks.

The Haiyuan AAC machine uses siliceous materials (fly ash or silica sand, river sand, mountain sand, tail mineral and shale) as the main raw materials and adds a suitable amount of calcium materials such as lime, cement, gypsum and aluminium powder. The company said AAC bricks are excellent due to their lightweight, high strength, durability, waterproof ability, high efficiency and low energy consumption, among other things.

Enquiry: sales@haiyuan-group.com

A DDTR series casing rotator at a job site in Hong Kong.

Haiyuan’s HF series automatic hydraulic autoclaved brick press machine (above) and ACC machine.
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HOBAS overflow systems for combined sewers and storage systems

The collection and discharge of storm and wastewater represents a daily challenge for wastewater facilities and municipalities. In combined systems, domestic, commercial, and industrial sewage and stormwater are all transported to the wastewater treatment plant by one shared sewer. Due to an increase in heavy rain events, sewers are frequently surcharged and wastewater treatment plants could reach their capacity limit. For the system to operate flawlessly even at peak times, stormwater retention basins are installed at suitable points. In combination with overflow structures, they regulate the water quantity to be led to the wastewater treatment plant. The retention basins serve as temporary storage from which the wastewater is gradually discharged.

HOBAS offers two alternatives to conventional retention basins, which include the HOBAS CSO (Combined Sewer Overflow) Chamber, a modular overflow system for combined sewers with low-maintenance solids separation, and GRP storage systems.

In cooperation with the CVUT University Prague and in compliance with the EU Water Framework Directive 2000/60/EC, HOBAS developed a particularly efficient GRP overflow system for combined sewers: the HOBAS CSO Chamber separates solids from liquid very efficiently and directs them to the wastewater treatment plant, while the cleaned part of the water is discharged into the receiving water course.

Every single HOBAS CSO Chamber is made to measure. According to the company, compared to conventional sewer overflow systems, the HOBAS CSO Chamber provides numerous advantages: its cleaning performance is much better even at low flow rates, production time is very short, installation quick and easy, operation problem-free, the unit requires only little space and excavation – and not least, it helps protect the environment considerably.

The first HOBAS CSO Chamber was installed in 2007. Up to now, several projects have been carried out in Slovakia and the Czech Republic. The first HOBAS CSO Chamber in Germany was implemented in Thuringia in the second quarter of 2013. The products’ numerous advantages convinced the client and the designer – instead of the originally planned concrete structure, they opted for the new HOBAS technology. Apart from the CSO Chamber, HOBAS also supplied the pipework as well as the pumping station for the throttled outlet leading to the wastewater treatment plant.

In addition, storage systems are employed when the installation of open retention basins is not possible due to space limitations (e.g. in city centres). Both products operate essentially in the same way: in events of heavy rainfall, the incoming water is first accumulated, then throttled and led into the subsequent sewer system. Leftover deposits of suspended solids in the sewer are washed out with the next rain and conveyed to the wastewater treatment plant. Thanks to the smooth inner surface of HOBAS GRP products, the sewer system is practically self-cleaning and requires hardly any maintenance.

An example for such a storage system is the Heidelsteinstraße project in Fulda, Germany. Since the stormwater and sewage system was overburdened and in urgent need of rehabilitation, a new combined sewer was to be built and connected to a HOBAS GRP storage system DN 3000. The installation of the originally designed concrete structure proved to be too costly, which is why GRP was chosen as an alternative. Apart from the overflow structure, the whole storage system is made of GRP, i.e. even the throttle and connecting structure as well as the intermediate shaft. The 3.5 m difference in height on a length of approximately 8 m represented a particular challenge when connecting the overflow structure to the adjacent stream - but this was not a problem for HOBAS, as the difference in altitude could be easily overcome with a swan-neck bend with 45 degree angle. The completely prefabricated modules were easily installed and connected to the combined sewer. At the beginning of 2013, the construction works were successfully completed.
All-in-one, multi-purpose Insero AMP

The highlight in Insero Equipment’s line up of innovative products is the Insero AMP. This all-in-one, multi-purpose machine is equipped with separate hydraulic, pneumatic and electric power sources atop a proven construction equipment base. The machine is capable of handling multiple tools simultaneously via its 8.5 kW generator, 0.3-0.6 LPS independent hydraulic system and 2.4 cu m/min air compressor.

Insero Equipment’s product line is geared towards demanding construction applications and the strong requirements of the rental industry, increasing jobsite efficiency over the short-, medium- and long-term. The company plans to expand into the Chinese and Asian market, and will be joining Bauma China in November at the USA Pavilion.

