



**Putzmeister**

# post



New ideas:  
Flexible  
pump rental

New record:  
19.793 m<sup>3</sup> concrete  
in 42 hours

News on the road:  
Events at  
Putzmeister

New tracked  
for the world's  
oldest underground

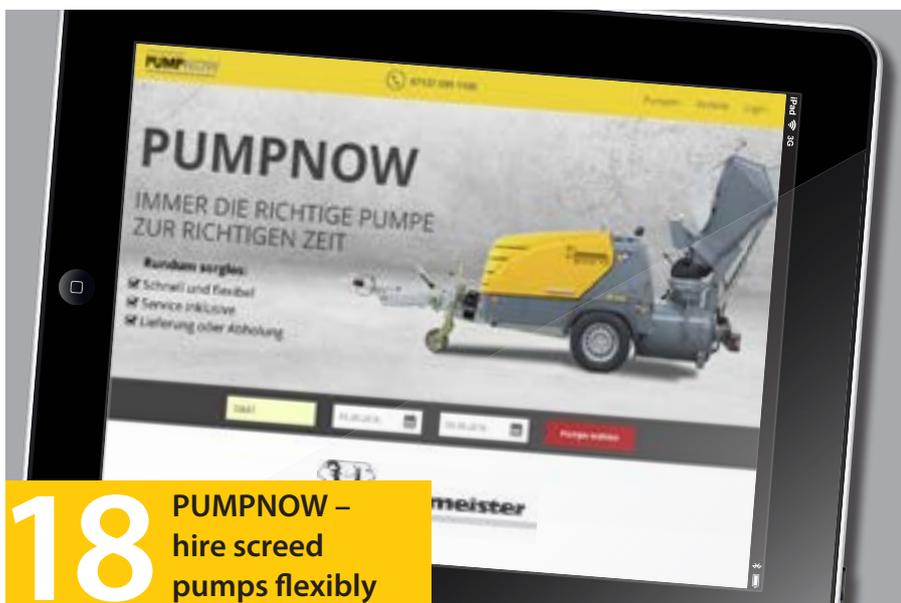
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**4** LNG Tanks in the Russian Arctic



**12** Concreting in London's Underground



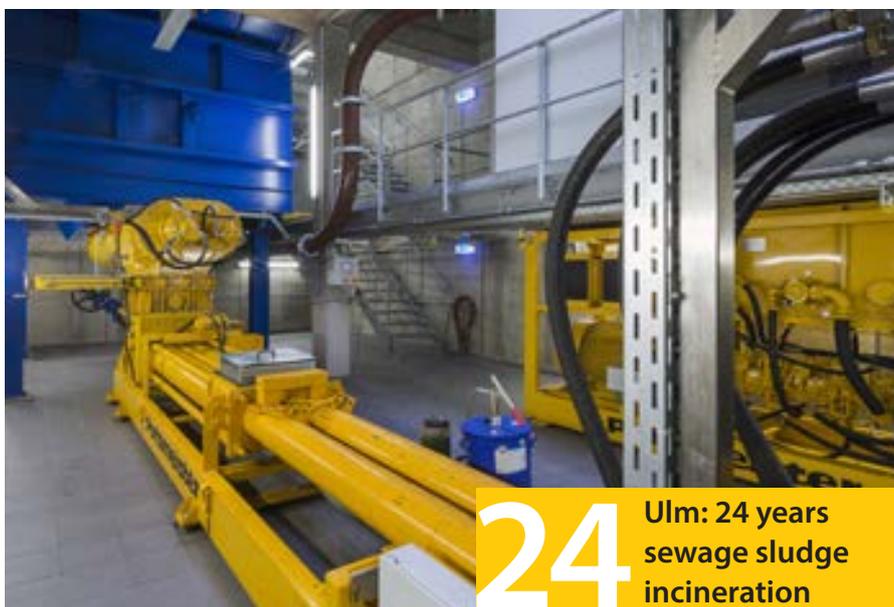
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# Ice-cold professionals: Putzmeister concrete pumps construct massive LNG tanks in the Arctic

Velesstroy, a partner and repeat customer of Putzmeister Russia, was in charge of part of a unique major project in Russia, with successful results: The construction of all concrete structures belonging to “Yamal LNG”, a gigantic plant for liquefying natural gas (LNG – Liquefied Natural Gas) extracted from the Yuzhno-Tambeyskoye gas field on the Russian Arctic peninsula of Yamal.

Velesstroy is one of the largest companies in Russia for the production of buildings for the oil and gas industry and for power supply.

The first team from Velesstroy set out for the Yamal Peninsula in September 2013. The group's main task was to build a settlement for 1,500 employees. The company also had to construct parking spaces, fire stations, high-voltage lines and other supply systems. While working on the project, Velesstroy concluded a contract with French company VINC for the construction of four cryogenic (low-temperature) storage tanks for liquefied petroleum gas. >>



The massive LNG tanks are 46 m high and have a diameter of 78 m.

Each of the four cryogenic storage tanks can hold 160,000 m<sup>3</sup> of liquefied petroleum gas. The calculated total capacity of the deposits was more than 1.2 trillion m<sup>3</sup>. The operating output for the exploitation, storage and supply of gas will be 27 billion cubic metres per year. In the already cold Arctic, less energy is required to liquefy gas, which is why the planned production output of Yamal SPG is higher than similar works at warmer latitudes.

Each cryogenic storage tank has a diameter of 78 m and a height of 46 m, while the foundation has a diameter of 87 m. One challenge was the selection of a correct concrete mix which was suitable for the Arctic conditions. Three concrete plants were built to produce the massive quantities of concrete required.

The following approximate quantities of concrete were required for each cryogenic storage tank:

|            | Strength class | Quantity             |
|------------|----------------|----------------------|
| Dome       | C45            | 2,900 m <sup>3</sup> |
| Side walls | C55            | 8,250 m <sup>3</sup> |
| Base plate | C45            | 5,300 m <sup>3</sup> |
| Foundation | C45            | 1,000 m <sup>3</sup> |

**More than 69,500 cubic metres of concrete with varying degrees of strength were used in total.**

The concrete's water permeability class is W8, the maximum water pressure on the test sample was 80 bar, and the frost resistance is grade F200. This corresponds to a minimum of 200 alternating freezing and thawing cycles and is particularly important when constructing low-temperature installations in the Arctic. This region experiences minimum temperatures of down to  $-50\text{ }^{\circ}\text{C}$  and maximum temperatures of up to  $+30\text{ }^{\circ}\text{C}$ .

All storage tanks were poured continuously, with the wall growing two metres every day. One of the massive LNG tanks was constructed in just 22 days.

