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Con Cast Pipe in Canada Responds to Increasing Quality Awareness with Concrete Pipe Featuring HDPE Liners

■ Mark Küppers, CPI worldwide, Germany

Thanks to its extremely high quality standards, reliability, and fast order handling, Con Cast Pipe in Canada is undergoing rapid expansion. The company, based in the Toronto metropolitan area, is an incredibly successful one-stop supplier of wastewater systems throughout the entire province of Ontario. Con Cast Pipe strives to continually improve levels of efficiency and effectiveness within the firm, as is demonstrated by its ISO 9001:2008 certification.

Six years ago, Con Cast Pipe took another step toward modernization when it became the first North American manufacturer to invest in Schlüsselbauer Technology's Perfect industrial production system for individual monolithic concrete manhole bases. The company was able to market these products, which were new to this particular region, very successfully and, in turn, to give the contracting authorities a new focus on quality with regard to durable concrete wastewater systems. Con Cast Pipe then went one step further by also offering its customers Perfect Pipe concrete-HDPE composite pipe, again produced in line with a Schlüsselbauer Technology manufacturing process. Perfect Pipe combines the benefits of robust concrete pipe and resistant synthetic liners in a single product. In taking this step, Con Cast Pipe was responding to the growing demand for a complete system in which both the manhole bases and the pipe are made from concrete and meet extremely high quality requirements, with none of the elements constituting a weak point. Contracting authorities want perfectly watertight complete systems that in practice prevent the uncontrolled escape of wastewater and, likewise, the ingress of groundwater. With its Perfect manhole and pipe elements, this is exactly what Schlüsselbauer promises to provide its customers.

Con Cast Pipe was founded in 1989 and has three production facilities located in Guelph, Oakville and St. Catharines, Ontario. The company's success story began in Guelph, where the first precast concrete products were made. The Oakville site was added in 2002 and is where the new Perfect Pipe manufacturing plant can be found today.

All the locations offer plenty of space and are being modernized all the time. When the Oakville facility was started up, two fully automatic Schlüsselbauer systems for producing pipe and standardized manhole bases were installed, including a



Con Cast Pipe in Oakville

fully automatic Schlüsselbauer Exact 2500 pipe system (up to 820 mm outer diameter in double production, otherwise single production), which is now in its 15th year of manufacturing concrete pipes of a consistently high quality.

It was also at this site that Perfect concrete manhole base production facility from Schlüsselbauer was started up in 2011. The Perfect products, manufactured in a wet-cast process, boast consistent concrete quality throughout the whole product, including the berm and pipe connection. From the very beginning, Con Cast Pipe has impressed its customers with the exceptional finished quality of its products, which is clear just from looking at them.

An Eye on New Products

Over the years, an incredibly close business relationship has developed between Con Cast Pipe and Schlüsselbauer, with the former following the evolution of Perfect Pipe with great interest right from market launch. To Con Cast Pipe, even the very first prototypes exhibited at Bauma 2010 represented pioneering work. They saw them as the perfect subsequent addition to the range of top-quality manholes already on offer. The first Perfect Pipe production facility was started up in 2012 at Bernhard Müller GmbH in Achern, Germany, and was visited by Con Cast very early on. The company's management team was able to see the potential benefits of this new concrete pipe for itself.



Samples park with various Perfect Pipe concrete-HDPE composite pipes



Con Cast Pipe has built special frames where the pipes are placed for storage and subsequent transportation to the construction site

When the decision was then taken to offer Perfect Pipe concrete-HDPE composite pipes in future too, production of Perfect concrete manhole bases was relocated to Guelph and, with the installation of the new Perfect Pipe line, the Oakville facility was upgraded to a pipe center of excellence.

Perfect Pipe and Manhole Elements from a Single Source

If a customer needs manhole elements and pipes for a wastewater project, it is clearly a huge advantage if one provider is able to supply them with both products from a single source. Of course, it's even better still if all of the elements are of the same high level of quality. With this in mind, Perfect Pipe and Perfect manhole bases are a practical pair of complementary products for quality-conscious customers.