Enquiry: info@inseroequipment.com

The Insero AMP is capable of handling multiple tools simultaneously.
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Super Crush Mode

THE FIVE CONSTRUCTION PRINCIPLES

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<tr>
<th>Principle</th>
<th>Description</th>
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<td>Environmental Protection</td>
<td>Construction work should be environmentally friendly and free from pollution.</td>
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<tr>
<td>Safety</td>
<td>Construction work has to be carried out in safety and comfort with a method implementing the highest safety criteria.</td>
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<tr>
<td>Speed</td>
<td>Construction work should be completed in the shortest possible period of time.</td>
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<tr>
<td>Economy</td>
<td>Construction work must be done rationally with an inventive mind to overcome all constraints at the lowest cost.</td>
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<tr>
<td>Aesthetics</td>
<td>Construction work must proceed smoothly and the finished product should portray cultural and artistic flavour.</td>
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Giken Silent Piler Leads South-East Asian Construction Industry

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An Enerpac EVO synchronous lifting system has been deployed by Sync Lift Systems Ltd to safely raise, re-level and restore for occupancy an entire 2,800 t, 70 m long, three-storey concrete building in Fitzgerald Avenue, Christchurch, New Zealand, which sank up to 300 mm during the devastating earthquake of 2011. The shallow 6.3 (ML) magnitude earthquake killed 185 people and caused extensive damage that was exacerbated by buildings and infrastructure already weakened by the September 2010 7.1 (ML) earthquake and its aftershocks.

The Enerpac synchronous lifting system deployed was of a type that replaces manual control of hydraulic heavy lifting with programmable logic control (PLC) of multiple cylinder lifts, a technology that offers accuracy, safety and productivity benefits for precision lifting of heavy machinery, plant and structures.

Using the EVO system, one operator controls the entire precision lifting process, during which the status of every lifting point is constantly monitored and displayed. Instead of whole teams of lifting personnel trying to manually co-ordinate with each other lifts by hydraulic cylinders dispersed around a job, the EVO-series synchronous lifting system integrates the high-pressure hydraulic cylinders involved with the PLC system to monitor and control precise movement and positioning of heavy loads. Through an integrated human machine interface (HMI), all movements are managed from a central control position that displays live operation with real-time status updates for each lifting position.

According to Sync Lift Systems, the company had to restrict flexing of the building to a range within 4 mm a metre – or a total of 24 mm over jacking points spread 6 m apart. The lift was staged progressively from one end of the building to the other, with first one end, then the middle, then the other end lifted by increments to optimise accuracy and minimise deflection. The process was repeated to raise the building to the required position.

Twenty-two 100- and 150-t Enerpac 10,000 psi cylinders were installed on steel stools and connected to the building’s foundation.

Some cylinders were connected together and operated as one from one outlet of the system. These combined cylinders were synchronised on the signal coming from the single stroke sensor connected to them. All hydraulic lift cylinders were connected to the EVO’s pump unit via hydraulic hoses connected.

To correctly manage the cylinder forces, the lift stools were levelled to provide the correct reaction. The lift crew attached draw-wire stroke sensors to each of the lifting positions. The EVO system uses displacement information measured by the stroke sensors to maintain a synchronous accuracy over all positions of less than 1 mm. The operators then entered synchronous accuracy, maximum and pre-load control parameters into the system, specific to the lifting operation.

The synchronous lifting system controlled the extension of the cylinders to safely and accurately lift the foundation and the building to the required position. Once the foundation was lifted to the correct position, the lock nuts were fastened and the foundation and building was fixed in required position.

The entire project was completed within 21 days. Reoccupation of the building commenced shortly afterwards. In addition to buildings and stadiums, the EVO system can be readily applied to infrastructure such as bridges and tunnels and for monitoring, foundation support and structural testing.

Enquiry: salesasia@enerpac.com
Sennebogen has delivered a 683 R-HD telescopic crawler crane to Guan Chuan Engineering & Construction Pte Ltd in Singapore. The machine was supplied at the beginning of 2014 by Sennebogen’s local sales and service partner, Aly Energy, and is being used for sheet pile wall construction.

Guan Chuan specialises in demanding sheet pile wall installations and foundation works. The company is capable of driving in sheet pile walls under difficult conditions, such as hard rock or areas that are sensitive to vibration. It uses a so-called crush piler that is mounted in suspension on a Sennebogen 683 telescopic crawler crane. The work associated with this type of pile wall construction is the simultaneous drilling out of the substrate via an auger drill and driving in of the pile walls. Thus even the most difficult ground conditions can be overcome, and the method is certainly quiet and free of vibration as compared with conventional vibrators, said Sennebogen.

Featuring a robust Starlifter undercarriage with a 4.40 m track width, the 683 R-HD is not only very stable but also can be conveniently moved and promptly converted even under load. As such, the machine remains flexible even in confined spaces. The 683 R-HD is powered by a 186 kW diesel engine, and its 42 m long boom can be variably telescoped. According to Sennebogen, the crane can be ready for operation in a few minutes, and it can also be quickly retracted due to wind and weather. The solid structural steelwork safely absorbs major vibration, and safe working loads to 80 t are ensured. The Maxcab, which can be tilted 20 degrees, offers the operator an ideal overview and high level of work safety.

Apart from the 683 R-HD, Guan Chuan also uses two smaller Sennebogen telescopic cranes, the 613 R and 653 R.

Guan Chuan relies on Sennebogen for pile wall installations.