The foundation and individual parts of the tank wall were built using truck-mounted concrete pumps. The Putzmeister BSF 56-5.16 H has proved itself to be the ideal truck-mounted concrete pump for challenging high-rise construction projects, where a large reach and high power are required together with reliability and ease of handling. The boom design and the One-Side Support, fitted as standard, result in the machine's compact design and versatility during use. The output is  $160\text{ m}^3/\text{h}$  with a delivery height of 55 metres.

&gt;&gt;



## Large project concreting

Putzmeister stationary pumps concreted the walls of the LNG tanks. A total of seven BSA 1407 D and two BSA 2110 HP D stationary pumps together with seven RV 13 rotary distributors were used on the construction site. BSA 1407 D pumps have an output of up to 71 m<sup>3</sup>/h, whereby the concrete mix (grain size 25 – 40 mm) can be pumped up to

100 m vertically or up to 200 m horizontally.

They are easy to transport on the construction site thanks to their low weight and large ground clearance, have a protective housing made of high-strength GRP and are equipped with open-channel OPS hydraulics, a 115 kW four-cylinder Deutz engine and a rinsing pump (50 l/min, 20 bar).

The new hopper design ensures optimum accessibility during loading and maintenance alike.

The pump's operating and measurement data is recorded and managed by the Ergonic system and can be viewed by the operator on the display.

The Putzmeister BSA 2110 HP D is a powerful high-pressure concrete pump with a long piston

**Putzmeister stationary pumps were responsible for constructing the concrete walls of the tanks**



stroke. It proved to be particularly suitable for high-rise construction (concrete delivery height up to 200 m or up to 1,000 m horizontally).

The pump, with its modern design and robust plastic housing, has a 330 kW six-cylinder Deutz diesel engine, an external hydraulic gate valve connection and wear-resistant carbide parts. The output is up to 102 m<sup>3</sup>/h at 115 bar and 70 m<sup>3</sup>/h at 220 bar.

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**Putzmeister technology was already in use in a large number of major projects in Russia:**

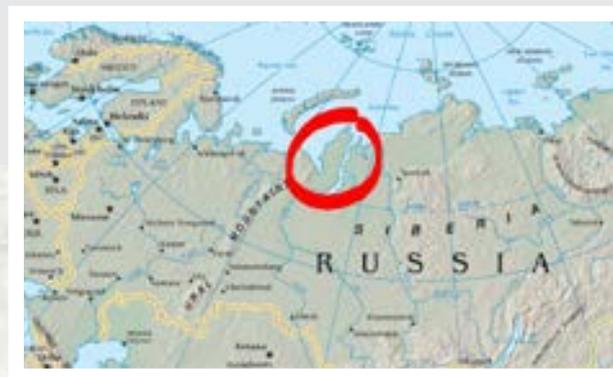
- Novy oil pump factories
- Urengoy in the Krasnoyarsk region, particularly on Yamal and near Vorkuta
- Sports facilities in Nadym, Purpe, Tarko-Sale and Norilsk
- Nuclear power plants: Novovoronezhskaya, Rostovskaya, Leningradskaya, Beloyarskaya, Belorusskaya and Boguchanskaya
- Hydroelectric power stations
- Bridges in the Zolotoy Rog Bay and bridge to Russky Island off Vladivostok
- Sakhalin-1 projects
- Moscow City and Lakhta Center



**Yamal LNG**

The works for liquefied natural gas production will process 16.5 million tons per year from the resources of the Yuzhno-Tambeyskoye gas field, which was discovered in 1974. The field consists of five layers of gas at the surface and thirty-seven deep gas condensate layers which are located in the north-east of the Yamal Peninsula. Gas condensate – also known as methane hydrate, methane ice or flammable ice – consists of methane embedded in solidified water, whereby the water molecules fully surround the methane.

When the plant is commissioned in 2017, initially with one of three production lines going into operation, the intention is to transport the liquefied gas by ship via the new Sabetta port.



>>

## Large project concreting

In addition to constructing the frost-resistant gas tanks, Putzmeister technology was also used in the port and in other sections of the buildings. In May 2014, Velesstroy commissioned Teknip RUS with the construction of office buildings, industrial buildings and preparation halls. Teknip RUS was also charged with the concreting and post construction work for all three building sections, involving a huge number of 17,000 posts,

corresponding to a total of 365,000 m<sup>3</sup> of concrete.

Extremely high demands were placed on the technology. The decisions relating to this project were based on quality, wear resistance and references in challenging climatic conditions. Project-related and maintenance-related support, which was provided by qualified personnel from Putzmeister Russia, was also taken into consideration.

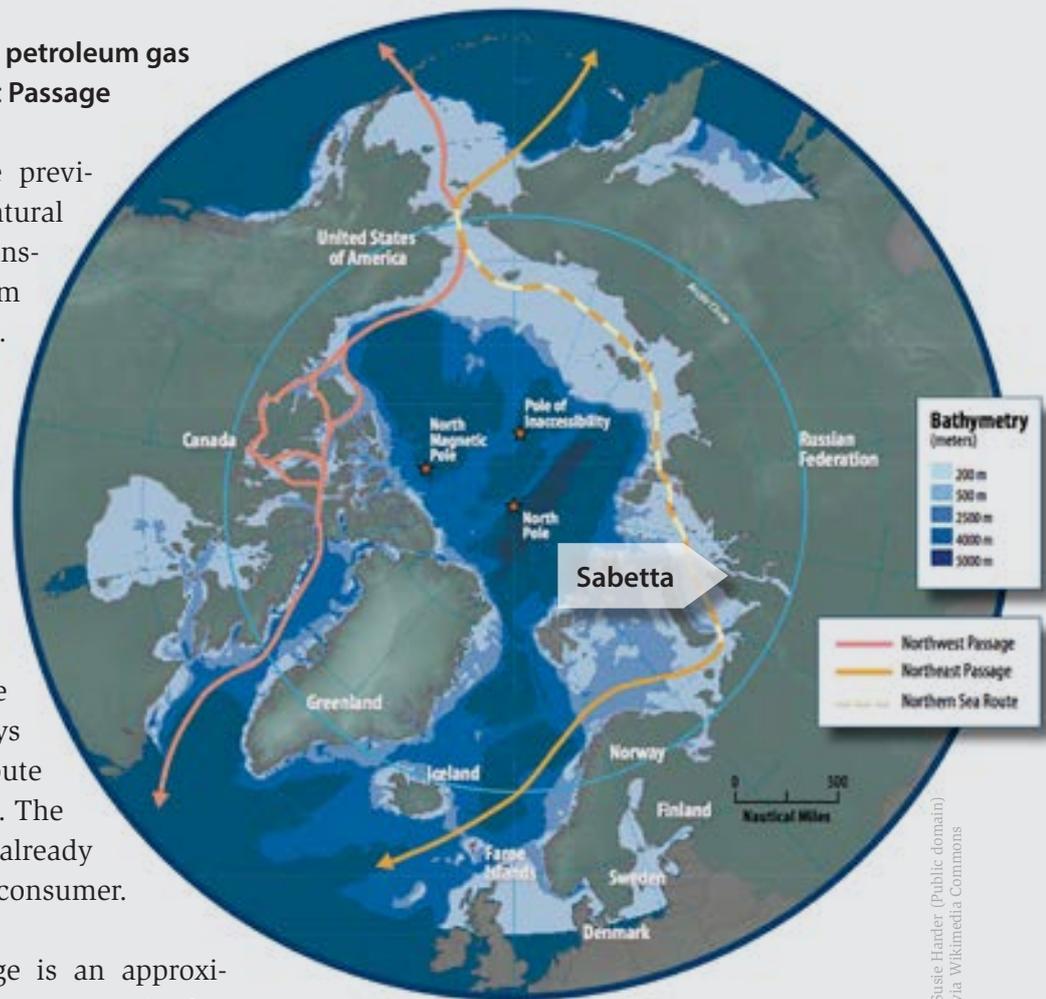
The distance from the construction site was a critical factor for the performance of maintenance work. A wear parts warehouse was constructed on site to minimise risks involved in partial supply and ensure maximum availability. Both parties responded rapidly to resolve various issues which arose in order to complete this demanding task by the deadline set, while still ensuring a high level of quality. ■

