New pumping record in North India’s Himalaya

New standards for truck-mounted concrete pumps: 42-5

New railway tunnel in Vienna: Long distance concrete delivery in the Lainzer Tunnel

New runway for Germany’s largest airport: Large boom pumps concreted taxiway bridge

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In brief

Caution: Snappy ad!

M 52 approaching the Hoover Dam bypass bridge

Large project in Saudi Arabia:
King Abdullah Financial District

Telebelt reduces the costs of placing mass concrete in Chinese shipyard
The Lainzer Tunnel is a railway tunnel in Vienna that is 12.8 km long and, from December 2012, will connect the Westbahn (western railway) with the Südbahn (southern railway) and the Donaulände-bahn railway. The purpose of this plan is to increase the capacity of the east-west transit system.

The tunnel starts at the Wien-Hadersdorf station and runs below the Lainzer Tiergarten to the west of Vienna, from Spessing close to the existing junction line and, at its mouth, joins the Südbahn line before Wien-Meidling station and the Donauländebahn line in Altmannsdorf. It is part of the Westbahn and the European High-Speed Line between Paris – Budapest.

The LT 31 consortium (HOCHTIEF Construction AG, Alpine Bau GmbH and Beton- und Monierbau GmbH), under the leadership of HOCHTIEF Construction AG, was commissioned by the ÖBB-Infrastruktur Bau AG to construct a main section of the Lainzer Tunnel.

The concrete mixture was designed to meet specific structural and pumping requirements and was subject to continuous monitoring from a concrete technology perspective throughout the duration of the construction project.

The interior construction of the tunnel was performed using a watertight concrete inner shell (d ≥ 50 cm), with PP fibres added to the concrete in order to improve its resistance to fire. In addition, the inner shell was designed with an 8 cm enlarged concrete covering of the reinforcement (reinforcement proportion of the tunnel lining is approx. 85 kg/m³ of concrete).

The formwork carriages for each segment of the tunnel were 10 m in length, resulting in an installation quantity of approx. 130 m³ of concrete for the tunnel lining of each concreting section and of 90 m³ for the base.

The interior work had already commenced in parallel to the headwork, and the concrete was fed via two vertical starting shafts. It was therefore decided at an early stage to supply the concrete for the formwork carriages using a stationary concreting facility – consisting of a stationary concrete pump and a specially designed delivery line. As a result of the positive experience gained from the beginning, this form of concreting logistics was maintained even after the headwork was completed. In the construction phases S and M, one delivery line each was available for the base and the arch for the concreting logistics. As a result, up to four formwork carriages could be filled with concrete in parallel. In this way, concreting outputs of up to 500 m³ per day with reinforcement work running in parallel could be achieved. This had the positive effect that restrictions and obstructions in the tunnel could be elim-
A hose was branched off from the delivery line and fed the BSA 1408 E at the arch formwork carriage.

Compressive stress peaks in the formwork carriage A P 715 fine concrete pump was available for the concreting of the cross cuts.

Cleaning

The DN 150 delivery line was cleaned by using water to force the concrete residue out in a "forwards" direction. Depending on the length of the line, this work was carried out by a BSA 2109 H D or a BSA 1409 D. "Forwards" water cleaning is usually selected for relatively long concrete delivery lines in order to prevent large quantities of concrete residue from forming. A replacement pipe is then equipped with a media separation system in order to separate the concrete from the water when the concrete residue is being forced out and, after the concreting process is complete, it is put in use directly behind the stationary pump. The replacement pipe mentioned above is usually fitted with a combination of sponge balls and wash-out pigs. Suitable media separation systems must be configured depending on the concrete delivery line installation. They are an important part of the delivery line planning to ensure the availability of the stationary concrete delivery facility.