Enquiry: burgmer.m@sennebogenpl.com

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Top right and above: Guan Chuan uses a Sennebogen 683 R-HD telescopic crawler crane for demanding pile wall applications.
Stanley MacAdam Company was recently contracted to complete paving work for a car park near the Brisbane Airport in Australia. The project required a complex design with a grade that varied from +2 to -2 percent horizontally every 20 m and from +2 to -2 percent longitudinally every 30 m. The new parking area is roughly 50,000 sq m. The company was faced with meeting tight tolerances (+/- 10 mm); the design was further complicated by using a new dense recycled material as the road base.

To solve this problem, Stanley MacAdam selected the Dynapac SD2500CS paver with a high compaction screed. And with the help of its local Trimble dealer, SITECH Construction Systems, the company chose the Trimble PCS900 paving control system to complete the project.

The traditional paver is designed to pave long smooth roads such as a highway or airport runways, however, with this more complex design the screed of the paver has to react very accurately over a shorter distance. This is where a smarter paving solution by using the 3D Trimble PCS900 paving control system was very beneficial.

The Trimble paving system installed on the paver consisted of a Trimble SPS930 universal total station, an MT900 active target, and a CB460 display running the PCS900 on-board software. The PCS900 system connects to the paver’s hydraulics and used the highly accurate total station and target positioning to precisely control the screed’s position.

Stanley MacAdam used two pavers in total on the project; the paver with the high compaction screed equipped with the Trimble PCS900 system was used to place the two layers of dense recycled road base, each around 150 mm thick, while the other paver followed placing 25 mm of a DG10MG asphalt layer.

The most technologically advanced high compaction paver with the Trimble paving system allowed operators to meet design requirements and achieve paving precision in record time. The paving system displays the measured and target values of the cross slope and pavement thickness simultaneously on the control box. Following the indicators, Stanley MacAdam achieved 4 mm tolerance on the final road base layer. Meeting this tolerance was critical for ensuring water flowed properly to drainage pits. These results were achieved even in the presence of poor subgrade levels (which varied from 43 mm high to 77 mm low).

According to Stanley MacAdam, without the Trimble system, meeting the design requirements and within the time period allowed would have been next to impossible. This is because with such a variance in grade and depth, only the automatic screed control from the Trimble paving system in conjunction with the high compaction screed could this have been made possible.

Stanley MacAdam said it finished the project on time, even contending with a 16-day rain delay. The placement of the dense recycled material was completed in just two weeks, while another six days was required to place the asphalt layer.

Laying the high density recycled material also proved simple with the Trimble system. The PCS900 system guided operators to pave to variable depths and slopes based on the 3D design. Even contending with high and low spots across the surface, operators reached the 2 percent grade in accordance with the design criteria more quickly. In essence, the system’s uncompacted surface designs guided the paver to automatically lay more material above low areas and less material in high areas, anticipating and eliminating waves that can occur after asphalt compaction.

Automatic control of the screed gave operators the ability to achieve design levels earlier in the process while using the less expensive road base material. This is in stark contrast to conventional methods that often require re-working of the pavement to achieve design levels prior to the placement of the asphalt layer, i.e. asphalts are generally used as a corrector layer at this stage, thus making financial sense, as the asphalt layer can be up to eight times more expensive than other layers. In this car park project, Stanley MacAdam managed to maintain a 25 mm asphalt layer, with no overspills, which kept project costs down significantly.

Enquiry: construction_news@trimble.com
Volvo helps build Shillong bypass

Shillong is the capital of Meghalaya, one of the smallest states in India. It is located 1,496 m above sea level, with the highest point being Shillong Peak at almost 2,000 m. The Shillong bypass was built to connect the top of the main NH-40 highway starting at Umiam in Ri-Bhoi district to the bottom of the NH-44 highway at Mawryngknend in the East Khasi Hills district. It included building about 500 km of road for two-lane traffic as well as a 2.5 m shoulder on each side. The National Highway Authority of India (NHAI) awarded the project to Shillong Expressway, which then contracted out the work to GR Infraprojects Ltd.

The total project cost an estimated 2,510 million Rupees and was completed in the first quarter of this year, two years after the project began in 2011. The work was finished before its scheduled completion date and has raised the expectation of more road construction in the region. Two major high level steel girder bridges were also constructed – 45 m long and 30 m high – as well as five minor bridges, an underpass, four bypasses, two major junctions, 64 small junctions and seven bus bays.

GR Infraprojects used Volvo Construction Equipment’s hydraulic excavators throughout the project, including five 14 t class EC140BLC and two 20 t EC210B-series models to dig and remove overburden. Because of the mountainous terrain, a lot of cut and fill was required, resulting in a huge amount of earthmoving in order to keep to schedule. For day-to-day operations the company also used other Volvo machines including four DD100 double drum asphalt compactors, two SD110 soil compactors, 0930 motor graders, L120 wheel loaders and an ABG7820 asphalt paver.

