

■ Prinzing GmbH, 89143 Blaubeuren, Germany

Modern production of steel-reinforced concrete pipes and manholes in Russia

The Barrikada company is one of the leading producers of steel-reinforced concrete products in the North-West Federal Region. The company has six production works - four in St. Petersburg, one in the Leningrad area and one in Moscow.

The works are continually being modernised in order to adapt to the needs of the growing market and to remain competitive and retain the leading position in future.

The story began in 1907 with the opening of a workshop for the manufacture of cement pipes by the Andrey & Ellerss company. The company was renamed Barrikada on the fifth anniversary of the October revolution. Affiliation to the LSR Group took place in 2002, with which a comprehensive modernisation began, with the objective of improving quality, lowering costs, expanding the product range and increasing production capacity.

In order to achieve these ambitious goals, it was decided to purchase the machines and plants from companies who are amongst the technological leaders in their respective fields.

The Prinzing company was commissioned to supply the production plants for the manufacture of steel-reinforced pipes and manholes. The company, which was founded in 1862 and is still family-owned today, began manufacturing moulds for precast concrete parts in 1907. Today, Prinzing has a complete range of pro-

ducts for the manufacture of precast concrete elements for civil engineering that can be adapted to specific customer requirements.

The cooperation of the two firms was not just concerned with the selection of the machines and plant, but rather it was necessary to design the steel-reinforced concrete pipes and manholes to suit market conditions and to develop them further.

Mistral Pipe Machine for steel-reinforced concrete pipes and manholes

Prinzing's range of products for the manufacture of pipes and manholes comprises several machine series (Atlas, Pegasus, Mistral), which offer specific advantages for the respective usage case. Hence comprehensive discussions and also inspections of reference plants were necessary

in the run-up to ordering. Building site inspections were also carried out in order to determine the requirements for the optimum implementation of the pipes and manholes. In this way it was possible to analyse the production and storage in the works, the transport to the building site and the subsequent installation of the precast concrete parts on the basis of practical examples.

The Mistral Pipe Machine was chosen for the production of steel-reinforced pipes in an overall length of 2500 mm and manhole elements in overall heights of 300, 600 and 900 mm. The pipes, in nominal



Stable steel cages for the pipes and manhole rings, produced on a new wire-cage machine from MBK

Double production with two different nominal diameters per cycle

diameters of 250 to 600 mm, are thereby manufactured in double-production with combined implementation. In this way it is possible to manufacture two different nominal diameters per cycle and hence reduce expenditure on moulds and base forms. Pipes in the nominal diameters 700 to 1200 mm are produced individually, as are manhole rings in the nominal diameters 1000 mm and 1500 mm.

In order to secure the highest standards with respect to concrete strength and the dimensional accuracy of the concrete pipes and manholes, the following methods and devices are integrated in the Mistral Pipe Machine, based on Prinzing's decades of experience and development: frequency-regulated, oil-lubricated central vibrator; frequency-regulated superimposed load vibration; GEBA method for exact overall length; double conveyor feed for single and double production of steel-reinforced concrete elements.

The conversion times from single to double production and from pipes to manhole

rings are minimised by hydraulic mould core and mould jacket clamping. The telescopic presses and central vibrator are driven electrically. The high operating reliability and long service life of Prinzing plants are due to the use of very high quality components such as Bosch Rexroth for the hydraulics, Siemens S7 for the menu-driven controller, the Siemens Profibus system for the data transmission and absolute odometry system for all main movements. The user-friendly control panel with menu-driven operator interface can be turned in all directions. All parameters relevant to production, such as times, speeds and rotational speeds, are saved specifically for each product.

The first Mistral Pipe Machine was installed at the beginning of 2006 and put into operation after a short time. The base forms and reinforcement cages are inserted manually in this plant; the parts are removed by the electric transport wagon. Due to the very rapid increase in the sales of pipes and manholes, a second Mistral Pipe Machine was installed at the begin-

ning of 2007. In order to further increase efficiency, this plant is equipped with the following components: spigot magazine; spigot cleaning and oiling; spigot feeding with reinforcement cage into the pipe machine; discharge of the freshly manufactured products on a chain conveyor with subsequent removal via electric transport wagon.

Blizzard Tilting Table Machine for steel-reinforced manhole bottoms and tops

The tilting table method using a Blizzard Tilting Table Machine was chosen for the manufacture of manhole bottoms and tops. Only one mould is required for this. The pallet size is 1800 x 1800 mm, so that these manhole elements can be manufactured very economically in both nominal diameter 1000 mm and nominal diameter 1500 mm without base form.

The reinforcement cages are laid in the mould before the start of the cycle. The further sequence of the Blizzard Tilting



Manufacture of manhole bottoms and tops with just one mould using the tilting table method

Table Machine is fully automatic. First of all the concrete is poured in and pre-compacted by vibration. Further compaction takes place by means of additional pressing-in of the tamper by means of superimposed load vibration. The tilting procedure takes place subsequently against the pallet, which is tilted by 90°. The mould is thereby turned by 180° and moves at the same time out of the production area into the demoulding area. Safe demoulding takes place there by means of lowering the steel pallet and pushing out the manhole bottom. The mould pivots back to its initial position and the next work cycle begins. At the same time the last manufactured product is pushed further by means of the ratchet feeder and the next pallet is pushed into the demoulding area.

The Blizzard Tilting Table Machine distinguishes itself by its economical, automatic production process and the very high compaction of the product. The tilting table method additionally offers many production possibilities without the use of base forms. Hence the entire manhole system, with all elements such as manhole bottoms, manhole rings and manhole tops in various nominal diameters, can be manufactured on steel pallets very economically without base forms. To this end the design of the products was optimised, both for production and for the subsequent positioning at the building site.

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The manufacture of all elements of a manhole system takes place without base forms. The design of the products has been optimised.



In order to cope with increasing demands, the Barrikada company has purchased within a short space of time three plants in the latest versions for the manufacture of steel-reinforced pipes and manholes.