Concrete

A tunnel section of 20 tunnel segments, each 10 m long, was produced from a self-compacting concrete (SCC). For this purpose, the Pony Infra GmbH (MVA Strass) laboratory developed a concrete mixture that was specifically formulated for this delivery process. The mixture breakdown of the SCC/WDI/BBG concrete (see the concrete composition table), had to meet the requirements for a construction that is dense (WDI), fire-resistant (BBG) and self-compacting (SCC), and it also had to represent an economically attractive solution for the execution. From a structural point of view, a grading curve with an increased sand content (70 %) and a reduced maximum particle size GK 16 mm round grain was selected. With a binder content of 280 kg/m³ CEM I 42,5 R (C3A-free) and the addition of a type I additive (AHWZ - Effective Additives Prepared Hydraulically) of 170 kg/m³, a fines content of over 340 kg/m³ was prepared PP fibres with a short fibre length (3 mm) were added in the dosage described in the table. Consistency tests on the fresh concrete showed a diameter of concrete flow of 58 cm with very good fluidity and sufficient self-compaction.

In the next part of the construction project, Putzmeister systems engineering was also used for construction phases S and W, with a total of six stationary concrete pumps, delivery lines and functional elements. This was not just because of the design of stationary concrete pumping technology which balances economical and technical factors but also because of the outstanding local-service provided by the Austrian Putzmeister dealer, Hans Eibinger GmbH.

The formwork carriage at the front is the base formwork carriage. The prepared steel reinforcement can be seen at the end of this carriage.
Revolutionary! The next generation of the 42-5

Fifty years of experience in the development of concrete pumps means innovations time and again. These innovations revolutionise the pumping and delivering of concrete. This is always based on the tried and tested, robust concrete pumps from Putzmeister, which are constantly being improved upon and adapted to meet modern demands.

With the 42-5 from the new generation, we have gone one step further: We took the basic idea and then completely rethought and redesigned it. Countless suggestions from customers, operators, suppliers and Putzmeister employees have flowed into the project. From this emerged an innovation that is setting standards on the market.

No fear of the scales
The resulting new design, from the boom tip to the base structure, makes a gross weight of less than 32 t possible, incl. sufficient reserves for payload, equipment, water and fuel.

Better in every respect
The concept for the new 42-5 was completely revised and scrutinised, always with the operator in mind. The 42-5 has gained increasing importance when it comes to operation, safety, operating costs and service in particular.

Calculated and tested
All essential components have been calculated using modern methods. Extensive field tests verify the maturity and reliability of the machine.

Service-optimised and easy to retrofit thanks to the screw-fitted pipe bracket and exclusive use of standard delivery line bends. For example, only three types of standard delivery line bends are now used, whereas seven types were used in the past.

The fluid cooler that is integrated into the support leg ensures optimal cooling of the hydraulic fluid, even in OSS operation.

www.theneew42-5.com
The new 42-5

Between June and the end of October 2011, two machines from the new 42-5 series are being used almost every day. The tours are passing through South Tyrol, Switzerland, Austria, Germany, Finland, Sweden, Denmark and Luxembourg. From September, a 42-5 will also be on the road to construction sites in the hot climate of Qatar. This is a particular hardiness test for the machine because, in addition to the demanding climate conditions, very difficult concrete mixes will also put to the test the machine’s suitability for daily use.

Pay no attention to external conditions. During a field test, all types of construction sites are in operation: Bottom plates, walls, decks, tunnels, etc. Only the width testing finally shows the machine’s comprehensive reliability when used in practice at a later point.

All field test machines are equipped with a wide range of sensors which monitor the hydraulic system and many other functions. Regular inspections deliver results mainly regarding the mechanical condition of the machines. This and, most importantly, the feedback from the machine operators are incorporated in the optimisation phase, with the aim of being able to offer a product at the start of series production that has been completely field-tested.

What do the people who work with the new 42-5 have to say?

“I particularly like the steady boom – also, the machine as whole works very smooth during pumping.”

Uwe Fischer, a3 Beton, Switzerland

“The machine moves with agility on our windy, mountainous roads. The low weight and the short wheelbase are perfect for this. Putzmeister has done a very good job – you can sense the high quality of the machine.”

Hans Karl Huber, Rienz Beton, Italy

“I like my old 42-5, but the boom on the new 42-5 moves superbly. Above all, it responds really well to the controls.”

Ville Sinko, Transinko Oy, Finland

“I really like the machine – and not just the look of it. It is somehow elegant. All of the parts are easily accessible and Putzmeister even had us machine operators in mind with their accessories. I would love to be able to keep this test machine for myself.”

Volkmar Spies, Die Pumas, Germany

"I would love to be able to keep this test machine for myself."