Enquiry: mats.edenborg@volvo.com
A new business and residential district is being built in Milan, Italy, as part of the CityLife-Project. At its centre is a building that sets innovative standards, Torre Isozaki, which focuses on sustainability and serves as a symbol for the green approach of the entire CityLife-Project. It is a purely pedestrian precinct that produces zero emissions. The tower is designed for maximum efficiency and located on a 170,000 sq m area in the spacious public CityLife-Park. With a 202 m height and 53 storeys (including basement levels), 46 of which occupied by office space, Torre Isozaki offers an overall area of 53,000 sq m and therefore space for up to 3,800 people. The design for Torre Isozaki was developed by Japanese Architect Arata Isozaki and his Italian colleague Andrea Maffei.

Colombo Costruzioni SpA chose Doka as formwork technology partner, which supplied automatic climbing formwork and protection screens for this project. The building shell is scheduled to be completed by mid-year 2014, around three months prior to the originally scheduled completion deadline. The construction method developed by Colombo Costruzioni and fully supported by Doka resulted in the ability to reduce planned construction stage cycle times significantly. According to Doka, Torre Isozaki is the first high-rise building in Italy where core floors and walls are realised in the same step rather than the core being built beforehand.

Surface treatment of fair-faced concrete on the exterior shaft walls for panorama lifts presented a particularly difficult challenge for Doka. The panorama lifts built into the exterior walls are arranged between fair-faced concrete areas so as to create a balanced silhouette. While designing the tower, the architect Arata Isozaki placed particular emphasis on the harmonious configuration of continuous facades that were to accentuate the uniform surface symmetry of the building. Integration of the pre-assembled triple bracket, twice angled stairway with intermediate landings constitutes another special feature. For this purpose openings above average size in the self climbing unit’s platform levels had to be accounted for as early as during the design stage. Doka met this special customer request as well. The resulting advantages are easy and quick installation of the pre-assembled stair brackets and the associated optimisation of crane use times.

Formwork is raised hydraulically by way of the SKE100 plus automatic climbing formwork. This lifting technology raises not only the formwork but also the concrete placing boom built into the automatic climbing formwork. Thus the only tasks requiring a crane is lifting the floor formwork and placing the reinforcement steel. Each pouring section is approximately 3.90 m high; the overall cycle time needed for this height amounts to a week on average. The Xclimb 60 protection screen ensures the safety of workers and guarantees constant work progress even in adverse weather. Doka Top 50 large-area formwork also provides an ideal solution for core walls and panorama lift shafts.

Especially challenging in terms of the integrated safety concept were the different shapes of ceiling edges and continuous exterior walls, said Doka. The company developed a specific solution to the problem where work areas and manhole flaps of the protection screens were equipped with variable sealing flaps. This way all openings were safely sealed and the different designs of wall and ceiling edges taken into account.
WA Limestone is a family-owned company that has been operating for over 40 years. It is now one of the largest suppliers of granite armor stone, magnetite, quarry and construction aggregates, road construction materials and marine infrastructure in Western Australia. As part of its ongoing growth, the company has expanded its fleet of Rammer hammers with the purchase of a new Rammer 4099 through a local dealer Total Rockbreaking Solutions.

The purchase of the 2,800 kg hammer is the latest step in a relationship that stretches back to 2000 when WA Limestone bought its first Rammer hammer, a 3,800 kg Rammer G100. The company used it in a hard rock quarry in Byford that supplies all types of granite products. After 11 years of service in this demanding application, the Rammer G100 was replaced by a Rammer 4099 breaker in 2011.

In the past few years, WA Limestone has expanded its operations with two hard rock quarries being established in Western Australia. Due to the increased demand for specialised rock, another Rammer 4099 was acquired for the Karratha quarry in December 2013.

According to WA Limestone, because of the remote operation, the Rammer sealed accumulator system is far more reliable than the piston accumulators offered by competing breakers that need more frequent maintenance due to charging of the gas system.

Enquiry: satu.ramo@sandvik.com

Rammer ‘rocking’ in Australia quarry

As part of its ongoing growth, WA Limestone has expanded its fleet of Rammer hammers with the purchase of another Rammer 4099 for a hard rock quarry application.
Gomaco paver excels at Sioux Falls airport

The Sioux Falls Regional Airport (FSD) in Sioux Falls, South Dakota, USA, upgraded its runways in 2012. The most difficult portion of the project was said to be the removal and replacement of 228.6 m of the intersection of the two main runways, 3-21 and 15-33. The location of the intersection did not leave enough room on either runway to land commercial airplanes so the airport would be essentially shut down during the intersection reconstruction.

Conventional construction would have the airport closed to commercial air traffic for almost a month - this was not economically plausible. So a different construction approach was developed: a series of four long weekends to rebuild the intersection, two weekends for actual work and an additional two backup weekends in case of inclement weather. The runways would be completely closed down starting at 2 pm on Friday until 8 pm on Monday. One small runway, 9-27, would remain open for general aviation and air ambulance services.

A Sioux Falls-based company, T&R Contracting Inc, won the bid to complete the time-challenged project. Project subcontractors, Soukup Construction and Runge Enterprises, would handle the removal of the existing runway and the base course preparations while T&R Contracting would complete the concrete paving on the project. T&R Contracting’s paver of choice for this project was a Gomaco GP-4000, purchased reconditioned from Godbersen Equipment Company (GEC) in Ida Grove, Iowa.

