

Schlüsselbauer Technology GmbH & Co KG, 4673 Gaspoltshofen, Austria

## Seals firmly embedded in concrete as a significant quality factor in monolithic manhole bases from Werra-Baustoffwerk

To manufacture completely watertight monolithic manhole bases and in doing so, reliably integrate a multitude of different pipe connections, was the requirement of those in charge at Werra-Baustoffwerk in Themar, Germany, on which they based the decision to invest in a new production line for manhole bases. Depending on the project requirements, around 20 different pipe connections must be created during manhole production – including the most diverse channel geometries, resulting from the position and incline of the pipe connections. In addition to the watertightness of the components right in the pipe connection, the custom-made channel configuration, which constitutes optimum hydraulics in the manhole and thus the basis for long-lasting channel systems, is imperative for the quality of manhole bases. The Perfect production system developed by Schlüsselbauer Technology for precise-fitting manhole bases complies with the highly distinct quality awareness for precast concrete components in the region of Thuringia and therefore with the expectations of Werra-Baustoffe without reservations. Waste water associations, civil engineering departments, construction companies and engineering offices being responsible for planning and construction site supervision are equally convinced by single cast concrete components with integrated gaskets.

■ Christian Weinberger,  
Schlüsselbauer Technology GmbH & Co KG, Austria ■

In addition to its high-quality wet-cast concrete features, a Perfect concrete manhole ensures the integration of seals, firmly embedded in concrete, and thus largely eliminates one of the most common causes of leaks in channel systems right from the outset – the improper connection of pipe-work to the manholes. The integrated gaskets are embedded into the concrete and are therefore supplied to the construction site, integrated stably and tightly into the

manhole base. Contamination, loss or inadvertent use of the wrong sealing components, damages to the components, resulting in leaks or delays in construction progress are therefore almost completely eliminated. The use of embedded seals was another key criterion of Werra-Baustoffe when selecting the production process for monolithic manhole bases.

Founded in the 1960s, the concrete plant today produces pre-cast concrete manhole components for various areas of application. In addition to components for the civil engineering industry – pipelines and man-

hole components – the product range includes staircase, wall and ceiling components, as well as additional constructional precast concrete components for a wide range of use. Whilst manufacturing prefabricated concrete floor was the main focus of production during the time of the East German housing programmes, the significance of civil engineering products increased after the fall of the wall in the early 1990s. It was at that time that the equipment manufacturer Schlüsselbauer realized its first plant implementation in Themar. So in 1992, Werra-Baustoffe



*After only one year, Werra-Baustoffwerk's customers have completed more than half of all manhole projects using Perfect monobases*



*The mounting of the formwork – in an ideal manner including preassembled seals – depicts the final preparation step of exact negative channels*



Concreting of Perfect manhole bases in steel moulds – manufacture of wet-cast components “in one pour”



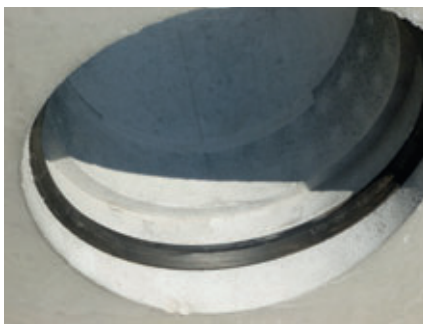
Werra-Baustoffwerk uses ready-mixed concrete to produce the manhole bases, which is poured using a crane track and a hopper

invested in the Exact type fully-automated manhole ring production, after which the production plant possessed the highest degree of automation at that time. Finally, in 2013 a smart Perfect production line with computer-guided hot wire cutting units, used for exact cutting of pre-formed EPS parts and numerous moulds in nominal widths of DN600 to DN1500 was installed to produce customized monolithic manhole bases. When it is required to reduce the unit weight and therefore to assist the customers and the construction companies in lowering their transport and installation costs, products with nominal widths of DN1200 and DN1500 can be produced with partially-reduced wall thickness.

Most notably, it is the visible quality of Perfect monobases by Werra-Baustoffe that is really appreciated by customers. The rea-

son for this is that only wet-cast concrete is used in the Perfect process. The concrete cures in the formwork and thus ensures the geometric precision of all joints alongside a high-quality surface with an extremely low water penetration depth. Moreover, when it comes to shaping the channel, it is exactly the nature of the preformed EPS parts that is such an important determinant of the concrete channel's final surface. The experienced employees of Werra-Baustoffe manufacture smooth channel surfaces by using the Perfect process. Accordingly no coating or any other post-treatment of the concrete channel and pipe connection area is required by hand. As a result they can save time and avoid considerable expense of resources used for surface finishing tasks. The process of manufacturing channel negatives and subsequently the actual chan-