Wastewater Systems Made of Concrete-HDPE Composite Pipes

With Perfect Pipe, Schlüsselbauer Technology heralded a new era in wastewater sewage systems. The manufacturing process creates a durable connection between liners made of high-quality synthetic material (polyethylene) and pipe made of high-strength concrete, thus fulfilling the essential demands placed on wastewater drainage pipe. These include resistance to intensified chemical attack, a high static load capacity even in the case of traffic loads, easy handling on the construction site, and better safety throughout the installation and operational processes.

The same method can be used to produce wet cast Perfect Pipe concrete pipe without the liner too, thus facilitating mass



The liner is made of high-quality polyethylene (HDPE), a material which is resistant to chemical attacks



Perfect Pipe in the Con Cast Pipe outdoor storage area



The Schlüsselbauer Exact 2500 has been in operation since 2002



One of the two mbk cage welding machines used at Oakville

production of wet cast concrete pipe. Pipe can be produced with or without integrated gaskets and as either concrete pipes or steel concrete pipes, all depending on the project requirements.

Upright Perfect Pipe Production

Although the Perfect Pipe facility that the company visited in Germany makes prebed pipe, Con Cast Pipe decided to manufacture circular bell-shaped joint pipes using upright production, which means that the closed and prepared pipe mold is filled with concrete from above. After hardening has occurred in the mold, it is opened and the pipe can then be pulled off the core. The pipe molds consist of two halves, which move on tracks. Like the core, the tracks are permanently mounted on a carrier unit.

At the moment, two dozen molds are in operation at Con Cast Pipe, which are able to produce pipes from DN600 to DN1200.

HDPE Liner Production

Before a pipe featuring a firmly anchored HDPE liner can be produced, the corresponding liner cylinder must be made. This is the first manufacturing step and it takes place in a production area that is separate but directly joined to the mold station.

The liner is made of high-quality polyethylene (HDPE), a material which is resistant to chemical attacks, abrasion-resistant, and weldable. In a later step, the liner is tightly connected to the concrete pipe via numerous small anchors on its back. The liner features even more anchors around where the pipe connections are located in order to provide a reliable, permanent connection to the concrete pipe.

According to the manufacturer’s specifications, the pull-out resistance of each anchor is more than 250 N (56 lb); the entire liner can safely withstand permanent groundwater pressure of 1.5 bar (22 psi). Even major temperature fluctuations

will not cause the liner to separate from the surrounding concrete.

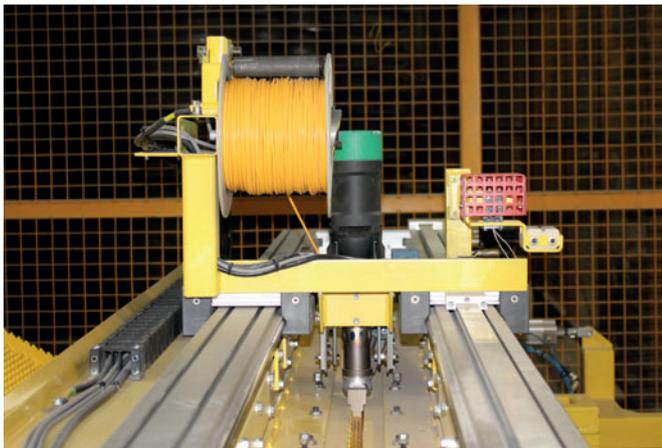
The material is kept in stock on continuous rolls. An employee cuts the required length (lateral surface of the mold core) from the roll at a cutting table and feeds this piece into the welding machine. This welding robot, also developed by Schlüsselbauer, then welds a seam using PE welding wire, securely connecting both ends of the liner to one another.

The fully welded liner is ejected from the welding machine and removed by an employee. The liner is then clamped into an auxiliary structure that makes it easy to handle with a crane.

Next, a crane places the liner into the reshaping station. Here, one end of the cylinder-shaped liner is first formed in a thermoplastic process according to the contour of the subsequent pipe joint, with the liner mounted on a steel pallet. In the next step, the liner is turned and reinserted into the reshaping station. The second end is then formed and the steel pallet pushed into it.