**The Kara Sea, above the Arctic Circle, experiences temperatures of down to 50 degrees below zero, pushing people and machines to their very limits. Concreting was performed successfully and rapidly thanks to Putzmeister technology in particular.**



### Transporting liquefied petroleum gas through the Northeast Passage

While pipelines were previously required for natural gas, it can now be transported in liquefied form using large tankers. In summer, the aim is for the gas tankers to travel from Sabetta through the Northeast Passage, which was unpassable until a few years ago, in order to reduce the sea route to China from 36 days (using the indirect route through Europe) to 17. The People's Republic is already standing by as a main consumer.



The Northeast Passage is an approximately 6,500 km long sea route in the Arctic Ocean along the north coasts of Europe and Asia, extending from the White Sea to the Bering Strait. In the mid-twentieth century, maritime passage via the Arctic Ocean became a matter of routine in the Soviet Union. Many research ships, navy ships and cargo ships were on the move on this route during the summer months. The former USSR even established its own authority, known as the “Chief Directorate of the Northern Sea Route”, which was responsible for the use of the Northeast Passage. Up to 35,000 people were employed there.

On the collapse of the Soviet Union, high transport costs (primarily for icebreakers and ice clearance) resulted in a decrease in maritime traffic. The use of the Northern Sea Route virtually came to a standstill, with serious consequences for the cities located along it.

However, climate change has made passage financially viable again. In recent years, the Northeast Passage has remained completely ice-free for a few weeks between August and the beginning of October, with this route apparently being passable for an increased period each year. During the 2013 shipping season, as many as 71 commercial journeys were made through the Northeast Passage, more than seven times as many as in 2010.

The Russian government has also declared that expanding the Northeast Passage to transform it into an important arterial route is now one of its official objectives.

[Source: Wikipedia]



# Great job in London Underground

In May 2016 Camfaud Concrete Pumps Ltd supplied pumps and staff for London Underground's (LU's) Liverpool Street Diamond Crossover Renewal. This contract was carried out by Track Partnership, a strategic alliance between LU and Balfour Beatty Rail, responsible for delivering track and drainage renewals across the Tube network.

The Liverpool Street Diamond Crossover is situated approximately 50 metres east of the station, allowing Central line trains to enter and exit the two sidings. At over 60 years old, the track condition was in line for a full renewal. To facilitate the work, over 300 cubic metres of concrete were pumped from street level over 15 metres, down a vent shaft on Bishopsgate Road. Over 400 tonnes of rubble were removed and new track was installed to complete the project, which involved extensive collaboration between a number of stakeholders including Transport for London (TfL), Track Partnership, Broadgate Estates, the City of London Corporation, Hanson Concrete and Camfaud Concrete Pumps.

Three pumps were used for the contract, two working and one on standby. The working pumps were both Putzmeister BSA1409D stationary models while the standby pump was a mobile one from another manufacturer. The mobile pump was chosen as the standby because it's quicker to deploy in the event of one of the stationaries failing. Fortunately, the backup solution was not required. Both of the stationary pumps were used for the duration of the pour, the pumps fed separate pipelines to supply concrete to two concreting gangs working in parallel in each of the running tunnels and the cavern.

The pumps were situated in Bishopsgate in the northbound bus lane with traffic lanes subject to a road closure. Track Partnership were extremely careful to protect the environment in this sensitive area with polypropylene sheeting, geotextile fabric, rubber mats, plywood sheets, bubble wrap and drip-trays all being used.

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### High pressure pipeline – down the shaft and into the tunnel

