

# Case Study: Cement Mortar Lining Horizontal Concrete Pipe by Centrifugal Application



**Contractor:** Prism Contractors & Engineers

**Location:** Williamsburg, VA

**Structure:** 36-54" concrete storm drain

**Date:** November 2017



Prism Contractors & Engineers, with the help of Culy Contracting, Inc., completed a job to reline over 600 linear feet of reinforced concrete pipe in Williamsburg, VA. The pipe ranged in diameter from 36" to 52" and was leaking as a result of deterioration. Work began by using a combination of Mainstay ML-72 Sprayable Microsilica Restoration Mortar and Mainstay ML-10 Hydraulic Cement Mortar to seal voids, joints, and leaks at pipe connections. The pipe was then pressure washed to remove any contaminants and loose

material and kept saturated prior to mortar application.

After completing surface preparation, Prism utilized Madewell's horizontal mortar spinner to centrifugally apply 1/2" of Mainstay ML-72 mortar to the inside diameter of the pipe. This mortar spinner is capable of pulling heavy loads horizontally at a very controlled and slow rate of speed. The use of a cable for this application means that the pulling device is able to retract long lengths of mortar hose along with the centrifugal mortar applicator.



One challenge faced by the crew was how to determine the retraction speed needed to apply 1/2" of mortar to various pipe diameters. If the retraction speed is not carefully matched to the pumping rate, the finished mortar lining will not be of the intended thickness. Calculations for each pipe diameter were performed to determine the retraction speed required at a typical pumping rate of 100 pounds per minute. As the mortar was being spun onto the pipe, a crew member followed behind to spray water onto the uncured mortar to

assure proper cure. This method of restoration essentially creates a pipe within a pipe without the need for replacement, saving the owner time and money.