

Prinzing-Pfeiffer GmbH, 89143 Blaubeuren, Germany

Concrete giant in the Caucasus

One of the biggest and most ultra-modern concrete production facilities in East Europe was commissioned in Azerbaijan at the beginning of 2015. Even President Ilham Aliyev was guest at the opening ceremony in Sumgait for the inauguration of the new StarConcreteProduction (Star CP) production site. The facility had been constructed on behalf of Azersu, the state-owned stock company, whose specialists were responsible for technical planning and operational performance. Star CP (formerly Azkontakt) and Prinzing-Pfeiffer (Schlosser-Pfeiffer GmbH at the time of signing the contract) were able to implement this planning successfully. Star CP will not only supply Azersu with reinforced precast concrete components (pipes, manhole rings, manhole bases, cones) but will as well supply private companies who are engaged in constructing or reconstructing the water supply and waste water disposal systems in Baku, Sumgait and other towns of Azerbaijan.

Constructing the new concrete production facility was absolutely essential. In the next 12 to 15 years, a comprehensive development programme, concerning the water infrastructure in particular, will be implemented for all towns without exception in Azerbaijan. Besides manufacturing pipes, Star CP also supplies kerbstones and concrete elements, such as paving blocks, manufactured using the vibro-compaction process. The production facility's total area measures 12 ha and the operational area 11,000 m². Each year, 120,000 – 140,000 m reinforced steel pipes will be produced plus 500,000 m² concrete slabs.

Strong growth in Azerbaijan

The industrial history of Azerbaijan begins in the early middle ages with the extraction of mineral oil on the Absheron peninsula. Due to its rich mineral oil resources, Azerbaijan took on an important political and economic role after proclaiming its independence in 1991 on the Eurasian continent. The country has successfully overcome the difficult transformation time during the nineties of last century and has regis-

tered a continual economic upswing since then. GDP growth in the Republic of Azerbaijan was especially high (averaging 24.2% per year) between 2005 and 2008. The country boasted the highest economic growth in the world during that time. Azerbaijan contributes approximately two thirds to the total gross domestic product of all Caucasus countries. The country is quite rightly spoken of as the economic driving force in the region. Azerbaijan's ascendancy is a result of its economically liberal politics and cosmopolitan outlook. Special attention is paid to economic cooperation with the EU countries with a view to utilising their innovative technologies for their own country's economic development. The mainstay of this policy is very rapid growth in the construction sector, which occupies a special position within the context of the economy's overall modernisation. An extensive programme for constructing state-of-the-art construction material production facilities was carried through by order of the Azerbaijani President, and financed with favourable state-sector loans. A loan of 70 million manats was granted for the construction of 18 facilities with a total value of

186 million manats (1 manat = approx. US\$ 0.95). 14 new facilities are already in operation producing construction materials of the highest quality with the assistance of machines from leading European manufacturers.

Construction work begins

Sumgait, the third largest town in the Republic of Azerbaijan, was selected as site for the new facility. Sumgait had experienced its heyday as an important industrial hub quite long ago but is slowly regaining its renown as the major industrial centre in the Caucasus. In the vicinity of Star CP, new production sites are being set up for manufacturing carbamide, superphosphate and chemical additives for mineral oil products. The crown jewel of the Republic of Azerbaijan – the great multi-purpose Sumgait technological park – is located only a short distance away. The Ministry for Economic Development had made a building site "of national standing" available for constructing this Star CP production facility by the coast of the Caspian Sea on the premises of a former chemical factory. Old



Finished reinforced concrete pipes before delivery to customers



The new production facility halls were erected in a very short time according to specifications from Prinzing-Pfeiffer



Mr Ilham Hajiyev, general director "Star CP" and Mr Alexander Probst, regional manager Prinzing-Pfeiffer



The future "Star CP" production facility terrain during the first site inspection

production structures and the remains of the previous infrastructure still stood on the terrain. Some buildings were torn down and the building site newly developed. Renovating these premises and preparing for the new construction took much time and work. Besides production halls, office blocks were constructed with pleasant recreational and social rooms including a canteen for 150 persons. Right from the outset, the company's management devoted a great deal of attention to the interests and desires of employees. Everything was done so that employees would like to come to work, would feel good and be supplied with all they need. The new production facility was constructed in a very short time; it took only one year and eight months. Construction work began in the spring of 2013; the commissioning took place in January 2015.