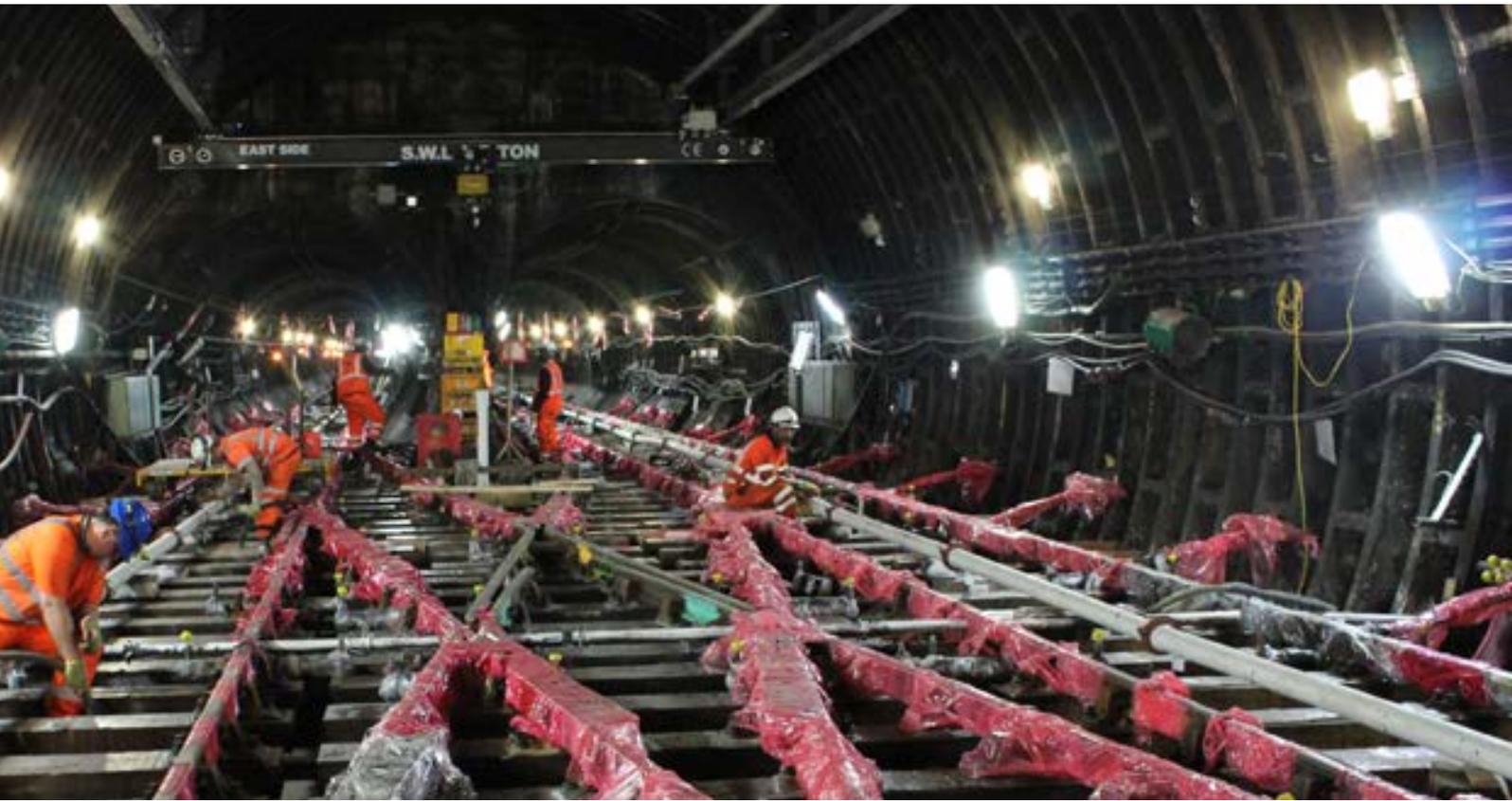
#### Down the shaft and into the tunnel

The pipeline route was rather convoluted and required a large number of bends, more than ideal, but was chosen as the best solution in the circumstances. The pipeline exited the pumps and

ran along the Bishopsgate pavement turning down into a 15 m deep shaft. A 90 degree bend diverted the pipeline along a cross-passage before another 90 degree bend took the pipeline down 6 m into the tunnels. A final 90 degree bend, a footed bend to add support, diverted the line along the tunnels to the work area.

The concrete for the project was supplied by Hanson Concrete. The mix used was designed for

an earlier contract, the major engineering works on the Victoria line at Walthamstow, carried out in August 2015. It was successfully pumped through 500 m of pipeline on that contract and so it was an easy decision to choose the same mix for the Liverpool Street works. The mix contained a CEM 1 / GGBS blend, superplasticiser and retarder admixtures and a small addition of microsilica slurry to ensure that the mix held together in the line and did not bleed as it was placed and finished. Hanson also supplied 4 cubic metres of ready-mixed grout ahead of the concrete to grout the pump and pipelines. >>



Installing the pipelines in the cavern

**GGBS** stands for “Ground Granulated Blast Furnace Slag”. Occurring as a by-product in steel production, granulated slag can replace Portland cement to an extent of up to 70 %.

This results in fewer CO<sub>2</sub> emissions and reduced energy requirements. The concrete is more durable and more resistant to external influences. It is also much lighter in colour – a plus where the aesthetics of modern buildings is concerned.

Concrete flowing into the trackbed



The concrete pumping operation was completed in two stages. Firstly, two parallel chambers in the cavern beneath the track had to be filled: each chamber had a volume of approximately 105 cubic metres. These were filled through five ports opened along the length of the chambers. Secondly, the track bed had to be poured, embedding the sleepers into the concrete slab.

Filling the chambers was a relatively simple process. The concrete was introduced through the ports and vibrated to ensure that it was fully compacted and the chambers were completely full. The concrete to fill the chambers was pumped at approximately 50 cubic metres per hour. Consideration was given to designing a separate mix for the chambers but, given the proven quality, flow and 'pumpability' of the slab mix, it was decided to use this mix for both sections of the job.

Pouring the slab concrete was a more onerous task due to the obstructions presented by the sleepers and the track, and the complex finishing required. The pumping rate was reduced to around 15 cubic metres per hour and this part of the job was a much more stop / start affair.



### **Achieve something remarkable – we did!**

At the end of the pour, the pipes were cleaned out by Camfaud's staff using compressed air. This is an efficient method of cleaning medium length pipelines but must be carried out by competent, experienced operatives. Using the latest blow-out adapters fitted with pressure gauges and oversized safety vents, the pressure in the line was very closely controlled at 2 bar with the line full, 1.5 bar once the line was half empty and 0.5 bar at the end of the blow-out procedure. Despite having this fine control, all of the concreting gang were required to stand in a safe area behind the pipeline or in the other running tunnel while the concrete was being cleaned from the pipeline.