Volkmar Spies, Die Pumas, Germany

The new Ergonomic Graphic Display clearly displays all of the relevant data for the machine. Shown here: Overview of the system status and fault management.

Water tank with 800 l capacity (as standard).

The sponge ball is always accessible in the container.

Delivery notes are stored securely in the watertight, lockable docubox.

The field test with two new 42-5: On the road for five months.

Uwe Fischer from "a3 Beton" went for a test drive with the new 42-5 in Switzerland.

"a3 Beton" went for a test drive with the new 42-5 in Switzerland.
What does Putzmeister do against wear and tear?

Chippings arise when planing. And wherever concrete flows, scratches arise from stones - extra hard coatings and double-walled conveying pipes ensure that the wear and tear is kept within reasonable limits.

The material suffers wear where concrete flows along machine elements – in the concrete hopper with pipe branching, at the mixer, in the pump and especially in the conveying lines. This is what we call sliding abrasion.

“How many cubic metres does your line hold?”, customers ask regularly. That depends on what type of concrete is used and how much is being conveyed. Wear mainly depends on the type and distribution of the aggregates (particle-size distribution curve), the proportion of the binding agent (cement and/or quick ash), the water/cement ratio (water/cement factor), as well as the shape, hardness and porosity of the aggregates.

In Germany alone the degree of hardness of the aggregates differs depending on the region between factor 15 – 20. With so-called “ball bearing concrete” comprising soft rounded gravel, one can pump a good 60,000 cubic metres per hour. If one pumps concrete with extremely hard, broken material in the same line, then the concrete line can only stand approx. 4,000 cubic metres.

High-tech metallurgy controls wear and tear

To minimise sliding abrasion, Putzmeister concentrated on specially hardened conveying pipes from early on. Today there are conveying lines with two layers. They comprise an outer pipe and an inner pipe made from highly resistant material.

Armoured elements last longer

The components of the concrete pump are also armoured: A multi-layer special coating made from chrome protects the conveying cylinders which are particularly prone to wear and tear. With this coating Putzmeister guarantees a pumping quantity of at least 100,000 cubic metres – also for the most aggressive concrete mixes. The pipe branching where the cross-section of the concrete flow is reduced and wear and tear is particularly high, comprises a highly resistant special cast steel or is armoured with highly resistant steel facing.

Data and technology enable the wear and tear to be calculated

Putzmeister developed a database to calculate the wear and tear. It contains information on the wear properties of aggregates in many regions all over the world. As the wear is also dependent on the pumping speed, the concrete pump measures the strokes per operating time and thus calculates the average pumping performance. Reliable statements on the wear-resistance of components can therefore be made – provided the customer always pumps concrete with the same wear properties.

Leader thanks to low wear costs

Putzmeister products suffer notably less wear and tear thanks to the implementation of many measures. The wear costs per cubic metre of concrete amount to 40 – 60 cent for the entire machine. Many customers undercut this value by pumping slower, resulting in reductions in wear and tear and energy consumption. In the meantime, the computer-aided concrete pump control supports operators in the wear-reducing operation of machines with the “Ergonis® Output Control (EOC)” function for example. Thanks to the wear measurement data and the tele-service the wear and tear can also be monitored remotely. The data shows when it is time to replace a part. The Ergonis® control systems from Putzmeister thus permit preventative maintenance.

Hard metal wear parts

The parts of a concrete pump which are in direct contact with the generally strong abrasive medium are subject to a variety of wear conditions:

- **Sliding abrasion** on both contact surfaces of the wear parts
- **Blast jet wear** on the outer edges of the wear ring and inner edges of openings on the spectacle wear plate
- **Impact stress** at the parting plane, between the spectacle wear plate and wear ring
- **Flow abrasion** on openings of the spectacle wear plate and ring

The parts of a concrete pump which are in direct contact with the generally strong abrasive medium are subject to a variety of wear conditions:

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- **Flow abrasion** on openings of the spectacle wear plate and ring

Hard metal wear parts increase the service life of the concrete pumps

Hard metal wear parts comprise a basic body (structural steel) and an approx. 5 mm thick hard metal wear layer.