At 2 pm on Friday (17 August), the airport closed down its runways and demolition work began. Removal of the runways was started right in the centre of the two and worked towards the outer edges. Approximately 1,067 mm in depth of existing runway, subbase and dirt was removed using 30 pieces of equipment and over 80 trucks. New subbase preparations included a layer of geotextile fabric and then 635 mm of P209 crushed aggregate base course.

Six hours after the runways closed, T&R Contracting was ready to slipform its first paving pass with the GP-4000. Each pass was 11.4 m wide and 432 mm thick across each of the 45.7 m wide runways. T&R Contracting also had its Gomaco GHP-2800 slipform paver on site, ready to go, as a precautionary measure in case a second paving train was needed.

The concrete was an airport specified mix design with the ability to reach 3,000 psi within 24 hours. It also needed to set up quickly to allow T&R Contracting to come through and drill holes in the edge of the new runway for sidebars. Slump averaged between 13 and 25 mm. Twenty trucks were used to feed the GP-4000, each one carrying 7.6 cu m loads. No placer/spreader was used; instead two trucks at a time dumped directly onto grade in front of the paver. Production averaged 305.8 cu m per hour.

During the first weekend of paving, T&R Contracting completed four pours and finished one of the 228.6 m long sections of runway by 4 pm Sunday afternoon. Monday morning was spent on hand pours for tie-ins and radii at the intersections. By 8 pm on Monday night, the runways were reopened and commercial plane traffic restarted.

Four days later, on Friday (24 August) T&R was back at the Sioux Falls Airport to finish what it had started. Paving runs would be shorter this weekend, because of the angled runways and the pieces left to pave. The company had to work the GP-4000 over 16 headers and footers on that final weekend.

The two extra weekends as backup would not be needed. Rain was only a factor on the very first and the very last pour of the project.

Otherwise, Mother Nature cooperated with the tight completion deadline. T&R Contracting finished its last slipforming run early on Sunday morning (26 August).

‘Personal’ benefits

One of the biggest Italian producers of expanded polystyrene (EPS) has completed its business of thermal insulation with a series of specific complimentary products using the Origami system from Personal Factory. An advantage of using this system was that the whole process could be carried out quickly including certification, new product development, marketing and technical development, said Personal Factory. Flexibility was another advantage; there is no limits in producing many new products with specific customisations using the Origami system, which is controlled and tracked from Personal Factory’s headquarters.
XCMG XGTT200 towers above Jakarta

An XCMG XGTT200 (6022-12) flat top tower crane has recently been used for the construction of Landmark Pluit project in Jakarta, Indonesia. To ensure excellent performance and safety, the crane is designed with high operating speed and strong anti-wind capability, said XCMG. The crane also features ergonomic design and is fitted with a spacious cab for operator comfort.

One of the challenges on the project was the restricted job site. There was not much space for the site team to store the machine components and fix the truck crane at the same time. However, the XGTT200’s boom can be mounted in sections, so the team was eventually able to save enough floor space for the truck crane. The process took only three days to complete, from the initial mounting to final debugging and jacking.

XCMG said it deployed its experts in Jakarta throughout the year as well as stored some machine components to guarantee quick and convenient after-sales service.

Enquiry: export@xcmg.com
Peri’s cost effective solution for Capitol Hill Station

The length of Seattle’s metropolitan railway system (Light Rail) in the US is currently being extended by 5 km and includes increasing the number of stations from 18 to 20 – as part of the rapid transit project for the Greater Seattle region. Capitol Hill, one of the two new subway stations is around 100 m long and is being realised at a depth of 18 m. Huge steel-composite tubes with 1 and 1.50 m diameters respectively brace the underground structure on two levels.

Peri has developed a cost-effective solution for this project. The walls and reinforced concrete beams could be monolithically constructed, i.e. concreted in one pour, thus avoiding the need for construction joints and resulting in assembly cost savings. In addition, Peri’s solution is largely based on the Variokit engineering construction kit with rentable system components, which are available at very short notice.

The Variokit formwork carriage construction for the nine deepest sections, each 12 m long and 8 m high, has been designed with two parts. As a result, it has also been possible to use the top half of the carriage for the remaining two levels after completion of the lower level. These were realised using six concreting cycles each time with heights of 5 and 4 m respectively.

The Peri formwork carriage is hydraulically operated, and moved along on the reinforced concrete edge beams of the respective lower level by means of heavy duty rollers. The HD 200 heavy-duty props were used here as temporary supports for the edge beams in order to safely transfer the additional loads from the formwork carriage and the respective concreting cycle. Furthermore, the Variokit unit served to support the huge steel tubes so that it was also possible to fill these with concrete at the same time as the walls were being concreted.

To transfer the high loads resulting from the concreting operations for the 1.22 m thick reinforced concrete slab of the subway station into the longitudinal edge beams, the formwork carriage was adapted to suit the changed load situation. However, the Variokit system components as well as the hydraulic handling and easy movability of the complete formwork carriage unit continued to be used.