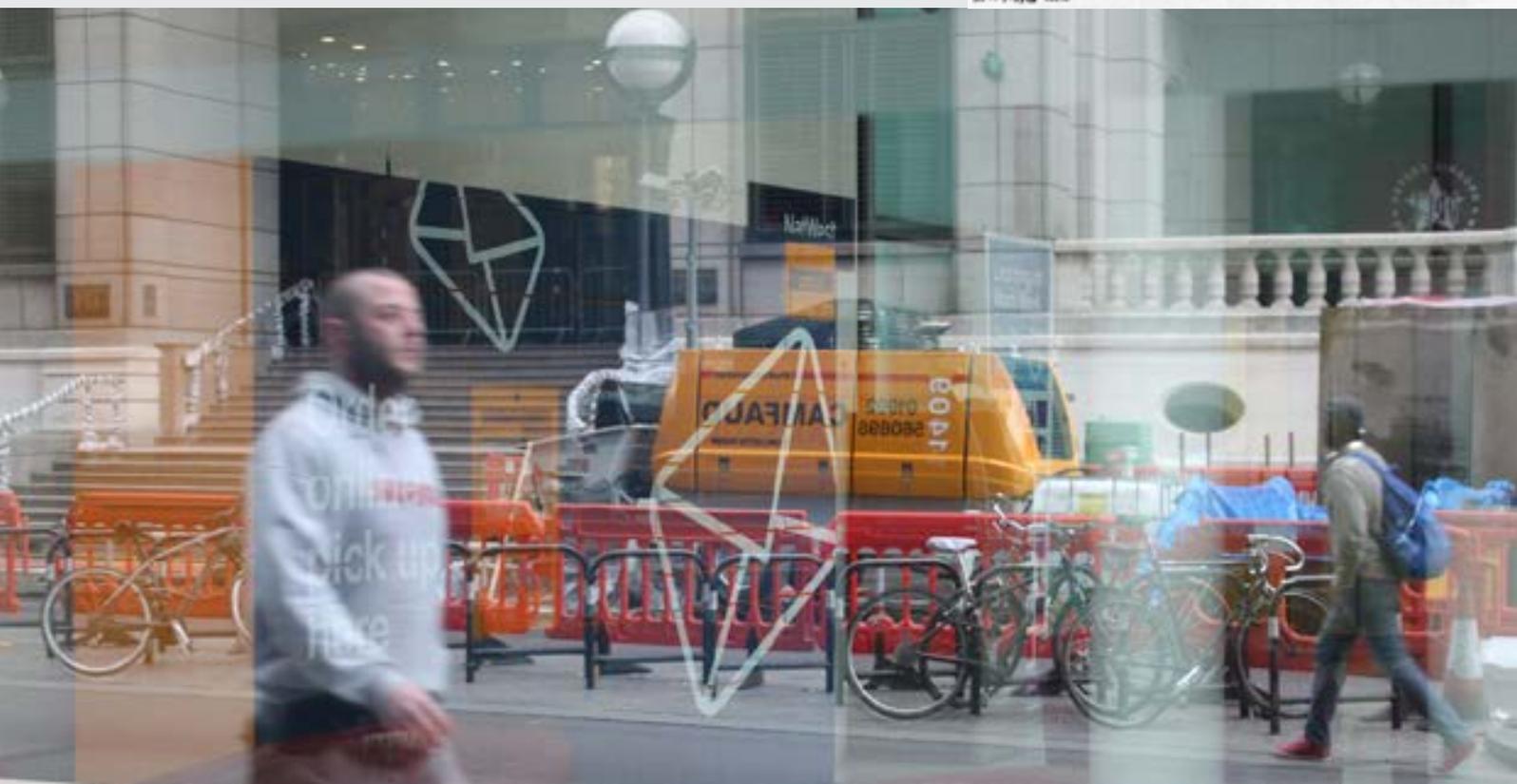
In total, just over 300 cubic metres of concrete was poured during the concreting works. The pour took 12 hours to complete and this included grouting the pipelines, pumping the concrete into the chambers and track slab, and cleaning out the pipeline and pumps. With good planning and first class teamwork between Track Partnership and Camfaud Concrete Pumps, the concrete pumping operation was completed ahead of schedule allowing Track Partnership more time to complete their works prior to handing the Central line back to Transport for London. ■



## The Tube

The London Underground is the world's oldest underground railway and boasts Europe's longest network. It links the British capital of London with the City of London and some neighbouring areas. The first section of the Metropolitan Railway line (now known as the Metropolitan Line) was opened on 10th January 1863 as an underground railway for steam trains. The London Underground was the world's longest underground railway for almost 150 years, but it is now the third longest, after the Shanghai Metro and Beijing Subway. On average, around 3.2 million travellers use the underground system each day, with this figure rising up to 3.7 million on weekdays.

[Source: wikipedia]



# PUMPNOW – always the right pump at the right time

Putzmeister and etventure jointly develop digital business models. As an example: A first digital project has just got underway with the launch of PUMPNOW, a market-ready online platform for the flexible hiring of screed pumps.

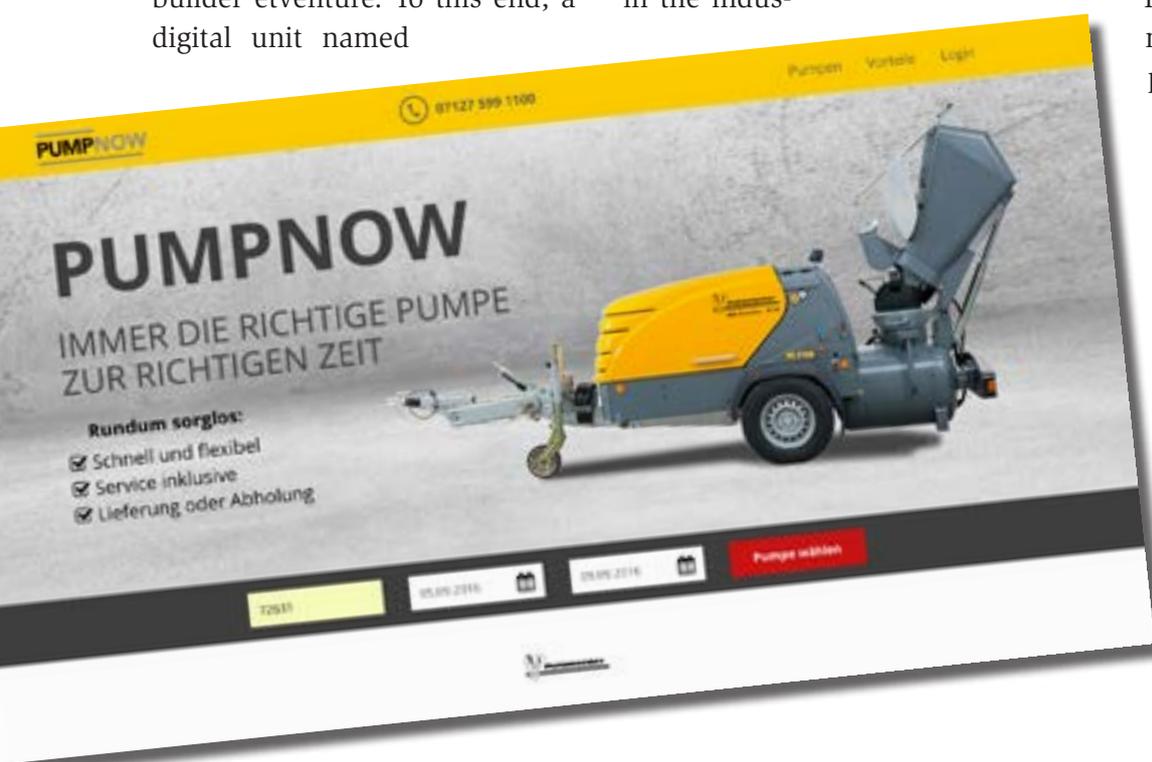
The digital revolution is affecting all industries and sectors. Even classical industries such as mechanical engineering and the construction industry have to adapt to the new digital reality. Since October 2015, Putzmeister has been developing digital business models in collaboration with digital consultancy and company builder etventure. To this end, a digital unit named

“Innovation Factory” was set up; its mission is to identify customer problems, devise solutions, and then translate those into business ideas that are validated together with the customers. The first business ideas have now become ready for launching in the market.

