

# DIGEST

## CONCRETE PRESSURE PIPE

### PCCP Is the Future

When the City of LaPorte, Indiana called for the replacement of a section of existing 1930's 36-inch vintage concrete sewer line, it turned to Prestressed Concrete Cylinder Pipe. The existing line was damaged from years of impact by farm equipment, tree roots penetrating the wall and exposure to the atmosphere.

As a result, the damaged pipeline was allowing rainwater runoff to flow into the system, exceeding treatment plant capacity and causing sewer overflows into an environmentally sensitive area. Those problems would be solved with the installation of a new pipeline.

The proposed 42-inch replacement line was to be installed thru a wetland, which limited standard installation techniques. The original ground surface was not to be altered and wooden mats were to be used to support heavy equipment to avoid disturbing existing vegetation.



*Crossing Patton Cemetery, PCCP was precisely placed on piles. Being acid resistant and immune to atmosphere exposure, PCCP was a natural choice for the project.*

Nies Engineering of Hammond, Indiana was selected to design the project. The material to be specified had to be resistant to low pH soils and also be suitable for installation on piles. Therefore, steel pipe options were eliminated. In many cases for this type of application, Reinforced Concrete Pipe would be specified. But due to the pipeline location, there was no tolerance for infiltration/exfiltration. Prestressed Concrete Cylinder Pipe with its bottle-tight steel joints, rubber O-ring gaskets and impermeable steel cylinder was the logical choice.

The crossing thru Patton Cemetery called for exact placement of the piles in an environmentally sensitive area, with a pipe to withstand exposure to the atmosphere, acidic soils,

expansion/contraction of the pipeline and the structural integrity to resist moment forces created by the free span.

The initial 9 to 11 feet of soil was peat bog underlain with sandy gravel, which served as a good bearing surface for piles. The 42-inch line was placed on Z piles (typically found in seawall construction) with a metal plate welded to the pile and a 1-inch neoprene pad placed between the pipe cap and the exterior of the pipe. In order to assure correct placement of the piles in reference to the pipe joints, a layout drawing was furnished to the contractor.

Because the line is a gravity sewer, and because additional disturbance to the wetland was not allowed, the 42-inch pipeline had to be installed at

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the same elevation as the existing pipe, which resulted in a higher profile. Consequently, there was more area exposed to the atmosphere. In order to protect the surface from the harmful rays of the sun, the exterior of the pipe was painted with 20-mils of Coronado Elastomeric Coating 162.1. The paint is waterproof, durable, and most importantly non-toxic to its environment.

This higher profile also prevented water from migrating from one side of the pipeline to the other. In order to allow movement of the water, an inverted siphon was installed across the pipeline.

The project was ultimately successful because of the good communications among the consultant, supplier and contractor. Dye Mechanical, Inc. of Laporte, Indiana performed the installation.

The job was completed, the combined sewer overflow was eliminated, and the wetlands were restored to their original condition. The 42-inch cylinder pipe was furnished by Cretex Pressure Pipe, now owned by Price Brothers Company, Dayton, Ohio. 💧

Contributed by Vince Papparozi  
Cretex Pressure Pipe, Inc.

## Concrete Nixes PVC

**T**he Public Utilities Commission of the Town of Bradford West Gwillimbury is located about 60 miles north of Toronto, Ontario, Canada. Since 1986, the town has recognized a need to develop an additional source of potable water to meet its growth. A series of studies, hydrogeological

surveys and a class environmental assessment resulted in a total capacity rating of 12830. m<sup>3</sup>/d (3.4 MGD) for 7 connected municipal wells in Bradford.

The environmental assessment report of October 1994 recommended the Town of Bradford:

- Continue with water conservation methods.
- Test pump and monitor adjacent wells as well as develop new municipal well sites, and
- Assess the feasibility of developing a future surface water source.