Furthermore, Peri Trio, Vario GT 24, SB Brace Frame, Multiflex, Multiprop and Peri Up formwork and scaffold systems supplemented the comprehensive project solution.

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The Interlace is iconic, unconventional and a true engineering marvel, designed by the Office for Metropolitan Architecture (OMA)/Ole Scheeren. Located at the intersection of Alexandra Road and Depot Road in Singapore, the project defies the typical design of vertical towers for residential developments; instead, it has embraced the ‘vertical village’ concept where the structures are stacked in a hexagonal formation, facilitating light and air to flow through the architecture.

The complex consists of 31 superblocks housing a total of 1,040 residential units, and has a site area of 80,761.8 sq m with a gross floor area (GFA) of 169,600 sq m. All blocks are identical in size at 16.5 m wide by 70.5 m long by 22 m high, with each block being six storeys high.

T.Y. Lin International Pte Ltd as civil and structural engineer on the project, worked together with the main contractor, Woh Hup Private Limited, to deliver the winning concept for the design and build project for Ankerite Pte Ltd. The process encompassed the consideration of both design and construction methodologies for the long span transfer structure, drawing inspiration from T.Y. Lin’s deep expertise in pre-stressing and bridge engineering design.

The Interlace was successfully completed in November 2013, more than two months ahead of schedule. It won the 2014 BCA Design and Engineering Safety Excellence Award in the residential category and the inaugural Urban Habitat Award from the Council on Tall Buildings and Urban Habitat in the US.

Delivery of such an enormous project presented a number of challenges to be overcome.

Massive challenges

1. Design and construction of the long span transfer structure:
The architectural concept demanded the design of a long span transfer structure that would support the six-storey block across two main cores at the ends of each block. The highest block was constructed at 60 m above ground, with a total of 20 transfer deck structures. The challenge was to design a suitable transfer structure and devise an appropriate construction method to facilitate the construction of the superblocks at height. The development of the optimum construction methodology and the design of the deck and the main cores were heavily inter-related. Thus, the influence of the design on the construction methodology and vice versa was identified early and taken into consideration during the design development.

2. Interlocking blocks that generate multi-directional stresses and deformation:
The unique interlocking building arrangement presented the challenge of multi-directional stresses and deformation that are not common in normal buildings. Under the loadings from the elevated six-storey blocks, the main cores are subjected to forces in different directions at each super level stack.
3. Construction sequence of the super blocks:
Owing to the stacking nature of the design, the normal construction sequence of constructing each block independently was not possible. Construction of the blocks had to be sequential, with the progress of the upper blocks dependent on the lower blocks. Therefore to study and assess the impact on the main cores this was fully incorporated into the structural model as part of construction engineering.

4. Optimisation of the structures to maximise space utilisation:
The scarcity of land and space in Singapore also posed challenges in the design of the development. As a result, the design demanded that the team consider ways to maximise space utilisation by optimising the structural sizes.

Design solution
The 31 superblocks, which are stacked in a hexagonal orientation on top of one another, are supported by two main cores located at both ends of the building. These form the main load transfer mechanisms for the building to the foundation. The buildings overhang by approximately 10 m from the main cores. The span between the main cores is 27 m long at the centre and 35 m long at the edges. The highest level is the 24th storey, with four stacks of super levels placed in a staggered orientation on top of one another.

Continued overleaf...
The challenge of working on a long span transfer structure that minimises the building dead load and maximises space utilisation inspired T.Y. Lin to draw on its expertise in pre-stressing and bridge engineering design. As a result, a 2.5 m deep post-tensioned pre-stressed concrete box girder transfer deck was proposed, in lieu of the original tender proposal of approximately 10 m deep reinforced concrete spine wall with cross walls. This freed up space on the units directly above the transfer deck.

Without the thick and heavy spine and cross walls, the overall building weight was significantly reduced, enabling smaller vertical elements. This transfer system is a simple transfer structure with a clear load path to the foundation. It is safe and robust and contributed significantly to the constructability of the project.

The 2.5 m deep transfer deck structure is made up of three units of post-tensioned pre-stressed concrete beams: two 1,000 mm-wide edge beams, 35 m-long span; and one 1,100 mm-wide central beam, 27 m-long span. Top and bottom slab thicknesses of 300 mm complete the box girder.

The box girder system provides strong lateral and torsional stability. The transfer deck structure transfers the load to the foundation via a mega frame in the main core. This consists of 2.5 m deep beams that tie together the six mega columns, providing the required rigidity for resisting the pull effect from the transfer deck bending moments.

To achieve a safe and robust structure, rigorous and highly detailed analysis was carried out utilising full-scale 3D models to determine and understand overall building behaviour. Results from this envelope analysis were used for the design, and

Continued on page 76...
redundancy was built into the construction methodology of the transfer deck.

