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Fortier 2000 Ltée launches quality initiative on the Canadian civil engineering market with the production of wet-cast monolithic concrete manhole bases

A technology that is celebrating over 10 years of success in Europe, is now becoming increasingly popular in North America: monolithic concrete manhole bases made in only one pour with customised channel configurations are accepted state of the art when it comes to precision and component quality. Now, yet another well-known manufacturer, namely Fortier 2000 Ltée, a company based near by the eastern-Canadian metropolis of Québec, reacted to the changing requirements on the market at the start of this year by commencing production of wet-cast concrete manhole bases using the Perfect production system, which has been successfully implemented all over the world. The Perfect method, which was developed by the Austrian technology developer Schlüsselbauer Technology, for the production of custom-made wet cast monolithic concrete manhole bases, impresses with its optimised use of resources and the associated sustainable and economical nature of the production process as a whole. The mono bases, which are manufactured exclusively from flowing concrete and hardened in the mould in accordance with customised channel configurations, are also characterised by their precise geometry and very good hydraulics. Thanks to the use of the newly-purchased technology, Fortier 2000 Ltée is, with immediate effect, able to supply its customers with tailor-made, monolithically-produced manhole bases of very high quality.

■ Ralph Mitterbauer, Schlüsselbauer Technology GmbH & Co KG, Austria ■

Fortier 2000 Ltée – well-established manufacturer with long tradition on the Canadian precast concrete parts market

The Fortier 2000 Ltée concrete plant, which is based near Québec city on Canada's eastern coast, is able to look back on many years of manufacturing experience. Ever since it was founded in 1955, it has been producing a wide variety of concrete pipes, manhole components and other precast concrete components for the civil engineering sector. In 1997, the company was successfully taken over by the Le Groupe Riverin group of companies and, since then, the plant has traded as an independent subsidiary under the name Fortier 2000 Ltée. Last but not least, thanks to the unwavering commitment of its almost 100 employees and the expertise that they have amassed over the years, Fortier 2000 Ltée is today one of Canada's foremost manufacturers of both top-quality concrete pipes and manhole components for use in wastewater and drainage systems as well as several precast concrete products, e.g. pumping stations, for the supply of municipal drinking water.

Investment in Schlüsselbauer's Perfect Technology

Against a backdrop of increasing requirements in terms of the general quality of manhole structures in Canada, the company Fortier 2000 Ltée recognised the signs of the times and took the decision to pur-

chase modern production technology for the manufacturing of monolithic concrete manhole bases. The Perfect production system, which was developed by Schlüsselbauer Technology, is a solution that has been tried-and-tested over a number of years and which is constantly being adapted to take account of increasingly specific



The long-established Canadian company, Fortier 2000 Ltée, produces concrete pipes and manhole components for use in wastewater and drainage systems, as well as a multitude of precast concrete parts for use in civil engineering.



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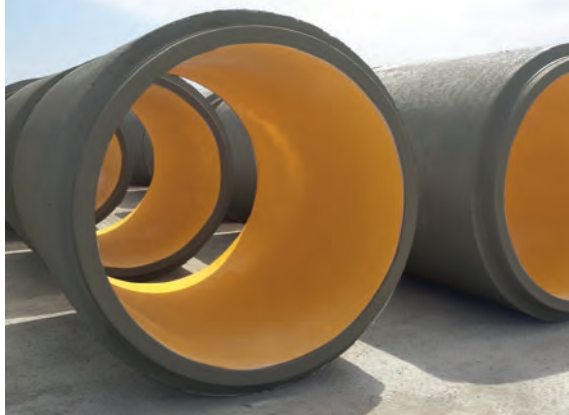
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Factory-integrated gaskets for the inlets and outlets of the manhole bases guarantee a tight bond with the surrounding concrete and ensure the watertightness of all pipe connections.



At Fortier 2000 Ltée, the manhole bases, which are manufactured from self-compacting flowing concrete, are usually demoulded the following day.

requirements. It enables the production of precise and watertight manhole bases using flowing concrete in only one pour, while also allowing for the creation of any channel configuration that may be appropriate. The Perfect technology has already been successfully implemented by more than 35 users worldwide. With its strategic investment in this innovative system, Fortier 2000 Ltée is taking a decisive step in the direction of a production method that is economical over the long term, and is at the same time adopting the role of a technological pioneer in the field of concrete manhole production.

A number of precise moulds with which monolithic concrete manhole bases measuring 36"/914 mm and 48"/1,219 mm in diame-



The finished monolithic manhole bases are lifted with the help of a product gripper and rotated 180°.

ter can be produced formed an integral part of the Perfect manufacturing system that was purchased from Schlüsselbauer Technology. The maximum construction height is 48"/1,219 mm and can be individually adjusted using the appropriate moulding equipment. This equipment enables Fortier 2000 Ltée to produce a large number of mono bases, each with different nominal widths and external construction heights, in a short space of time thanks to an economical and mostly automated process.

