

NIBCO Solutions Takes on Ductile Iron Bursting in Illinois

NUCA contractor NIBCO Construction Concepts, LLC, Joliet, Ill., recently completed a difficult static pipe bursting project in Peru, Ill. The project was completed for petrochemical company Huntsman Corporation and included replacing an aging fire protection system. The project, however, could not be completed through traditional open cut construction methods. According to NIBCO Vice President Jay Boban, NIBCO was chosen to perform a trenchless rehabilitation and replacement option.



The NIBCO crew used a Grundoburst static bursting system like the one pictured here.

He said, “The ground at the facility was contaminated from a structure that once existed at the site. We were only allowed to dig in specific areas, which meant a trenchless method would need to be used to replace the existing ductile and cast iron fire protection system. We decided to utilize static pipe bursting.”

NIBCO crews used the Grundoburst 1000G static pipe bursting system from Associate NUCA member TT Technologies, Aurora, Ill.

Bursting Ductile Iron

The Grundoburst 1000G hydraulically operated static bursting system is one of six Grundoburst models. The 1000G is designed for bursting fractureable pipe, as well as ductile iron and steel pipe up to 20-inches in diameter. According to TT Technologies Pipe Bursting Specialist Ben Cocogliato, several of the system’s features make bursting steel, as well as ductile iron, possible. He said, “During the static bursting process, a special bladed roller cutting head is pulled through the existing line by the bursting unit. As the bladed rollers are pulled through, they split the host pipe. An expander attached to the rollers forces the fragmented pipe into the surrounding soil while simultaneously pulling in the new pipe.”

The specially designed bladed rollers are essential to the bursting process. The blades actually split the host pipe instead of ripping or tearing it. This makes the process very clean and prevents potential damage to the product pipe and allows it to burst steel and ductile iron pipe.

According to Cocogliato, this is a significant advancement in trenchless pipe replacement. He said, “I see this technology having a great impact on the gas and water industries. There are miles of steel and ductile iron lines throughout North America that are undersized and/or deteriorating and need to be replaced. Being able to replace and upsize these lines without digging them up, is a benefit to everyone. That really proved true on the job NIBCO did at Huntsman Corporation.”

The Job

The project at Huntsman called for the replacement of approximately 3,000 linear feet of 10-inch ductile and cast iron pipe with 16-inch SDR 9 High Density Polyethylene

(HDPE). The existing system had deteriorated past the point of functional performance and needed to be replaced to ensure proper fire protection at the facility.

Before beginning the project, NIBCO crews needed to attend a special safety course because of the contaminated soil conditions. Boban said, "Each of the participants on the project was required to attend and successfully complete a 40-hour hazardous waste operations course. During the project, workers were required to wear either no-mex coveralls or tyvek type suits depending on the soil and plant conditions we were working in. The entire project was continually monitored by an independent testing agency. All of that made the job challenging."

In addition to safety issues, the layout and condition of the existing system added to the project's complexity. According to Boban the system contained sections of ductile iron, as well as cast iron. However locations of specific pipe materials were not known until they were excavated. Plus, the system contained many repairs that also posed a challenge.

Boban said, "This project required a lot of preparation work. We would spend a week preparing to do a 300-foot run. We had many issues to consider. We had hydrants and tee-connections on the existing line and other underground utilities we needed to burst over and under on each run. That took a lot planning to make sure we did the most efficient and effective way possible."

Results

Typical bursting runs ranged from 100 to 400 feet in length. For the sections of cast iron a simple bursting expander configuration was used. Ductile iron sections required the use of the specially designed bladed rollers. NIBCO crews dug launch and exit pits on either side of the run. The Grundoburst was placed in the exit pit and the QuickLock bursting rods were placed through the existing line until they reached the launch pit. At the launch pit the bursting head and expander, and bladed rollers if needed, were attached to the QuickLock rods. The new HDPE was then connected and the entire configuration was pulled through the existing line by the hydraulic Grundoburst unit.

Once the line was installed, NIBCO crews made all lateral and hydrant connections then performed restoration work. NIBCO crews performed flawlessly and the project was successfully completed.