The director general, Ilham Hajiyev, played a special role in constructing the facility. His visionary capabilities launched the birth of this production site, long before the first plans and calculations had been carried out whilst many still held the ultra-modern facility for Utopia. Where others only saw a run-down, ruined site, Hajiyev could already visualise the biggest concrete factory in Eastern Europe. Even now that the facility has been completed, there are still some who think it a fata morgana.

Machine selection process

In checking through all potential suppliers, the spotlight fell in particular on one of the leading manufacturers of concrete pipe machines in the world - Prinzing-Pfeiffer GmbH from Blaubeuren, Germany. In this respect, the Star CP engineers gathered an

enormous amount of information about its machines, concrete products and the company itself.

Mr Ilham Hajiyev, General Director of the production facility says: "One important argument in favour of Prinzing-Pfeiffer is its country of origin. We all know very well that German quality is ranked among the best in the world. There is a tradition in Germany of making robust and very reliable machines. This goes for cars, machine tools and all other systems."

"In our selection, consideration was not just given to the excellent standing of German engineering and information about Prinzing-Pfeiffer but to the opinion of colleagues as well. We had asked eight very large concrete pipe manufacturers what machines they were operating. The answer



The first production halls standing only 10 weeks after beginning construction



Prinzing-Pfeiffer Variant 3600/2500 for concrete pipes up to a 3,600 mm and lengths up to 3.0 m



Grab for turning pipes with products up to 15 tonnes in weight



Prinzing-Pfeiffer Variant 2500 during production

was that six out of eight companies had machines from Prinzing-Pfeiffer in operation. Conversations with colleagues from Russia and Saudi Arabia – both totally different countries – underscored the high reputation of Prinzing-Pfeiffer machines. Today, I can say from our own experience that our expectations have even been exceeded. More than six months after commissioning the facility, we are still very happy to have made the right decision at that time," says Ilham Hattiyev.

Facing the future

The Star CP production facility has been equipped with state-of-the-art technology from Prinzing-Pfeiffer and many other western companies. Besides the actual production system, the entire peripheral equipment, such as e.g. trucks, lifts, forklifts and cranes, has been sourced in Germany. Concrete mixing is carried on with the aid of two mixing systems from Prinzing-Pfeiffer. They are equipped with weighing and dosing devices for both liquid and dry admixtures and can cope with up to three types of cement simultaneously. Although the mixers have been set up for optimum operation with the current needs, they still have substantial productivity reserves for any subsequent increase in output. Retrofitting the concrete mixing machine with additional options for enlarging processing capabilities is also possible. Such options include additional automation equipment such as, for example, robots and dosing systems for metal fibres, admixtures or aggregates in manufacturing reinforced concrete elements with special characteristics.

A total of eight moulding stations were built. Steel reinforced concrete pipes – including

a polyethylene inner lining (inliner) if needed – can be manufactured with an internal diameter of 300 mm up to 2,500 mm at each station. One station can even manage pipes with diameters up to 3,600 mm and up to 3,000 mm long. A Variant 1500 is employed for producing manhole rings, manhole bases and cones. This system makes it possible to manufacture the above-named products with inner diameters up to 1,500 mm and heights up to 1,000 mm. Depending on the engineering assignment, manhole rings with a height of 300 or 600 mm can be produced alongside rings and cones measuring 1,000 mm in length. The Modulant 765 system can produce seating rings with heights from 40 to 250 mm that are needed for positioning covers. Metal reinforcement cages can be manufactured in any shape or size from 300 mm up to 3,000 mm with the aid of two large welding machines.

The gantry turning units with load-bearing capacities of up to 15 and 25 tonnes plus transport cars make for well thought-out production logistics. Their own fleet of vehicles made by Spezialtechnik consisting of 10 automated tippers, 10 concrete mixers, 2 stacker trucks and 4 trolley cars of differing tonnage guarantee that all products manufactured will be delivered on time.