Customised and precise channel configurations due to Perfect moulding program

One of the key features of the Perfect production technology is the elaborate moulding program, which enables the forming of customised channels. Through the use of precisely-shaped negative channels, the Perfect method allows for the seamless adjustment of the angulation and incline of all inlets and outlets. This provides optimised hydraulics resulting in improved flow properties and less sediments, which in turn lead to longer maintenance cycles and limited corrosion. The process involves the precise assembly of prefabricated EPS elements such as arcs, straight lines and pipe connection components using simple hand tools to create a complete negative channel. After the plant has received the technical data from the customer, the Perfect software, which is used to produce the customised manhole bases, also provides all of the control commands for the hot wire cutters. The required components are cut out of the form parts that possess the necessary nominal width by a computer



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One of the characteristics of the Perfect system is the computer-controlled hot wire cutting technology, which ensures the precise cutting of the negative channel components and the pipe connection form parts.

and with the use of the smallest possible amount of the material, EPS (= polystyrene rigid foam). As a result, different junction angles, channel inclines and pipe connections are all taken into account, along with a wide variety of pipe connection types. This enables the simple production of any channel scenario that is required within the municipal wastewater sector and all in a single manhole base, with which allowances can also be made for any desired changes in direction, multiple inlets and varying construction heights. The result is optimized flow behaviour throughout the whole channel, whereby areas of congestion and unwanted turbulences are avoided.



Positioning lasers are used to help the worker to assemble the negative channel, while at the same time providing quality control.

Production of tailored pipe connection form parts in batch size one

In order to pre-empt customer-specific desires and future requirements with regard to the necessary pipe-manhole connection combinations, Fortier 2000 Ltée has decided to purchase an additional profile saw developed by Schlüsselbauer Technology, which was first presented at the Precast Show in Nashville in March 2016, in front of a wide audience. The saw in question is a computer-controlled hot wire cutter, which makes it possible to quickly and easily produce customised and precise pipe connection form parts and



Pipe connection form parts, cut to size from polystyrene rigid foam using a profile saw, with fitted gaskets.



Company premises of Fortier 2000 Ltée near Québec on Canada's eastern coast.

recess bodies from polystyrene rigid foam, while keeping the amount of material used to a minimum. The form parts produced in this way are then used by Fortier 2000 Ltée as placeholders during the manufacturing of monolithic manhole bases from flowing concrete. By using the profile saw, all conventional pipe types, nominal widths and gasket types are able to be taken into account.

Monolithic manhole bases with factory-integrated gaskets

Fortier 2000 Ltée recommends that its customers have the gaskets for inlets and outlets pre-integrated into the monolithic concrete manhole at the plant. These ensure that one of the most frequent causes of leakage within the channel system, i.e. the incorrect and therefore non-watertight connection of pipes to the manhole, is able to be largely excluded from the outset. As soon as the individual channel components, which have been cut to size from EPS, and the side pipe connection components with prefitted gaskets have been prepared in accordance with the requirements, they are hot-glued one another by hand in order to create a complete negative channel. Positioning lasers are used to aid the employees in this process. Following this step, the EPS negative channel is placed into the designated steel mould. Finally, this is filled with flowing concrete in a single production step. This results in a complete manhole base with prefitted gaskets that is made in only one pour. As is generally the case with the Perfect method, Fortier 2000 Ltée is also using self-compacting flowing concrete exclusively, which not only ensures the geometric precision of all joins, it also enables a consistent density to be maintained in monolithic construction and produces a high-quality surface with exceptionally low levels of water penetration. The high levels of durability, which have been scientifically confirmed on a number of occasions, both in terms of resistance to chemical attack and outstanding levels of resistance to pressure and abrasion, of monolithically-produced concrete manhole bases that have been hardened in the mould, provide convincing arguments in favour of the Perfect method. This was also recently confirmed in a test report in April 2016, drawn up by KIWA Bautest GmbH in Augsburg, in which the monolithic manhole bases manufactured using the Perfect

production system were consistently awarded top marks in the categories assessed, namely watertightness, water penetration and resistance to pressure (source: KIWA Bautest GmbH 2015-2016). As a member of an international group, which is active in over 40 countries worldwide, KIWA Bautest GmbH provides independent and universally-accepted testing and certification of products, systems and environmental protection services at 13 sites across Germany, and places particular emphasis on the quality testing of construction materials and products.

The longevity of the components is ensured through the hydraulically-perfect formed channels and the advantageous properties of the flowing concrete used, which enables a consistent density to be maintained during the monolithic construction of the precast component. As a result, one can confidently say that the expected life-cycle of the manhole bases produced using the Perfect method is more than 100 years, thanks to the wide range of advantages provided by the product.

The monolithic concrete manhole bases hardened within the mould at Fortier 2000 Ltée are generally ready to be demoulded the following day. In order to do this, the two-part outer moulds must first be unlocked and separated from one another. Next, the mono bases are lifted out of the mould by a product gripper that is fastened to a turnover spreader beam, rotated 180° and set down. Following this, the EPS negative channel and the pipe connection form parts are removed from the manhole base by hand, with the help of simple tools. Finally, the finished products are transported to the storage area using a forklift truck.

Competitive advantage thanks to flexibility and manufacturing expertise

The monolithic concrete mono bases with factory-integrated gaskets produced in only one pour herald a new age of manhole production at Fortier 2000 Ltée. Thanks to the Perfect production technology, the company is in a position to be able to manufacture manhole bases with a variety of nominal widths and construction heights as well as customised channel and pipe connection configurations within a short space of time. This puts Fortier 2000 Ltée at a distinct competitive advantage in the Canadian civil engineering market.

It is little wonder then that CEO Guy Turcotte, who represents the entire Fortier 2000 Ltée management team, is full of praise for the excellent premiere of the Perfect system: "As a result of purchasing the Perfect technology from Schlüsselbauer, we have been able to bring our manhole production in line with the state of the art. Thanks to the positive experiences that we have enjoyed with the new method, we are very much looking forward to now being able to supply our customers with top-quality, watertight and durable monolithic concrete manhole bases, which can be provided with custom configurations. In addition, the incredibly economical production method used by the Perfect system proves that we made the correct investment decision at the best possible time." ■

FURTHER INFORMATION



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