“To us, it was always clear that the digital transformation would not bypass our rather traditional industry sector either,” explained Dr. Gerald Karch, CEO of Putzmeister Holding GmbH. “We are therefore proactive in engaging in the areas of innovation and digitization. Our years of experience in the indus-

try and our knowledge about our customers’ problems combined with the digital know-how, entrepreneurial approach, and implementation strength of our partner etventure provide ideal conditions for Putzmeister’s successful digital transformation. In collaboration with the etventure team, we were able to not only focus our innovation projects more strongly on the customer, but also develop new, innovative business models within a very short period of time,” said Karch. “Our aim is to actively shape our industry’s future with innovative business ideas.”

The different digital business models and innovation projects focus on diverse business areas and aspects of the Putzmeister value chain. PUMPNOW, a first market-ready digital project realized jointly by Putzmeister and etventure, has just entered its pilot phase. PUMPNOW is an online platform for the flexible hiring of screed pumps. Interviews with customers from the relevant target group about their wishes and problems indicated that specifically the purchase and oper-



ating costs for a screed machine of their own represent a hurdle particularly for smaller companies involved in construction. And it is often difficult to know in advance when certain types of machine will be required at different sites and plan accordingly. PUMPNOW provides tradesmen with quick and flexible access to the specialist machines they require, including the necessary accessories and desired equipment. Using the service also does away with potentially lengthy transport distances in the case of dispersed building sites, and all the costs for maintenance, service, and insurance are included and can therefore be budgeted for. Tradesmen ultimately only pay for the period during which the machine is in actual use and during which they are being paid by



the client for their services. The start of PUMPNOW is already proving the platform's great potential: PUMPNOW acquired its first customer within the first twelve hours and has since attracted many more inquiries.

There are further projects under development in the areas of Machine-to-Machine Communication and Building Information Modeling (BIM). "In future, it will be possible to plan and visualize in advance the building

site and the concreting processes in detail up to completion of the building work. Construction machines that are networked and integrated into the building site processes will play a key role in this," explained Dirk Jahn, Managing Director of the Innovation Factory at Putzmeister. "Working in close cooperation with et-venture, we are already setting the right course and positioning ourselves as a provider of digital solutions in the construction industry." ■

# PUMPNOW

# Putzmeister plays a part in the new world record at Geepas Tower

**During the construction of Geepas Tower in the United Arab Emirates, a new Guinness World Record was set for achieving the world's largest continuous concrete pour (19,793 m<sup>3</sup> in 42 hours).**

Gulf Asia Contracting is currently building this residential building for the Western International Group in Al Barsha, Dubai.

Unibeton Ready Mix – a Putzmeister customer for many years – supplied the concrete for the foundation with over 300 truck

mixers from three works and more than 2,500 trips. Unibeton also provided the concrete for the Burj Khalifa.

The concrete was supplied by 14 concrete pumps on the construction site and an additional five pumps as standby machines. Seven Putzmeister truck-mounted concrete pumps were used: One M 56-5 and six M 42-5s.

The reinforcement of this foundation alone comprises more than 3,000 tonnes of steel and took 150,000 working hours.

Spanning a surface area of nearly 500,000 m<sup>2</sup>, the Geepas Tower will feature 19 floors with 684 apartments, a fully equipped gym, a fitness centre, a swimming pool, a retail space totalling 12,000 m<sup>2</sup> and an underground car park with 730 spaces.

Completion is scheduled for March 2018. ■



## Record-breaking!

- 19.793 m<sup>3</sup> concrete pumped over 42 hours
- 300 truck mixers used
- Over 3000 tonnes of steel
- 150,000 working hours

# Customer training participant record in Dubai



**Last autumn, the After Sales staff at the Putzmeister Dubai office spent a week focusing on training.**

In collaboration with the Putzmeister dealer German Gulf Enterprises Ltd., extensive training for concrete pump operators and service employees of Putzmeister customers took place over two days at its branch at the Dubai Investment Park.

The experienced speakers Khodor Ali Taki and Louis Franssen imparted knowledge on how to operate the machines correctly, and above all, safely, and provided tips on correct maintenance.

The speaker Yazan Alzoubi offered training in the area of spare and wear parts, whilst also explaining the differences between original Putzmeister parts and parts from other manufacturers.

71 participants from 30 concrete pump providers from the United Arab Emirates took part. Since 2012, the service employees at the Putzmeister Dubai office have provided Putzmeister end customers in all the Gulf states with regular training and instruction.

With around 1350 participants to date, the successful training program is a key aspect when implementing the “Close to your business” motto. ■



# Telebelt TB 200 used in the construction of the Keeyask hydroelectric plant in Canada



With a horizontal reach of 61 m, the Telebelt TB 200 is Putzmeister's largest belt conveyor. Its horizontal reach makes it the perfect machine for placing mass concrete in large construction sites like those associated with building hydroelectric plants. Telebelts are manufactured at Putzmeister in the USA.

In the north of the Canadian province of Manitoba, 725 km north-east of Winnipeg on the Lower Nelson River, a hydroelectric plant is being built which is intended, upon completion, to generate an average of 4,400 gigawatt-hours of energy per year. The building works began in July 2014 and the generating station is due to be in operation from 2021. At present, around 1,500 employees are working for this project.

The generating station is being built by BBE Hydro Construction Limited Partnership. BBE is a joint venture between Bechtel Canada, Barnard Construction of Canada and EllisDon Civil Ltd. ■

## **Keeyask Cree Nations ensure they can preserve their way of life by getting actively involved in the project**

The Keeyask Project involves building a 695-megawatt generating station, an overflow and a dam, as well as the entire infrastructure (roads, dykes, power lines, etc.) needed for operations. Keeyask will be the fourth largest generating station in Manitoba – the most easterly of Canada's Prairie provinces.

The name of the province is derived from the Cree word “manitou bou” (“the narrows of the Great Spirit”) and refers to Lake Manitoba, the centre of which is almost one kilometre wide. The Cree are now by far the largest group of First Nations. The 135 state-recognised Cree tribes include around 200,000 people. They are spread over the largest area of any other indigenous people in North America.

**Outstanding support in North America: Pompaction Inc.**



Due to the size of the country, in Canada, Sales and Service are divided into the west and east. The Canadian Putzmeister dealer Pompaction, with its head office in Montreal, has up until now taken care of the eastern part of Canada, while Putzmeister America, based in Sturtevant, has been responsible for the western part. Pompaction has recently opened its first office in Alberta in order to expand the Service area and support PMA in the west.

hydroelectric plant projects, Muskrat Falls in the east and Site C Clean Energy in British Columbia. Pompaction has been working with Putzmeister for over 30 years in the sale of concrete pumps and mortar machines. With its three branches featuring a large spare parts store and modern workshop, North American customers receive excellent service.

Pompaction has experience with large projects in remote areas. In addition to Keeyask, Pompaction is currently in charge of two other large hy-

In the USA, Pompaction (known as Pumpaction) – with a sales office in Pittsburgh, Pennsylvania – is also the Putzmeister Solid Pumps dealer.