Hard metal wear parts have been available from Putzmeister for approx. 20 years. Different versions of hard metal wear plates have been developed and used from years of experiences with extreme applications in concrete conveying (e.g. Burj Khalifa).
DIE PUMAS Betonförderung GmbH & Co. KG is domiciled in the Rhine Main area with 30 truck-mounted concrete pumps with boom sizes of 24 to 63 m and stationary concrete distributing systems. Some of the longest distributing booms of PUMAS were used in August and September 2010 in the large concreting work on the taxiway bridges at the Rhine Main Airport. The two taxiway bridges lead over the motorway and ICE line and connect the new North West runway 07L/25R to the current airfield. The new landing strip should be in operation for the 2011/12 winter flight schedule. The first sod was turned in May 2009.

Expansion at Frankfurt Airport: Large concreting work of taxiway bridges for the new North West runway

West taxiway bridge – concreting August 2010

The West bridge was able to be concreted efficiently and on schedule thanks to the exact planning of the locations by four Putzmeister large boom pumps. The superstructure was tackled with a M 63-5, a M 62-6 and two M 58-5 on 20.08.2010 at approx. 20:00. Within 20 hours 3,240 m³ of concrete was placed, which was made available in due time by the suppliers Sehring Beton GmbH & Co. KG.

The precise planning of the locations was fundamental so that the work areas of the large boom truck-mounted concrete pumps could be met. A M 58-5 and the M 62-6 were used on the north side and a second M 58-5 and a M 63-5 were on the south of the taxiway bridge.
The second machine on the south side, a M 58-5, had to be set up in the crane runway.

East taxiway bridge – concrete September 2010

After weeks of planning, the superstructure of the East taxiway bridge was concreted on 17.09.2010. A M 62-6, a M 58-5 and a M 52-5 were used on the north side, as well as a M 63-5 and M 58-5 on the south.

The superstructure with a width (E-W) of 345 m and a depth (N-S) of 91.5 m was divided into three concreting phases. Work began on the deepest part of the structure where the ICE line and both sides of the A3 motorway run.

In the planning stage an placing period of 61.5 hours and a volume of 10,100 m³ were assumed. The guarantee of an uninterrupted concrete supply from four placing crews by the concrete pumps from PUMAS was the main requirement for the possible first smooth concreting of almost 19,000 m². As despite the use of large boom pumps there was still a gap in the work areas of the placing booms, a rotary distributor served to tie the work areas together.

Neat parking: The M 52-5 found a suitable and secure installation site at the ICE line thanks to OSS.
Expansion for more flights at Europe’s third largest airport

(Source: Ausbau Aktuell, March/2011)

In January 2011 the focus was on the excavation work for the dams for the taxiway bridges. To avoid pressure from the dams on the abutment walls of the taxiway bridges, which lead over the motorway and ICE line, so-called earth pressure traps were positioned.

The concreting work for the 45 m wide and 2,800 m long runway is continued. The "completed" ones began with the concreting of two layers, each 11.25 m wide, in order to complete the missing part within 24 hours. The concreting work for the flight operation areas (runway and landing strips) will be completed by the end of May 2011. As soon as the work on the dams is complete, concrete will also be applied to the taxiway bridges. The aim is to also complete the full five bridge structures by May.

The commercial airport Frankfurt am Main is by far Germany’s largest airport and, at the same time, is one of the world’s most important aviation hubs. Measured in terms of passenger figures it is the third largest airport in Europe after London-Heathrow and Paris-Charles de Gaulle and is number 9 in the world.

After the airport in Paris, it has the second largest volume of cargo out of all European airports.

The new runway should make possible a coordination benchmark figure of 126 flights per hour at the airport in Frankfurt.
The Putzmeister project team after the successful concreting.

A stationary concrete pump, type BSA 1409 D from Putzmeister, created a new record in December 2010: 1100 m in a tunnel is to date the widest distance achieved in India.

The tunnel – 3 km long and with a diameter of 2.50 m – is part of the Bhilanga-na III hydro power plant with capacity of 24 MW. The power plant is located in Ghuttu, Tehri Garhwal, in the north Indian state of Uttarakhand.

With regard to the land, the project was a huge challenge for all concerned. The entire concreting logistics were developed in Ghuttu – the last point that can be reached by road at the Bhilangana River. Detailed planning, from a suitable installation site for the pump to the laying of the pump line and mounting the casing, was essential for ultimate success.