Alexander Probst, the regional manager (Eastern Europe) of Prinzing-Pfeiffer GmbH, comments: "Specific technical requirements determined the choice and make-up of the systems. A wide range of products was specified as one particular objective. The Universal machines are well suited to this. Great importance was attached to being easily able to expand the facility even at the project stage for the system. This applies

to both the existing machines and to setting up new ones. To take but one example, an additional pit with a ready-made foundation and all the connections needed was prepared but the automated high-performance machine (200 rings per shift) foreseen for it will be installed at a later point in time. One enormous advantage for Star CP was being able to redesign the production facility from scratch without having to give heed to any existing machines or plant. This means that there were no limitations set to optimum machine and automation engineering or perfect production logistics from loading silos to removing the finished component.

All machines are computer controlled and automated, thereby both reducing human error to a minimum whilst also at the same time enhancing product quality. The automated processes include: producing the concrete mix, feeding mixes into the machines, controlling the compaction processes and the vibration table. Machine operators have only to manage the system and make corrections to the working process if necessary."

"We greatly appreciate our partner Prinzing-Pfeiffer not just as a manufacturer and supplier of first-class machines but also as a highly qualified engineering service provider. All drawings for the system including those for the machine foundations were prepared by the company's specialists. They supported us tirelessly in all work processes, no matter what they concerned: manufacturing reinforcement cages or welding polyethylene pipes. For us, as customers, it is very convenient to have to work together with only one company and source the entire equipment from one sup-

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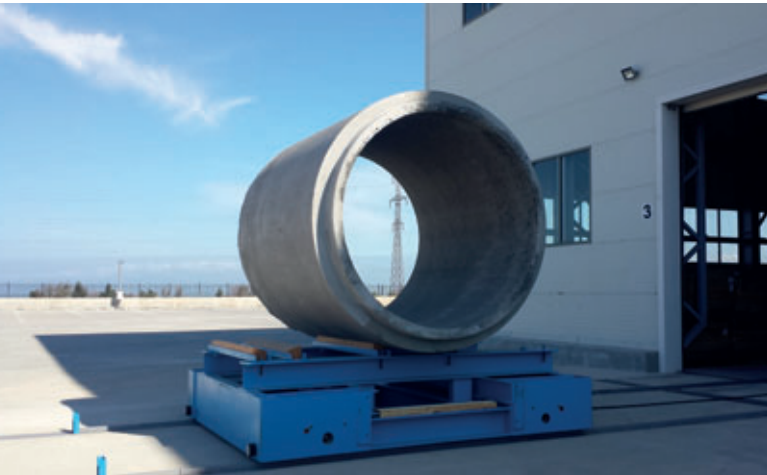
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Formerly **ZÜBLIN** Maschinenbau



The hardened pipes are transported from the hall with a transport carriage to the outdoor storage site



The "Star CP" show gardens for its concrete pipe and concrete manhole product range

plier. This supplier is both very skilful and very reliable as well. Prinzing-Pfeiffer employees were able to answer all our questions, even those we had not initially thought of. Although the deadlines were very tight, everything was completed on time, very conscientiously and in accordance with all our wishes. The German project manager, Mr Alexander Probst, was not just continually well informed about all matters; he was also often in Sumgait to solve problems on site. It is largely due to his work that the partnership relations between us and Prinzing-Pfeiffer are so good and that problems in understanding never cropped up in communication. Our skilled employees learnt how to handle these modern German machines very quickly, which was very helpful for their successful integration into our production ideology", comments General Director Hajiyev.

Customer image – highest quality demanded

Star CP customers fall into one of two categories: on the one hand, Azersu the government-owned stock company and, on the other, various participants on the market. Pipes with very large diameters are particularly interesting for Azersu. Private companies buy pipes with 800 and 1,000 mm diameters, i.e. mainly pipes, manhole bases, rings and cones. The production of kerbstones, paving blocks and other smaller concrete elements is mostly aimed at private companies. Nonetheless, even the products destined for other market players are monitored by Azersu and their quality checked before they can be utilised for projects. In addition, products employed in water supply facilities and sewer systems have to undergo stringent examination by

the Ministry of Emergency Situations. This is also why solely products of the highest quality level are in demand. In cases concerning town infrastructure, manufacturers are obliged to respect and to fulfil all standards with essential components, such as pipes, manholes, etc., no matter whether the buyer is a private customer or the state-owned company.