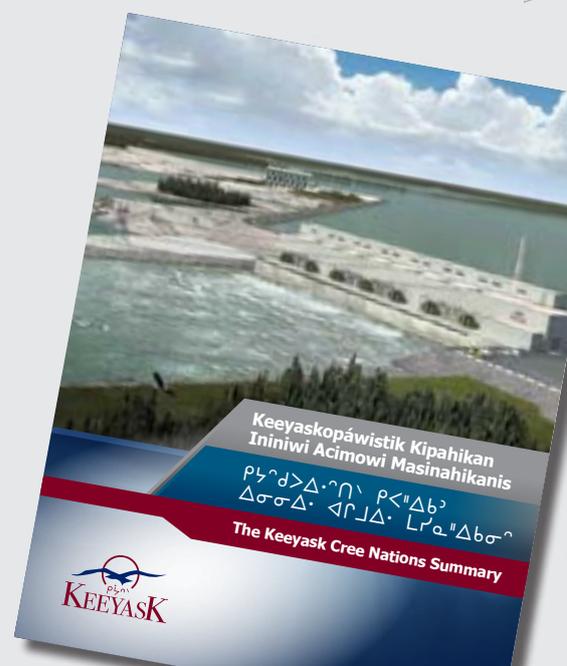
Over 100 employees work for Pompaction in Canada and the USA.



The four tribes of the Keeyask Cree Nations decided to support the project for the well-being of current and future generations. For many years, the Cree had experienced how the land of their ancestors was destroyed by hydroelectric power projects. They therefore decided right back at the end of the 1990s to take an active role in the planning and design of new projects. After long negotiations, the Keeyask Cree Nations and Manitoba Hydro signed what is known as the Joint Keeyask Development Agreement. This specifies, amongst other things, that

the Cree – with their experience and their knowledge – will investigate the impact of the project on the environment themselves.

Over the centuries, the Cree lived according to principles which we now refer to as “sustainable development”. With the Joint Keeyask Development Agreement, they want to find a way to maintain their way of life and their relationship with the earth for themselves and their descendants, even if projects have a negative impact on their land, life and livelihood in the short term.



# Clean solution: Reliable and economical sewage sludge incineration since 24 years at the Steinhäule/Ulm sewage treatment plant

In 1993 a Putzmeister KOS piston pump pumped hot sewage sludge in the Steinhäule sewage treatment plant near Ulm/Neu-Ulm for the first time. Today – 24 years later – the Putzmeister technology currently operated on-site includes 8 KOS pumps, 2 receiving bins, 2 storage silos each with discharge equipment, several hundred metres of high pressure delivery lines including fittings, metering valves, lubrication injection systems etc.

Several communities around the cities of Ulm and Neu-Ulm with their roughly 440,000 inhabitants belong to the catchment area of the "Steinhäule sewage treatment plant" administration

▼ Every year up to 60,000 t of external dewatered sewage sludge is hauled from the surrounding communities

body. Every year around 40 million cubic metres of wastewater flow through the mechanical and biological treatment stages of the sewage treatment plant on the Danube. Finally the waste water results in approximately 1 million cubic meters of raw sewage sludge.

After the dewatering process approx. 40,000 t of sewage sludge are remaining. Additionally to that the plant is receiving about 60,000 t of external dewatered sludge per year.

Sewage sludge was first disposed in a mono incineration in 1973. The sludge with a dry matter content (dry solids) of roughly 20 % made its way directly into

► KOS 2180 below one of the two receiving bins



the fluidized bed furnace via the trough chain conveyors. Sludge with these dry solids does not burn by itself. One million litres oil had to be added to the furnace every year to keep the incineration going. Incredible in modern times.

In 1979 a second furnace was installed and in 1986 the sewage treatment plant received a drying plant. Soon after that the first Putzmeister pump was delivered to the plant. When Erwin Schäfer, who has been the manager of the incineration plant for 22

years, is asked about the advantages, he spontaneously says: Closed system. High availability. No more sludge adhesion.

Putzmeister technology convinced him. As it was planned to receive external sludge from neighbouring districts in the future,

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▲▲ **Innovation for maintenance:**  
The KOS is simply swivelled out on plates installed on the ground

▲ **A crane device is fitted over the pump**

▼ **The hot sludge department: Two KOS 1070 HP LIB and one KOS 1040 HP LIB under the three dryers convey the 65 to 70 °C hot sewage sludge**

Putzmeister carried out pump tests. Since 2007 up to 60,000 t of external sludge is incinerated every year in addition to the on-site sludge.

The current capacity utilisation rate of the plant is very high. The plant is utilised in three shifts, 7 days a week. Schäfer added that he has enough requests for sewage sludge reception. The operation is economically successful. Another sewage sludge line is to be built by 2021.

According to Schäfer, a major topic is the reduction of energy requirements. Attempts are made to add as little fuel as possible during the incineration process. Today only 150,000 litres of oil are required every year (compared to almost 7 times this amount previously). One reason for this is the considerably dryer sewage sludge. It self-combusts from a dry solids content of 40 %.

750 to 1,250 kW of power is generated in the steam turbines from the heat of the two fluidized bed furnaces.

Significantly more sand enters the plant with the high proportion of external sludge. This causes increased wear, particularly as the sludge pumped today is dryer. This means that the wear sleeves of the delivery pistons are replaced every 2,000 hours. With a total of 8,500 operating hours per year this equates to 4 service operations.

The on-site sludge which is mechanically dewatered with centrifuges has a significantly lower sand content and requires much less maintenance: The wear sleeves of those pumps are having a lifetime of approx. 4,500 h. The pumps are installed throughout with sufficient space. The hopper is easily accessible thanks to a simple and clever solution: The bolted connections of the adapter and the feeding screw conveyor are slackened and the pump swings out on its



### Steinhäule sewage treatment plant association

The Steinhäule sewage treatment plant association was set up in 1984 and its members include 11 towns and communities around Ulm/Neu-Ulm in Southern Germany. It currently employs around 50 people. Around 40 million cubic metres of wastewater are cleaned and treated there every year.

frame around a fixed pivot point by 19 °. The KOS is positioned on plates which are assembled on the ground especially for this purpose.

In order to pump the sewage sludge safely through the delivery lines – the longest distance is 55 m from the large silo to the dryer –, a polymer is injected at certain points via a Boundary Layer Injection (BLI).

The constant modernisation and expansion of the Steinhäule sewage treatment plant ultimately affects the quality of the final result of this process: The ash. Around 7,500 t of ash are generated every year from the burned sewage sludge. 99 % of the phosphorous remains in the ash as a result of the thermal recovery.

"Our ash is so good", explains Erwin Schäfer, "that we can deliver it directly to a manufacturer, who mixes it with limestone to produce fertiliser for agriculture with a phosphate content of 6 %." It complies with the values of the

currently applicable European fertiliser ordinance.