The 23 vertical main cores form the main backbone of the buildings for direct load transfer to the foundation piles and provided the lateral stability. Thanks to the interconnected buildings layout, performance of overall stability under wind and notional load is good, with a maximum building drift of 1/1,100, which is well above the maximum limit of 1/500.

**Mega frame design**

One of the challenges arising from the unique interlocking building arrangement is the multi-directional stresses and deformation that are not common in normal buildings. Under the loadings from the elevated six storey blocks, the main cores are subjected to forces in different directions at each super level stack. Therefore, the short-term and long-term effects had to be carefully considered in the analysis and design. These short-term and long-term effects included secondary stresses due to pre-stressing; shrinkage and creep of concrete material; interlocking stresses due to stacking of super blocks in different directions; and lock-in force due to construction sequence.

Another challenge was the use of high strength concrete to optimise the structural sizes. This resulted in maximum space utilisation. With reduced sizes in the mega columns, high strength concrete grade of 80 MPa was proposed to increase the capacity. More rigorous design considerations and stringent quality control in the construction was required. The Interlace was one of the first projects designed to BC2:2008: Design Guide of High Strength Concrete to Singapore Standard CP65.

**Structural modelling**

Rigorous and comprehensive structural analysis was carried out to study and capture overall building behaviour arising from the complex nature of the building layouts and the magnitude of the project. This included staged construction analysis, which is not commonly performed on a typical building, as well as global analysis to obtain the interlocking force and moment envelope in mega columns; and local analysis for the design of transfer decks. The impact on the main core that resulted from each stage of the construction, especially at the transfer deck location, was carefully considered in the design.

A full-scale 3D model of all 31 blocks was built for the global analysis in order to simulate the long and short term effects mentioned earlier. The findings were then used for the design of the columns and core walls.

Local analysis provided the stress distribution for the transfer decks through SAP2000 shell elements model. Critical locations were identified and designed accordingly. For ultimate limit state (ULS) design of the box girder, a more conservative approach was used. A separate frame model was built that used only the transfer deck, with the upper six floors simulated as loadings, that is, without the stiffness of the upper floors.

**Transfer deck construction**

Construction of the transfer deck at height was a challenge, especially at the highest stack where the soffit of the block is almost 60 m above the ground level. Considerable thought went into the selection of the construction methodology. Finally, a ‘balanced cantilever’ methodology, commonly used for construction of bridges is adopted for this heavy transfer deck structure. This method will help to reduce the construction load on the structural steel shoring as each segment of the box girder is cast in stages.

Redundancy was built into the casting sequence so that after each stage of casting, the transfer deck is self-supporting. Subsequent stages were cast to the point where the deck meets in the centre.

The key to the successful delivery of the development was thinking outside the box and cleverly adapting bridge engineering to deliver a robust structure and optimise space utilisation. This was facilitated through great teamwork, close collaboration and a strong safety culture shared by all project team members including the developer, contractor and consultants.

The article courtesy of T.Y. Lin International Pte Ltd.
Ultimate Choice for Power and Quality

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The A2 motorway near Lucerne is one of the busiest roads in Switzerland. After more than 30 years of intense use, this section recently underwent a revamp. It started at the end of 2010 and was completed in mid 2013. To prevent traffic congestion in the urban areas, work was carried out mainly at night and it took around a year to complete each carriageway. The project is part of a modernisation programme called CityRing, which is estimated to total over 400 million Swiss Francs when completed.

**A2 motorway tunnels**

Work in the Sonnenberg and Reussport Tunnels, 1.5 km and 665 m long respectively, included repair and reconstruction of the concrete, road resurfacing, installing safety booths and a new ventilation system, and building a new drainage system. Contractor on the project was Arge CityRing Luzern.

Here, various Mapei products were used. The surfaces of the tunnels were repaired using Mapegrout Gunite 300 AF mortar with accelerated setting for dry mix shotcrete. To repair the deteriorated sections of the concrete structure, Mapegrout Thixotropic fibre-reinforced mortar was used, mixed with Mapecure SRA curing admixture to improve its air curing cycle and further reduce hygroscopic shrinkage. Before applying the mortar, the exposed steel reinforcement rods were treated with Mapefer anti-corrosion mortar. The surfaces were repaired using Mapegrout 430 fine-grained, fibre-reinforced, thixotropic mortar mixed with 30 percent of Planicrete latex.

Reconstruction work was completed by smoothing the surfaces with Mapefinish two-component mortar. To renovate the tunnels, Planitop Fix cementitious mortar was also used, as well as Mapefill high-flow grout to anchor the metal parts to the concrete structure and Adesilex PG4, two-component epoxy adhesive for waterproofing joints and bonding curbs on asphalt. In both tunnels, jet fans were installed to help extract fumes in the event of a fire.

The surfaces of the ventilation ducts were treated with Eco Prim Grip primer and Ultraplan Maxi levelling compound. The drainage system in the Sonnenberg Tunnel was also in need of repair, and Triblock Finish was recommended. This three-component thixotropic mortar has the capacity to protect and smooth out...
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concrete surfaces subject to damp (channels, drainage manifolds and pipework) where good chemical resistance and high resistance to abrasion is required.