The concrete pump was set up against the pump direction for more stability. From the hopper outlet the pump line continued initially over two 90° elbows, which reduced the transfer of the pressure in the line to the pump. The pump line was screwed to the concrete bases using U-shaped supports. A shut-off valve in the delivery line prevented the...
backward flow of concrete and water as the tunnel pipe continued on diagonally and had a downward slope against the concrete pump. A specially produced concrete block over the pump line before the tunnel entry detected the force of the pump.

The tunnel concreting required a continuous pumping process of 105 m³ of concrete of strength class C25 into the 1,100 m distance. For the team, this meant concreting day and night, in sections of 67 m long for the roof and side walls and 70 m for the base. If the end of a casing section was reached, the base was then concreted in reverse direction. The concrete was placed using an elbow pipe. The thickness of the concrete layer was between 200 and 250 mm. The concrete mix was monitored constantly before and during concreting.

The concreting team were working in the tunnel around the clock.
As part of the “Wetfeet” project, preparation for the implementation of heavy bases for offshore wind power systems is currently underway. Here the wind power systems are to be manufactured completely on land with a concrete column and a concrete base and then transported to sea by a purpose-built ship. STRABAG Offshore Wind develops, designs and realises heavy bases for wind energy systems that are ready for use for offshore wind farms. Using a concept of complete standard system assembly on land, STRABAG offers decisive advantages here. With the completion of the new STRABAG terminal in Cuxhaven Offshore Wind is now able to undertake large-scale production.

STRABAG is investing over 300 million Euro in total in these manufacturing sites in Cuxhaven. Up to 500 jobs are planned to be created over the coming years as part of the initial development phase.

Wind power system is assembled fully on land

A special feature of the STRABAG logistics concept is the pre-assembly of the entire wind energy system, comprising steel tower, turbine and hub with rotor blades, on the heavy base in the production plant in Cuxhaven*, states Dr. Klaus Weber, Managing Director of STRABAG Offshore Wind GmbH. The 7000 ton system is then transported by a purpose-built ship to the wind farms. Thus offshore installation is largely independent of weather and sea conditions.

For installing a parts plant of this size – the factory grounds stretch over 50 hectares – many details need to be examined and tested in advance. As a preparation for the later series production and for the examination of loading at the base, a test base for such a wind power system is being manufactured in Cuxhaven. Concrete pumps are to be used for the efficient manufacture of bases. The high requirements of the properties of the concrete have effects on the pump behaviour. To test this, in the case of concrete pumping tests can be carried out and, at the same time, examinations of the concrete mix using a recently developed rheometer are performed by Putzmeister.

On an automatic concrete pump, type BSF 42-5.16HLS, the concrete pressure in the line behind the hopper has been measured. With this the pump behaviour of the special concrete C70/85 is analysed for conditions prevailing on the construction site.

Consistent measurements at the pump and using the rheometer have shown what properties the concrete has when pumping. As can be frequently observed with modern high-strength concrete mixes, this special concrete also generated relatively high pressure drag in the conveyor pipe. The properties determined through experiments help in the targeted and clever design of later pump systems. The examinations using the rheometer are offered exclusively as a service.

The continuous development of renewable energies in Europe is leading to a move to more and more wind energy systems being installed not only on land, but also in areas in the North Sea and the Baltic Sea.

In the late summer of 2009, the German government concluded a development plan, according to which by 2030 up to 25,000 megawatts could be generated using offshore wind power. According to the Ministry of Transport 30 wind farms are to be built in the North Sea and 10 in the Baltic Sea. Germany lies in second place behind the USA as the biggest wind energy producer.
Putzmeister Solid Pumps

for ship and offshore applications

The installed solids pump can be seen by the hopper’s white cover lid in front of the person. The auger feed device can be seen in the foreground.

According to Norwegian law, until 1991, drill cuttings were permitted to be dumped on the sea-bed, next to the bore hole. Currently, the threshold values for the residual oil content of drill cuttings, still stored at sea, are at one gram per kilogram oil. Exempted are cold water areas. For example, in the Barents Sea, there is a zero-emission limit value.