The key word is phosphorous: Compounds made from this chemical element are essential for all beings. As the availability of phosphorous is limited, efforts are made to achieve the most efficient recovery, for example from sewage sludge. With the so-called co-incineration of sewage sludge, e.g. in coal-fired power plants, phosphorous cannot be separated economically at the end, unlike with mono incineration. It avoids harmful substances and has a high potential during the recovery of phosphorous.

The team at the "Steinhäule sewage treatment plant" is optimistic about the future with regard to the economy of the plant and the contribution to a cleaner environment. Not least thanks to the reliable Putzmeister system technology in sewage sludge incineration. ■

### Fluidized-bed combustion

In Germany stationary fluidized-bed combustion is mainly used for the mono incineration of sewage sludge. It is considered the most tried-and-tested large-scale method. Combustion air causes the sand to flow through the combustion chamber and keeps it suspended (fluidized). This ensures a high momentum and heat exchange with the injected fuel sewage sludge.

The combustion temperatures in the fluidized-bed combustion are between 850 and 950 °C. The arising ash has a low particle size and can be discharged from the system via the exhaust system and cleaned as standard.

[Source: Innovative process for sewage sludge treatment – A selection, Jörn Frank, Ralf Wittstock]

An adsorptive cleaning process follows the mechanical and biological stage which eliminates organic contaminants and impurities, i.e. bacteria, viruses and so-called micropollutants such as pharmaceutical residues, hormones, chemicals or pesticides. Activated carbon particles added to the wastewater bind these harmful substances to their large surface and the harmful substances can be filtered out.

At the end of the biological cleaning stage the sludge is separated from the water in the secondary settlement tank. Since 2015 the water from here enters the adsorptive cleaning stage, before it is finally fed to the Danube.

The sewage sludge is then processed for thermal recovery, i.e. drained, dried and then incinerated.

80,000 to 150,000 cubic metres of water must be cleaned every day. The process from the supply of the wastewater to the discharge of the clarified water into the Danube takes approximately 10 hours. The river itself would require 10 days with its self-cleaning capacity.

## 2:0 to the EstrichBoy in Leipzig's main train station

While the UEFA European Championship was taking place in France, a beach soccer court was installed in the east hall of Leipzig's main train station and, from 11th to 25th June 2016, teams interested in this variant of football could use it free of charge.

A campaign of this kind – which is not an everyday event – required flexible and creative solutions since station halls are not, by nature, oversized sandboxes. The organisers, the responsible centre management, presented this problem to Stein in Bennewitz – a company specialising

in all screed and ancillary work from the greater Leipzig area with whom they had already worked together successfully in the past.

### 53 tonnes of quartz sand had to be moved

The plan was to carry out the work after 10 p.m., after the shops in the station hall were closed, in order to keep the impact on business at the train station and on visitor traffic to an absolute minimum. This is why a decision was made to use an EstrichBoy EC 450 BS. This Estrich Boy – the tried and tested Brinkmann Original – is fitted with an environmentally friendly electric motor which is emission-free and low-noise. With a mortar hose NW 50 approx. 60 metres long, the required quantities of quartz sand could be transported directly to their location in the time-honoured station hall.

The decision to transport the sand using a compressed air conveyor proved to be spot on. Since the sand was kept damp when used as a football pitch, the normal “plug conveyance” principle could be used for the subsequent task of pumping the sand back out of the hall. Where required, the “mixture” was simply made a little more supple by adding several litres of water.



The high pump output of the EstrichBoy and fact that it can be quickly filled by the scraper ensured that the pitch was in tip-top condition again right on time for the morning rush hour. And the sand from the station is now providing a great deal of fun on a children's playground in Leipzig.



## Beachsoccer

is a variant of the game of football that is played on sand or on a beach.

The Beach Soccer Worldwide (BSWW) organisation arranges numerous tournaments, such as the Beach Soccer World Championship, which has been held twice a year since 2005 as an official FIFA (International Federation of Association Football) event.

The game is played by two teams comprising five players each (four field players and one goalkeeper). It is played barefoot on a sand surface – only elastic foot and ankle bandages are allowed.

The teams change sides after every period of the game, whereby there are three twelve-minute periods. In the event of a draw, the game is followed by three minutes of extra time. If the score is still level at the end of extra time, a penalty shoot-out takes place.

[Source: wikipedia]

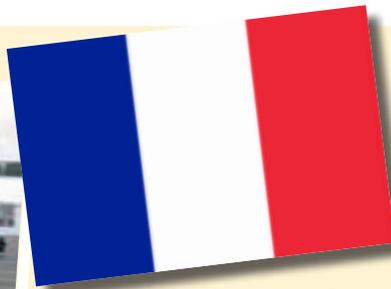




**Munich beer festival in Melbourne**

The long-standing Putzmeister dealer CPE Machinery celebrated a true Munich beer festival (known in Germany as the “Oktoberfest”) attended by a large number of customers and representatives of its suppliers with brass band music, beer and German food.

This was just one of the reasons for the Australian concrete pump provider to come to Melbourne. The latest mobile and stationary concrete pumps were presented at the CPE open day and, on the following day, the annual Concrete Pumper’s Expo took place – an event organised by the Australian Concrete Pumping Association.



**Open House at Putzmeister France**

On 7th October 2016, Putzmeister France organised an open house event for its customers. After a presentation of the machines – the BSF 47-5 truck-mounted concrete pump, the new PUMI 25-4, concrete pumps in the 20-m class, stationary pumps and the P 9 G UL truck mixer – visitors could enjoy specialist training and, of course, delicious food.

After a successful open house day attended by over 70 customers and a great deal of positive feedback, Putzmeister France is looking forward to upcoming events in 2017.



**All in all, a great success –  
the 2016 roadshow**

In November 2016, the BSF 47-5 truck-mounted concrete pump, the new PUMI 25-4 S and a P 9 UL truck mixer spent two weeks on the move visiting the German Putzmeister branches and the dealer Robert Aebi in Switzerland.

Over 350 customers from Germany, the Benelux countries, Denmark and Switzerland visited Putzmeister “on the road”.

While the weather at the start of the tour was unsettled and typical for November, customers from Switzerland and Liechtenstein were pleased to see the sun – and of course the benefits that the latest generation of Putzmeister machines can offer.





# The Shotcrete blog: bestsupportunderground.com



## What's behind this? Concrete technology explained in simple terms

**An example: Plasticizing admixtures. They keep things moving**

A family of polymers makes sure that the concrete keeps flowing: Plasticizing admixtures and super-plasticizing admixtures. They reduce the water to cement ratio so that the concrete becomes a more fluid consistency without thinning the mixture too much with water.

You can find out everything you ever wanted to know about concrete technology in the regular Putzmeister Underground blog posts.

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