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High component quality thanks to SCC, individual leakproof design thanks to new production system

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In order to take concrete shaft production to a whole new level of quality, Precon Manufacturing Ltd. in the Canadian province of Alberta has installed a Perfect manhole base production system from Schlüsselbauer Technology. Thanks to the new system, the company can continue to guarantee that its components are leakproof, in line with previous customer requirements, and has industrialized its manhole channel production process.

Monolithic individual components produced in one pour. This promise of quality for concrete manhole bases, which Schlüsselbauer Technology has been providing for around two decades now, has also been of interest to the owners of Precon Manufacturing Ltd for some time now. After all, it touches two fields of basic requirements in day-to-day concrete plant practice. Firstly, it becomes more and more difficult to increase the output of a manhole base plant using traditional processes without growing staff and plant infra-

structure. And – even more critical – it is becoming increasingly difficult to find specialists with sufficient experience and consistently high motivation to achieve the best possible quality on a daily basis by retrofitting a concrete channel in a pre-moulded blank. When considering how to proceed with a forward-looking investment in its concrete parts production, it became increasingly clear that Precon Manufacturing needed a new production method to deal with both of these issues.

Material engineering is one of the two keys to solving the problem. Schlüsselbauer Technology, too, recognized that advancements in concrete technology over the past few decades were an opportunity to implement new production processes. Unlike vibrated earth-moist concrete, self-compacting concrete enables the use of lightweight moulded parts to make channel shapes and pipe connections to meet any requirements. This suitability, which is essential for de-



Cutting moulded parts to size—the cornerstone of the Perfect production process at Precon Manufacturing Ltd.



Setting up the channel, climbing aids, and reinforcement in the wall and floor.



Moulds for different construction heights are filled with SCC.



The mobile concrete silo can be operated using a hall crane or forklift.

velopment at Schlüsselbauer Technology, proved helpful for Precon Manufacturing Ltd. in two ways: Not only did the use of SCC make it possible to use the Perfect production system, but it also made it possible to easily meet the requirements for leakproof components.

Taking a more distanced view of the development of production processes for individual concrete manhole bases, the use of lightweight moulded parts represents a milestone—and in more ways than one. Until now, using different tools for moulding the channel and berm has led to varying component quality, as has installing the channel and berm freehand, even when done by experienced manhole masons. Lightweight moulded parts offer numerous advantages for the pipe connections in the manhole wall. The pipe connection can be made to fit precisely according to the position and inclination of the incoming pipe, thus improving the hydraulics in the sewer system. Furthermore, using moulded pipe connection components in the Perfect system eliminates the strenuous process of installing and removing the metal recesses frequently used in the past, which represents a real milestone in manhole production, both in terms of quality and ergonomics. This applies equally to the application at Precon Manufacturing Ltd. we are describing here and to the concrete manhole manufacturing industry as a whole.

In addition to the highest possible component quality, aspects relating to sustainability were also decisive for Schlüs-

selbauer Technology in determining the components of the Perfect production system. Ensuring that the component itself was durable and leakproof was the top priority. Taking into account the total service life of an infrastructure component – including installation, transportation and dismantling – the longer service life is the decisive sustainability factor when directly comparing components. In the field of wastewater infrastructure, ensuring permanent leak tightness is also one of the fundamental criteria of a sustainability assessment. When considering the materials required to produce a Perfect manhole base, the focus is on concrete on the one hand, and on the moulded parts for producing channel and pipe connections on the other. During the system development process, Schlüsselbauer Technology tested numerous processes and materials and, when weighing the achievable component quality against the use of resources, ultimately developed a system of EPS moulded parts that is easy to work with and that can just as easily be fed back into a recycling process. Material and energy consumption have also been significantly reduced through intelligent moulded part design, as a result of which the system has repeatedly been recognized as a suitable long-term production process from a holistic ecological point of view. Another material-related aspect is the use of self-compacting concrete. The dense packing of the concrete and the surface quality of the channel moulded parts result in a low water penetration depth in each individual component, which in turn contributes to longevity and value preservation in the sewer system.



In channel production, a custom moulded body is created with just a few cuts and hand movements.

The range of Precon Manufacturing Ltd.'s Perfect production line includes manholes of up to DN 1800 (72") and with overall heights of up to 2.60 m. Precon Manufacturing Ltd. attaches great importance to the project- and customer-specific design of its products; Perfect is ideally suited to meet this requirement. There is also a wide range of casting moulds available for day-to-day production. In order to eliminate the need to make modifications to the moulds as far as possible, 15 moulds with the most commonly used dimension 48" and flexible moulds with the dimensions 60" and 72" are used. Nevertheless, the height of the components can easily be adapted by setting up the bottom pallet accordingly.



In less than two decades, the brand has become synonymous with high-quality concrete manholes.

The Perfect production system is also well suited for different manhole diameters. This applies to the DN 1200, 1500 and 1800 (48", 60", 72") components required at Precon Manufacturing Ltd. and beyond for smaller diameters from DN 600 and larger components up to DN 2100. The amount of material used for the moulded parts for the channel increases at a slower rate than for the larger diameters in the Perfect production system—this is an aspect that is becoming increasingly important in more and more countries when it comes to resource efficiency and recycling. It was also a decisive factor for Precon Manufacturing Ltd. in determining what direction the company will take over the coming decades and how to invest in the company's future success. ■



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