CENTRI-PIPE®

The *Original* Centrifugally Cast Concrete Pipe (CCCP)

When your infrastructure repairs require quality materials and installation ……..
Put our proven experience to work for you.

Trenchless
Structural
Cost effective

CENTRI-PIPE®

Another trenchless solution by
AP/M PERMAFORM




CentriPipe® – The original, patented, and proven system for trenchless, structural, and cost effective pipe rehabilitation.

- Man entry sized pipes up to 144" diameter
- Vertical structures such as manholes, wet wells, and lift stations of nearly any shape or dimension
- Flexible design for the restoration of assets in very poor condition
- Specialty mortars and admixtures designed for this specific range of applications

Municipal and DOT, Sanitary and Storm Water Case Histories

Westlake, OH – Sanitary Interceptor Rehabilitation

- 70,000 people depend on the Westlake system
- The City of Westlake saved at least $1.5 million
- An inspection of the interceptor found microbiologically in duced corrosion (MIC) had eaten away 1/2-inch to 1 1/2-inches of the concrete pipe's inner surface. "And," says Westlake Field Engineer James J. Smolik, PE, "since the pipe thickness is only six-inches, we knew we had a problem."
- Westlake selected CentriPipe® technology – a truly trenchless rehabilitation technology, to restore the corrosion damaged interceptor.
  - The equipment can be introduced to pipe interiors via manholes, avoiding excavation and street-level disruption. The spincaster can be started and stopped at any point in the pipe, and adjusted as needed for changes in diameter.
  - Westlake employed the use of Con[mic]Shield® concrete additive designed to prevent further MIC damage. Using treated cementitious grout allowed Westlake to overcome the additional challenges they were facing.

"This cost less than half of what the manhole-to-manhole cost would have been," says Westlake Director of Engineering Robert P. Kelly, PE, "and I believe the finished product is at least as good, maybe better. Because of this savings, we were able to use our own funds, and do the work within a year. Those are huge wins!"

New Jersey DOT – Emergency Highway Repairs

- The intersection of routes 9 and 440 with the Garden State Parkway, one of New Jersey's busiest and most vital cloverleaf complexes, developed sinkholes following 2011's Hurricane Irene
- **More than 500 feet of 60-year-old pipe was failing,** with joints that were falling apart and some inverts that were completely rotted out.
- Collapsing sewer under the cloverleaf needed to be repaired or replaced quickly and without road closures – and the pipe diam eters were quite large—**300 feet of 72-inch bituminous-lined CMP, and about 240 feet of 60-inch bituminous-lined CMP**
- Repairs had to be completed immediately, during the heavy storms that followed Irene, with work completed in wet conditions
- Alkesh Desai, the storm water emergency manager for the New Jersey Department of Transportation (NJDOT) selected CentriPipe® to quickly and cost-effectively repair the damaged pipe without traffic disruption
- Using the CentriPipe® system, sewer joints and inverts were repaired, collapsing pipe sections were stabilized, and several passes through each sewer were made, applying thin layers of PL-8,000 with each pass until a total thickness of two-inches was reached

"The project was completed on time and the initial results look good. So at this point we're happy with the results and if it proves to be durable it will also be cost-effective," Desai says, "So we will certainly be using this technology again and especially in emergency situations like this one.






More than 35 years of experience manufacturing cementitious liners for underground structures

- Permanent solution
- Environmentally friendly
- Fiber-reinforced
- Bi-directional centrifugally cast
- Quality products and quality workmanship
- Fully structural pipe within the old pipe
- Full flow capacities maintained
- Completely monolithic – no joints
- Sealed against ground water erosion
- High abrasion resistance
- Quick return to service
- No excavation required
- Impermeable – cannot leak
- Certified applicator network

Engineering and Design

From the standpoint of mechanics, a lining's design is affected by the imposed deformations of the host structure and by hydrostatic pressure when the sewer is below the water table.

