

## World Record HDD, City of Miami Beach, FL

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An existing 54-inch diameter Pre-Stressed Concrete Cylinder Pipe (PCCP) sanitary sewer force main is a vital asset for the City of Miami Beach, as it connects to the Government Cut forcemain and conveys the entire flow of the city to the waste water treatment plant on Virginia Key. However, condition assessments revealed corrosion had set in and caused failure in some of the pipe segments. Rather than removing and replacing the existing line, a new redundant forcemain was decided upon to allow repair work to occur without jeopardizing operations.

Brierley Associates designed a world record, 3,000 foot long and a 1,200 foot long, installation of 54-inch diameter HDPE pipe using horizontal directional drilling (HDD) methods. Although long reach HDD of 54-inch diameter HDPE have been previously accomplished, they were on the order of 1,000 feet.



This design/build project was successfully delivered by David Mancini & Sons, Inc. (general contractor) who retained Brierley Associates. Roger Williams (AECOM) served as project design professional representing the City of Miami Beach. Given the complexities of this installation Hard Rock Directional Drilling of Texas teamed with Spartan Directional of Louisiana.

Other unique feature of the installation include:

- Logistics of laying out and field welding of HDPE on the surface of existing roadways, which had to remain accessible
- Innovative drill fluid handling methods such as storing mud in a previously installed drill hole rather than flowing on the city roadways;
- Mixed face (soil and rock) conditions;
- Utilization of pressure relief holes during pull back to prevent hydrolock and frac- out during pull back; and,
- Drill fluid ballasting to prevent pipe buckling under differential hydrostatic pressure

Brian Dorwart of Brierley Associates designed the pipe, which was provided by Isco; the drill path and alignment; methods for overbend, buoyancy control, and differential pressure control; and evaluated the required pulling forces and pipe stresses to ensure that the integrity of the pipe was not compromised during this remarkable installation.



The success of this design-build project is attributed to a team effort, the support of David Mancini & Sons, Inc., Roger Williams and the City of Miami Beach, and the talented crews of Hard Rock and Spartan.

Please [click here](#) to be directed to [Brierley Associates YouTube](#) page. Here you can view drone footage provided by David Mancini & Sons, Inc. of the initial 3000-ft HDD drill and the pulling of the 54-inch diameter HDPE. These videos document the unique logistical challenges that were overcome by the entire team through proper planning and teamwork.



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