The first recommendation was quickly implemented. If the potential of the wells were developed and connected, it was expected that the total municipal water supply capacity would be in the order of 15252 m<sup>3</sup>/d (4 MGD).

However, the existing wells could service a population of 18,000 persons and if all the wells were developed the maximum population that could be serviced is 21,015 persons. In 1998 the population of Bradford was 15,000 persons. The design population based on the capacity of the sewage treatment facilities was 30,000 persons. Based on average water consumption the ultimate water supply demand to service 30,000 persons was 20628 m<sup>3</sup>/d (5.4 MGD).

Early in 1999, Bradford selected a surface water proposal to purchase water from the Town of Collingwood through the existing 600 mm diameter 60 km (37 mile) Collingwood-Alliston transmission main and deliver it the remaining 10 km (6 mile) to Bradford.

The first phase of the new trunk watermain was tendered in 1999. The project consisted of 7 km (23,000 ft.)

of 350 mm diameter (14-inch) pipe. PVC pipe was specified for the entire project. The low bid contractor was Sanan Construction, Concord, Ontario. When the contractor was awarded the project it contacted Lafarge Pressure Pipe about supplying 400 mm (16-inch) diameter AWWA C301 PCCP pipe in lieu of 350 mm (14-inch) diameter PVC pipe.

Sanan Construction requested the use of PCCP because it was more cost effective to use PCCP customer fittings, longer pipe lengths and pre-installed service connections. The pipe manufactured in 7.3 mm (24 ft.) standard lengths and the joints were metalized steel bell and spigot with an O-ring rubber gaskets. To facilitate installation, the many horizontal and vertical bends were mechanically restrained with “Snap Ring” restrained joints. The use of mechanically restrained joints provided flexibility to the pipeline and concrete thrust blocks were not required. To allow the contractor to install the pipe more quickly, Lafarge installed 19 mm diameter (3/4”) IPT service connections on the pipe during the pipe manufacturing process.

The design engineer was Triton Engineering Services Limited, Orangeville, Ontario. The engineer and the Town of Bradford allowed PCCP to be used for this transmission main because of its inherent strength, long life, serviceability and adaptability in the field conditions. 💧

Contributed by Martin Doran  
Lafarge Pressure Pipe



# Concrete Means No Leaks

**T**erre Haute, a city located on southwest part of the State of Indiana, better known as the home of Indiana State University, is presently overhauling its sewer system in order to serve future demands. The Sanitary District Project 18 Airport/SR 46 Interceptor Phase I Sanitary Sewer Extension is currently under construction. The scope of this project is to provide large diameter interceptor sewer service east to the airport to attract businesses to the area. At the same time three smaller lift stations will be eliminated. Additionally, plans are to provide future service to the north under the Phase II contract. Project 18 consists of approximately 6,000 feet of 60-inch and 8,500 feet of 48-inch sanitary sewer, 38 manhole structures, 2, 60-inch road crossings, and 4, 48-inch railroad crossings. Hannum, Wagle & Cline, Inc of Terre Haute is the consultant selected for the project.

Terre Haute Sanitary District allowed 3 bid materials for Project 18; PCCP, Hobas and Ductile Iron. Six contractors submitted bids for the project, with the two lowest bidders naming PCCP. Installation with PCCP was less costly than with Hobas and Ductile Iron due to the more stringent installation requirements for flexible and semi-rigid pipes. Flexible pipe required crushed stone to 1 foot over the top of the pipe while PCCP required bedding only to the springline. Additionally, due to the high water table, anti-flotation anchors were required for Ductile Iron and Hobas, further increasing their installation cost.



*Installation of 60-inch diameter PCCP through trench box.*

Overall cost savings were also contributed to the design versatility of PCCP. Unlike the competitive materials, 30-inch manholes were built into the 20 foot nominal sections of PCCP, eliminating the need for tees or precast manholes, which were significantly more costly and required more joints. Remember, all Concrete Pressure Pipe products are designed for the project, not the other way around.