Loading these containers and tanks by crane on the supply vessels is a time-consuming task and risky in case of bad weather. In order to improve the loading and unloading tasks on the supply vessels, the conveyance of drill cuttings with the help of piston pumps and pipelines is very useful.

Ulstein Werft, one of the most innovative shipyards in designing special vessels for the oil and gas industry, has won the tender launched by Statoil in 2006 to build two supply vessels. Putzmeister was chosen to deliver the storage and pump system for the drill cuttings.

The reason for choosing Putzmeister’s system was the long-standing experience in the conveyance of different kinds of difficult flowing materials and also the successful drill cuttings pump tests done in 2007 and 2008.

Despite the scarce available space, the whole unit was able to be installed in the cargo department in a service-friendly manner.

Long years of experience in project business, great teamwork and co-operation with the Ulstein Werft’s ship building engineers, as well as a high level of expertise in project management were the factors that enabled us to comply with the delivery date, the project’s budget and the high standards set for ship building.

Both ships with yard numbers 288 and 289 were delivered on schedule to the company Remoy shipping, which has an 8-year charter agreement with Statoil. The vessels were named Rem Hrist (288) and Rem Mist (289).

Besides the storage and pump systems for drill cuttings, the supply vessels have a Multi Cargo Tank System for liquids and dry solids. Furthermore, on deck, they have approximately 1,000 m² of protected area for containers.

In case of an oil leak, like the one that happened with the Deep Sea Horizon, drill cutting tanks and the Putzmeister pump system can store and pump ORO (water mixed with oil).

In connection with these assignments, PSP service technicians underwent a special offshore security training of several days in Norway.

Technical data:

Scope of supply for each vessel

- 2 x sliding frame PDL 6845
- 2 x auger feed device SHS 4552 SH
- 1 x high density solids pump KDS 1480 HPS
- 1 x power pack HA 200 E-SP
- 1 x control cabinet SEP 200
- 1 x boundary layer injection unit 250/600

Technical key data – PSP pump system:

- Storage tank for drill cuttings 2 x 200 m³
- High density solids pump 50 m³/h, 60 bar

Technical key data – supply vessels:

- Total length 88,8 m
- Width 19,0 m
- Max. draught 6,0 m
- Design draught 5,6 m
- Net Tonnage 1328 NRT
- Gross Tonnage 3969 GRT
- Max. speed 15,4 Knots

Technical data:

- Depth of main deck 8,0 m
- Gross Tonnage 3969 GRT
- Net Tonnage 1328 NRT
- Design draught 6,6 m
- Max. draught 5,6 m
- Max. speed 15,4 Knots

The Valkyries Hrist and Mist

Come from the Norse mythology. Valkyries are female ghosts from Odin’s entourage and select fallen warriors that will reach Odin’s castle Asgard in the afterlife. Once there, they become so-called Einherjer.
Caution: Snappy ad!

“Since I have the eye-catching writing on my M 52, my customers are ordering nothing but the “Big Dog”, states Robert Heider, Managing Director of the concrete pump services Heider from Wolfgg im Allgäu. As he was in the area, he made a pit stop at the Putzmeister plant in Aichtal.

► Robert Heider (right) and Jörg Hermann, Manager of the Workshop Service Centre in Aichtal (left)

In the Putzmeister Post 79 we reported on the spectacular concreting at the double arch of the Hoover Dam bypass bridge which was effected in October 2009.

A year and a half later in April 2010 the bridge was once again the scene of an exciting event: A M 52 was “flown” to its airy workplace by cable crane.

A total of eleven fields, each 27 x 37 m, of the future road had to be concreted. Pump service providers Quinn from Las Vegas, who were assigned the entire project with regard to equipment and machine operators, were in demand with their M 52 as a semi-trailer. The large range was decisive in the choice, but also its semi-trailer configuration. The truck-mounted concrete pump was able to be “alleviated” with its tractive unit and positioned on-site on a special counterweight using a crane.

The M 52 was positioned at the peak of the arch. To distribute the load symmetrically and balance the bridge arch, it concreted one area on one side and then one area on the other side. Always rotating until all eleven areas were complete. The rotation of the pumps was necessary as the supply line from the stationary concrete pumps, which fed the M 52, would otherwise have been in the way.