The level of loading, and how the loading will be transferred to the new liner – based on the in place performance of the surrounding soils and the existing pipe's current condition – must also be taken into account.

CentriPipe® is a precisely placed and compacted concrete liner applied at the best design thickness for the diameter and conditions, providing a cost-effective and fully structural lining for sanitary and storm pipe 30 inches in diameter and larger whether round, arched or elliptical.

Figures 1 and 2, top and center right, illustrate the need for developing a suitable liner thickness in corrugated metal pipe structures. In non-profile wall surface pipes, the stated liner thickness is obvious; but, in the design case where the wall surface is profiled, the design engineer must realize the impact that the mortar has on the location of the neutral axis. In corrugated metal pipe structures the required wall thickness is measured from the crest of the corrugations or the top of the nuts and bolts (for metal plate).

Figure 3, bottom right, illustrates the live load is typically distributed through the soil to the top of the pipe. As the depth of cover increases over the pipe one can see that the load influence quickly begins to exceed the span of the buried pipe. The soil arching action that is the product of this physical geometry is a very real and beneficial phenomena that is key to the proper rehabilitation of the soil-structure interaction system. It is incumbent upon the design engineer to take advantage of this very valuable asset and capitalize upon it for the pipe owner.

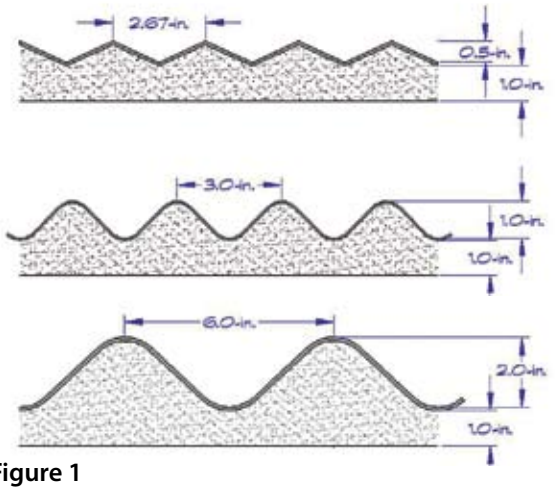

Figure 1

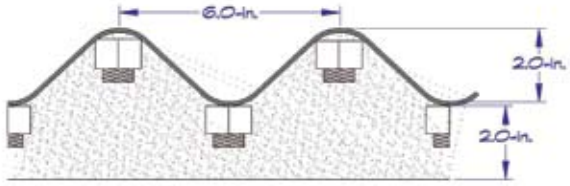

Figure 2

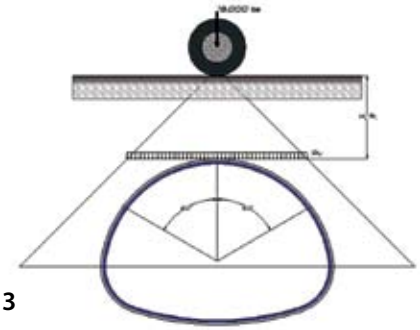

Figure 3

Your One-Source Solution for Sanitary and Storm Water Rehabilitation Projects

	CMP Rehab Missouri DOT	RCP Rehab West Palm Beach, FL With Cor+Roc®epoxy-based polymer liner	Brick Rehab Warsaw, IN
PROJECT SITE			
CORRODED PIPE			
REPARING AND RELINING PROCESS			
			
RELINED PIPE			

AP/M Permaform offers engineered solutions for repairing badly deteriorated manholes, pipe and similar structures without excavating with our **CentriPipe**® and **Permacast**® systems. Additionally, our **Con**[MIC]**Shield**® "bio-tech armor" prevents microbial induced corrosion in sanitary sewers, while our **Crystal-X**™ products provide waterproofing protection for concrete.

AP/M PERMAFORM
The trenchless solutions company

800-662-6465
www.centripipe.com

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