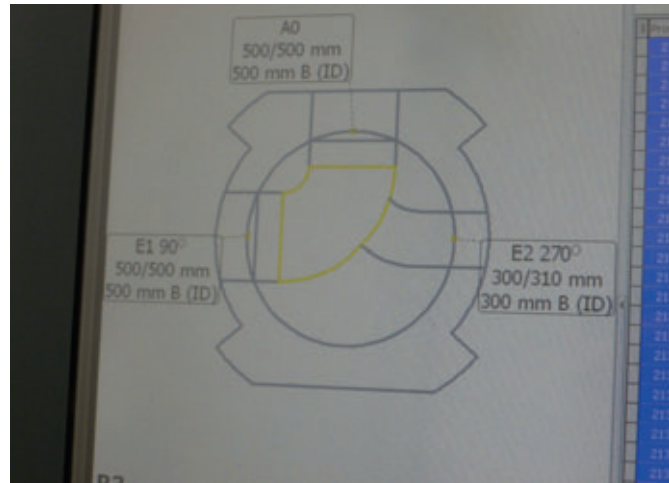
nel formed in the concrete manhole is quite simple. Production starts with planning and manufacturing a negative mould. After the plant has received the technical data from the customer, it supplies the software used for the construction of the custom manhole bases as well as all control commands for the hot wire cutters. Automated saws cut the components needed from the preformed EPS parts in stock which already have the required nominal width. Variable junction angles, pipe connection and channel inclines are all taken into account, as is the multitude of pipe connection types – ideally with embedded seals as expressly recommended by Werra-Baustoffe. After assembling the EPS components, the operator puts the complete channel negative into a steel mould. Once the release agent has been applied, the moulds are filled with



Different types of pipe are connected to Perfect manhole bases with or without integrated gaskets, depending on the project and type



The quality of Perfect monobases cannot only be seen from the outside of the product. The channel surface and the pipe connection area are also perfectly shaped to ensure watertight pipe connections for every type of pipe



One aspect of construction planning is the user-friendly visualisation, in which for example reductions in wall thickness can be easily considered in relation to weight and cost savings

concrete and the concrete remains in the mould until it has cured completely. At Werra-Baustoffe, the components are typically demoulded on the next working day. A hydraulic clampable sleeve is supplied by Schlüsselbauer to handle components with a nominal width of DN1500.

Alongside the Perfect manhole production, manhole bases with plastic shells are also produced, as well as components manufactured by traditional production methods involving the manual construction of channels and berms. The customized monolithic construction with embedded seals is, however, clearly on the rise – more than half of the manhole bases shipped in the first year have already been realized in Perfect qual-

ity. In addition to the trend towards monolithic components, the plant manager Dominik Schneider deems the construction of seals embedded in concrete above all to be the most significant advantage of his Perfect production system: "The seals pre-assembled in the preformed EPS part and embedded in concrete are a significant quality factor and simplify the pipe connection at the construction site, regardless of the planned material." With the use of these watertight pipe connections, Werra-Baustoffe is amongst the technology leaders in Europe in the production of monobases. More than 30 manufacturers in Europe and Northern America are making capital out of the Perfect production system today. ■

FURTHER INFORMATION

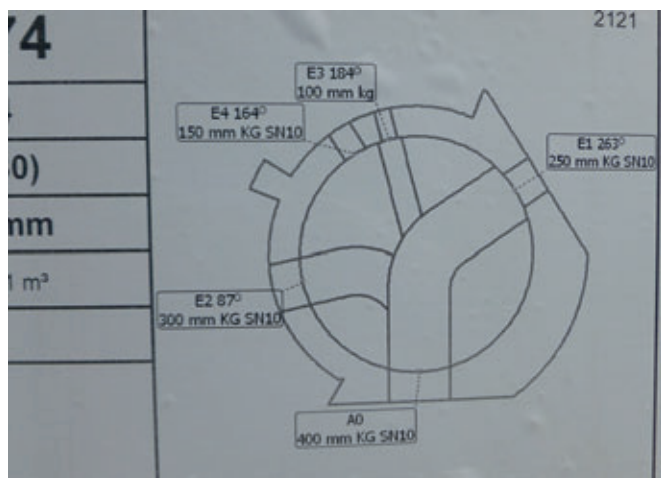
**SCHLÜSSELBAUER**



SCHLÜSSELBAUER TECHNOLOGY GmbH & Co KG  
Hörbach 4, 4673 Gaspoltshofen, Austria  
T +43 7735 71440, F +43 7735 714456  
sbm@sbm.at, www.sbm.at  
www.perfectsystem.eu



wbw Werra-Baustoffwerk Themar GmbH  
Schleifmühlenweg 10, 98660 Themar, Germany  
T +49 36873 260  
info@werra-baustoffwerk.de  
www.werra-baustoffwerk.de



Essential product features such as the type of pipe, position of the inlets or reductions in wall thickness are clearly documented by Werra-Baustoffe for Perfect manholes



A crane robot is a central component of highly-automated manhole ring and cone production installed at the beginning of the 1990s