The Hoover Dam bypass bridge has been in operation since October 2010 and is called the “Mike O’Callaghan - Pat Tillman Memorial Bridge”. The construction of the almost 610 m long bridge took roughly five and a half years.

The M 52 approaching the Hoover Dam bypass bridge
In brief

Large project in Saudi Arabia: King Abdullah Financial District

In the Saudi Arabian capital Riyadh construction has begun on the “King Abdullah Financial District” (KAFD). The ambitious project with a volume of 10 billion US$ will comprise more than 40 skyscrapers on an area of 1.6 million m² and should be completed within a construction period of just three and a half years.

“Saudi Arabia is to become the financial centre of the Middle East.” This proposal and the large personal interest of the head of state and government King Abdullah bin Abdulaziz Al Saud are helping the project to advance quickly and consistently. Construction of the first 10 of 40 lots began at the end of 2009; after only 30 months they should already be complete. The same short construction period is estimated for the other sub-projects. 70 % of the building should be complete by the middle of 2012.

The concept of the KAFD not only envisages exclusive offices for financial companies. Approximately one quarter of the 5 million m² building area is intended for residential apartments. Six hotels are planned, as well as numerous shops and leisure facilities. What is important for the builders is to create a pulsating city in the day and at night and to create a harmonious connection between work, living and leisure.

According to the principle of a “Wadi” – a Wadi describes a dry riverbed which contains water only during times of heavy rainfall – in the entire complex there are shaded footpaths with water features and plants, as well as lots of air-conditioned “sky walks” between the towers and a single-track rail around the districts. Each skyscraper has four underground car parks. Together with the complex traffic routing, the KAFD remains practically car-free.

The quantity of concrete required for the construction of 1.6 million m³ is gigantic – 2800 m³ should be used every day.

Putzmeister is helping with this project not only with reliable pumps and placing booms, but is also on hand to provide project advice.

Telebelt reduces the costs of placing mass concrete in Chinese shipyard

Titan Quanzhou Shipyard Co. in Hui’an, Quanzhou in the Chinese province of Fujian is part of the Titan Petrochemicals Group Ltd. The shipyard consists of a cofferdam, an outer quay and four dry docks. Dock 1 is the main shipyard and consists of the dock entrance, wall, foundation, passage, drainage system and pump house.

The project started in 2006 and the concreting work began in March 2010. The first and second docks are due to be completed by the end of May 2011. For the concrete placement, the main items of equipment being used are a Putzmeister Telebelt TB 110 G, three 12 m truck mixers and one 3 m span mixer. The Telebelt concretes the dock wall of the dock entrance and the pump house.

The dimensions of the docks

<table>
<thead>
<tr>
<th>Dock</th>
<th>Dimensions</th>
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<tbody>
<tr>
<td>Dock 1</td>
<td>380 x 80 x 14.4 m</td>
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<tr>
<td>Dock 2</td>
<td>420 x 68 x 14.65 m</td>
</tr>
<tr>
<td>Dock 3</td>
<td>280 x 66 x 12.8 m</td>
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<tr>
<td>and 4</td>
<td>each is 280 x 46 x 12.8 m</td>
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</tbody>
</table>

The perfect conveyor belt for the base plate of the dock

The foundation plate was 60 cm thick and the entire surface was divided into several segments, with each segment requiring 225 m³ of concrete. To construct this foundation, concrete had to be conveyed continuously. No problem: Telebelt operated without interruption for 67 hours and completed the job perfectly. The fuel consumption was measured during the placement. The result: 1,000 litres of diesel for 5,300 cubic metres of placed concrete.

Save money and time with the reliable Telebelt

Telebelt can convey concrete with a low slump and a relatively large particle distribution. Concrete mixers of this kind are mainly used as mass concrete because, on the one hand, they produce less hydration heat and, on the other, they are significantly less expensive than pumpable concrete.

As a result, they considerably reduce the costs for a project such as this one. In comparison to other methods of concrete placement, the TB 110 G has saved a lot of time thanks to its large output and high level of mobility.

Since the beginning of the concreting work, the Telebelt was extremely reliable to use. Except for scheduled service work, there were no downtimes during this time.

By September 2010, the TB 110 G had already placed 45,000 m³ of concrete and, by April 2011, it had pumped as much as 130,000 m³ on this shipyard construction site.

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