Ilham Hajiyev, general director of the Star CP production facility, remarks: "Good quality – is an indispensable prerequisite for working successfully on the market. Good quality is thus also the main priority for all employees at the Star CP production facility. Assuring the quality of our work begins by checking the raw materials and accessories (aggregates, cement, additives) and does not even end in the precast component storage area although the chain of technological processes may have been completed. Specialists from our facility and representatives of other organisations and state structures (e.g. employees of the Ministry of Emergency Situations and scientific institutions) test Star CP products "in-situ" - where they are used. This excludes practically every possibility of supplying defective products. A whole range of organisational and technical measures have been put in place for quality assurance. All employees down the line from hall managers to shift foremen assume great responsibility for quality assurance. The employees at the facility's laboratory make a major contribution to this. Cooperation with the Republic's leading scientific institutions also plays an important role in quality assurance and in answering incidental questions. Employees at these institutions, in the context of their research work or else working continually with the company, take samples of the products "under field condi-

tions", subject them to testing and then make their reports available to the facility management.

State-of-the-art equipment – new opportunities, cleaner production

A wide range of products, cost reductions, quality assurance, enhancement of productivity and operational performance are features of state-of-the-art equipment from the world's best manufacturers. At the same time, these features generate savings on energy, reduce environmental pollution and create user-friendly and safe working conditions. More than 200 new jobs were created by Star CP. This is sustainable, long-term support for the region.

Successfully expanding and opening up foreign markets are realistic goals for the future. Its unique technical equipment and production volumes allow Star CP to serve both the inland market of the Republic of Azerbaijan and to supply its products to the neighbouring countries – Iran, Kazakhstan, Uzbekistan, Turkmenistan, Georgia and southern areas of the Russian Federation. Demand for these products is very great, since local manufacturers can neither deliver the product range desired nor the required product quality. They include, for example, the pipes with polyethylene jackets or pipes for micro-tunnels with diameters between 2,000 – 3,000 mm. Great attention is paid to keeping the environmental laws of the Republic of Azerbaijan. Industrial waste water is cleaned very thoroughly, enabling part of the waste materials to be recycled. All cement silos are equipped with powerful filters; this is why the surroundings are not polluted with cement dust. The company also focuses strongly on personnel planning.



Finished manhole base components with formed inlets and outlets

Continuous training and ongoing education for employees of all departments is another stepping stone on Star CP's path to success.

Star CP: Unique project – unparalleled experience

The Star CP production facility – in terms of its size, machine volume and other parameters, still remains the biggest project that Prinzing-Pfeiffer GmbH has ever undertaken. There have been similar projects but the possibilities and perspectives of this project are really unparalleled. In Sumgait, a whole range of difficult technical challenges were successfully resolved, e.g.: manufacturing pipes with built-in high-density polyethylene (HDPE) and maintaining maximum output in manufacturing pipes of medium and large diameters for differing loading levels. The organisation of all processes had to be optimised progressively to be able to guarantee such performance. This means that the concrete mixer, the equipment for feeding and spreading the concrete, the machines for producing reinforcement cages, the technology for fabricating precast components, the turning device, etc. – no link in the chain of operations was too weak.

Mr Alexander Probst is of this opinion: "For our company, Prinzing-Pfeiffer GmbH – a company with more than 100 years' experience in working in many countries of the world – this project was a real challenge. Working together with Azkontakt was very important and extremely interesting for us. Now that this work has been completed, Prinzing-Pfeiffer GmbH wants to thank their Azerbaijani colleagues for their trust, for their all-round willingness to help and hopes that new projects can be carried out in the future."

The concrete production facility in Sumgait is proof of the possibilities and perspectives as regards economic development in the Republic of Azerbaijan and a statement of the country's enormous potential. It also gives an indication of the great success that can be achieved through modernising production infrastructure assisted by cutting-edge, innovative technologies and machines. ■

FURTHER INFORMATION

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