In addition, Lamposilex ultra-fast setting and curing hydraulic binder was applied to stop water leaks, while Mapecoat I 24 epoxy resin coating was used to finish off the surfaces - a protective and anti-acid coating product for concrete surfaces.

The surface of some of the concrete elements in the Sentirbrücke (the bridge that connects the two tunnels) was deteriorated in certain areas. Work started by removing the deteriorated portions using high pressure water jets. The areas where the concrete had been removed were then repaired with MaPEGROUT Thixotropic.

Mapegrout Thixotropic was also used to repair certain areas of the concrete of the carriageway on the bridge. Another solution proposed to repair and reconstruct the surface patches of the north and south-bound carriageways was to remove the deteriorated parts with high pressure water jets, saturate the substrate with water and apply Mapegrout SV and Mapegrout SV T controlled-shrinkage, thixotropic mortars, suitable for repairing concrete and fixing inspection shafts, manholes and urban features. Mapecure E30 film-forming curing compound in water emulsion was used to protect fresh mortars due to its short hardening time.

Enquiry: mapei@mapei.com.sg

Above: Reconstruction of the surface patches on the carriageway of the bridge connecting the two tunnels with Mapegrout SV and Mapegrout SV T.

Left: Anchoring metal elements with Planitop Fix.

Below: The walls inside the tunnels after applying Mapefinish two component mortar.
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Teamfield Building Contractors Limited is currently working on the renovation of the Royal Garden Hotel in Kowloon, Hong Kong. Set to complete by the end of this year, the hotel will grow from the current 12 floors to 15 floors.

Due to the project requirements, a tower crane was needed on the hotel roof; however, the height of the building and narrow streets surrounding the hotel would be an impediment to the crane’s erection process. In the end, Teamfield decided to use a 10CJ140 tower crane from Comansa Jie, Chinese subsidiary of Linden Comansa. The crane was supplied by Proficiency Equipment, Linden Comansa’s official distributor in Hong Kong. Its modular and lightweight sections and components ensured a quick and easy erection, and with its technical features (maximum load of 8 t), the crane was deemed ideal for use at the hotel roof.

Top and above: The Royal Garden Hotel in Hong Kong is undergoing a makeover.
For the erection of the crane, two derrick cranes with 1 and 5 t of maximum load capacity respectively were mounted on the roof. These two cranes were used to lift, from the side of the building, the components of a 16 t roof crane, which once assembled, served to erect the Comansa Jie 10CJ140 tower crane.

The tower crane was required to sit over the roof without any hole drilling on the permanent structure. Therefore, a 6 m folding cross base was placed inside the rooftop pool, saving a 1.27 m drop in the swimming pool by using support pieces and levelling the base using the height-adjustable pyramids. When a few tower sections were assembled, a hydraulic jacking cage was added to the tower, and finally the different sections of the rotating part were added.

It only took 28 days to carry out all the tasks, from the assembly of the first derrick to the erection of the Comansa Jie 10CJ140 crane, thus meeting the deadlines set during the planning phase. “Teamwork between all stakeholders has been fundamental to come up with the best solution. In addition, we have had to negotiate with the authorities and managed a very tight plan. The experience has been a little stressful but very satisfactory for all parties,” said Paul H H Hung, operation and marketing manager of Proficiency Equipment.

A Comansa Jie tower crane is placed inside the rooftop pool.
One of China’s major road networks is the Datong to Tianzhen expressway in Shanxi province. The project was completed within three years and carried out in two phases. The first stretch from Datong to the Tianzhen interchange was opened to traffic in late October 2011, while the stretch from Tianzhen to the connecting road with the Peking-Xinjiang expressway in Hebei province was completed in 2012.

The nearly 100 km long expressway features a four-lane road comprising two lanes with a combined width of 10.5 m in each direction. The pavement consisted of a cement-treated base of sand and gravel, a cement-treated crushed-stone base and three asphalt layers. A Vögele Super 3000-2 was used to place the cement-treated crushed-stone base in two 17 cm layers, with pave widths of 12.5 and 11.5 m, without joints. With its SB 300 fixed-width screed, the Super 3000-2 can achieve a laydown rate of 1,600 t/hr, pave width of 16 m and layer thickness of 50 cm. The machine also features the ‘dash 2’ technology and ErgoPlus operating concept, and is powered by a Deutz engine rated at 300 kW.

According to Jiang Chao, project manager for the contractor 5th Construction Company Ltd of the China Railway Construction 15th Corporation, the 34 cm thick cement-bound crushed-stone base was even paved in a single layer on some stretches. The only reason behind the decision to pave in separate layers on other sections was the wish to assure the required degree of compaction by the rollers.

Top: The Vögele Super 3000-2 was used on the Datong to Tianzhen expressway project. With its SB 300 fixed-width screed, the machine can achieve a laydown rate of 1,600 t/hr, pave width of 16 m and layer thickness of 50 cm.
Above: The new Datong to Tianzhen expressway will later link up with Beijing and Tianjin.

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期待更多精彩...

More exciting to be continued ...

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