The original planned route for the pipeline was adjacent to the Thompson Ditch. After careful review and input from a number of contractors, it was determined that installation along this route would mean excavating a 40-foot deep trench. That scenario would not be as feasible because of limited space to store the backfill and the cost to excavate at that depth.

At the recommendations of the contractors, the route was moved to the bottom of the Thompson Ditch. The main problem encountered would be water in the trench during rainy seasons. However, the installation would be less costly and production greatly increased due to the more shallow cover.

Prior to starting installation, Bowen requested delivery of all the 60-inch PCCP so that it could be strung out along the ditch. That meant delivery of up to twenty loads per day. Once the delivery was complete the crew went to work installing an average of 240 feet per day. A Koehring 1066 backhoe was used to excavate and set the pipe while a CAT 330 backhoe was used to backfill and compact the trench.

The material at the top surface of the Ditch was silty clay. After the top layer was removed, sand and gravel existed below that point which served as excellent backfill for the pipe. No imported soil was required for the project. All the material placed back in the trench was compacted to 95% modified proctor.

The six crossings thru berms originally required installation of casing pipe. Once the route was moved to the Ditch, Bowen relocated the crossings to under the railway bridges. Thus allowing all but one of the 60-inch crossings to be installed in open cut. This value engineering option proposed by Bowen, saved the Terre Haute Sanitary District approximately \$800,000 (15% of the total project cost).



# Price Brothers Company Acquires Cretex Pressure Pipe, Inc.

**P**rice Brothers Company of Dayton, Ohio has acquired the the assets of Cretex Pressure Pipe, Inc. of South Beloit, Illinois. The South Beloit facility employs 80 people and makes Prestressed Concrete Cylinder Pipe used in municipal and industrial pressure water and wastewater systems.

Price Brothers, an employee owned company, is the largest supplier of concrete pressure pipe in the U.S. The company also exports large diameter concrete pipe and sells equipment and technology for pipe plants in developing countries. With the addition of the South Beloit plant, the company has 5 plants and 4 sales offices located in the Central and Eastern regions of the U.S., and one subsidiary located in London, U.K.

Established in 1899, the company currently has 600 employees including 40 employees at the corporate office in Dayton, Ohio.

“This is the first acquisition by Price Brothers in 14 years and comes 2 years after the employees assumed full ownership of the company,” said James S. Clift, President and CEO. “The addition of the South Beloit facility adds 30% to our production capacity at a time when our existing plants are running at full capacity.” The purchase transaction was completed on October 30, 2000. No terms of the transaction will be disclosed.

For additional information, contact James S. Clift, President and CEO of Price Brothers Company at (937) 226-88882.



*Forty-eight-inch diameter PCCP strung out along the right-of-way, awaiting installation.*

Typically, PCCP is furnished in 20 ft. nominal lengths, but at the railroad bridges, the contractor ordered 10 ft. sections, which facilitated installation of the tight access location. The pipe could then be placed on rails and the joints pulled home.

Pipe furnished for the casing installations was fabricated with raised mortar coating collars. The

collars act as spacers, and are an integral part of the pipe, acting as a sacrificial surface as the pipe is pushed thru the casing. That option eliminated the use of separate and costly spacers, another advantage of installing PCCP.

Due to the potential for hydrogen sulfide formation, the interior of the pipe was coated with 10 mills of

Ameron Epoxy. In lieu of grouting the interior joints, the sections exposed to the flow were also coated with the same material. By painting the joints and eliminating the grout, the contractor was able to apply an air test immediately after the joint was pushed home.

The only slowdowns on this project were caused by heavy precipitation; otherwise production proceeded as usual. If installation continues at this rate, Bowen should finish ahead of schedule.

All PCCP furnished was supplied by Cretex Pressure Pipe of South Beloit, Illinois, now owned by Price Brothers Company, Dayton, Ohio. 📍

Contributed by Vince Papparozi  
Cretex Pressure Pipe, Inc.