Perfect Pipe production mold station at Con Cast Pipe



A welding robot welds a seam using PE welding wire, securely connecting both ends of the liner to one another



The fully welded liner is ejected from the welding machine and removed by an employee

A crane then transports the prepared liner to the mold, which is equipped with separating agents, and sets it down over the shrinkable mold core. After that, a reinforcement cage with spacers is inserted too. Finally, the mold is closed. At Con Cast Pipe, the concrete is poured manually with a concrete hopper.

Centralized Production of Reinforcement Cages for All Lines

The individual reinforcement cages are manufactured on site using two cage welding machines from mbk, which provides large quantities of reinforcement cages for the fully automatic Schlüsselbauer Exact 2500 pipe system that went into operation in 2002, for instance.

Demolding and Quality Check

Once the mold is filled, the concrete hardens for a day, before the new concrete-HDPE composite pipe can be demolded and lifted out of the mold. To this end, the two halves of the mold shell are pulled apart and a robot equipped with a universal gripper for all pipe diameters grasps the pipe and lifts it carefully from the mold core.

The pipe is then turned by 90° and placed on a conveyor belt. After an automatic leak test, the pipe is transported outside and set down at the intended location in the outdoor storage area. Con Cast Pipe has built special frames where the pipes can be placed for storage and subsequent transportation to the construction site.

The finished Perfect Pipe concrete-HDPE composite pipe do not hang around in the outside store for long, however, as current demand for this type of pipe means that production is running at pretty much full capacity.

A New Product Brings Growth

High demand right from the start indicates that Con Cast Pipe chose the right path once again. There was huge interest in the new wastewater pipe from day one, with Con Cast Pipe's good reputation playing no small part in that.

"Zero leaks." That's the short and snappy way in which the President of Con Cast Pipe, Mr. Brian R. Wood, sums up the demands of the public authorities when it comes to completely watertight wastewater systems. This is a requirement that the concrete sewage systems of the past could not necessarily always fulfill in the long term given that normal concrete pipes were not sufficiently protected against chemical attacks.

However, new approaches like the Perfect wastewater elements are now able to offer solutions here that can break new ground and make precast concrete products more competitive than ever before for this field of application.

"The concrete industry has transformed more in the last 10 years, particularly where the wastewater sector is concerned, than in the previous 50 years combined. Today, new production techniques mean that we can make precast concrete products of such high quality and resistance that not only are they now comparable with other materials, but in many respects they even come out on top," says Brian R. Wood, who is very happy with these developments.



Forming pipe joints in the reshaping station



A crane transports the formed liner (with pallets) to the formwork mold and sets it down over the shrinkable mold core



Fully prepared with liner and reinforcement cage



Hardened Perfect Pipe composite pipe

"However, Perfect Pipe should not be seen as being in competition with conventional concrete pipes; many people misunderstand that to begin with. It covers completely different fields and, as such, opens up new markets to us that we were previously unable to serve. The situation has changed. More emphasis is being placed on durability in infrastructure projects and it is no longer a question of looking solely at price. This is exactly where Perfect Pipe offers many benefits over conventional wastewater pipe made of steel or PVC, for example, especially when it comes to providing a durable, low-maintenance, and permanently leak-free wastewater system," says Brian R. Wood.

The Concrete Plant Leaves Its Dusty Image Behind

"Perfect Pipe is an innovative product that is inspiring customers and young engineers alike. It is moving away from the dusty and dirty image generally associated with concrete plants, toward that of a facility that manufactures modern, high-tech materials. This is in turn transforming concrete plants into more attractive employers once again. The increasing degree of automation found in these facilities is playing its part in this too," says Brian R. Wood, adding: "The dirty work of the past no longer exists - at least not as far as we are concerned."

A Bright Future Ahead For Perfect Wastewater Systems

"The move into Perfect Pipe technology came at exactly the right moment. We were able to establish the Perfect manhole elements on the market and now offer the right product at the right time. There are currently around six million people living in the Greater Toronto Area, with that figure rising sharply. So there is a great deal to be done in terms of infrastructure and

there is no reason to think that this situation will change. The demand for wastewater systems is really high and we are making them more or less on Toronto's doorstep. We see a very bright future ahead for Perfect Pipe and, of course, for our Perfect manhole bases too," says the President of Con Cast Pipe, who is looking to the future with confidence. ■

FURTHER INFORMATION



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