TRS Machine in a pit

Pensacola Concrete Combines Technologies To Complete Difficult Pipebursting Job

Pensacola Concrete was recently subcontracted by Westra to replace an aging sewer main utilizing pipebursting in St. Petersburg, FL. On the surface, the project seemed straight forward and with proper planning, a job that could be executed very successfully.

However, upon further investigation by Lyle LaForge, head project manager for Pensacola Concrete, it was discovered that the 10-inch PVC and clay pipe mains had stretches where it was encased in concrete. In addition, several of the manholes would have to be abandoned. The job suddenly went from being a somewhat challenging pipebursting project of up-sizing to 16-inch HDPE to becoming a very challenging job.

Pensacola Concrete owns a TRS-125 static machine which was initially planned for use to complete the project. With 20 years of pipebursting experience, LaForge knew it would be difficult even with 125 tons of static force to complete the project. LaForge contacted HammerHead's Jeff Wage, vice president of marketing and sales and Mark Randa, head pneumatic engineer of HammerHead. After several discussions, it was decided to combine the best parts of both static and pneumatic pipebursting technologies. Together, the high tonnage pulling force of the static machine and the pneumatic impact force of an Air Impactor would provide the kinetic energy needed to break through the manholes and concrete reinforcement.

Until a few years ago, the technology was not available to marry these two methods together. A traditional pneumatic bursting hammer is either on or off, and does not have the ability to be turned off in mid burst. The inability to turn off the hammer could have caused damage to the rods of the TRS-125 or the machine itself.

Smart hammer

Four years ago, HammerHead introduced "Smart hammer technology" in the form of the Air Impactor pipebursting hammer. This technology gives the Air Impactor the ability to start, stop and restart the tool downhole by simply applying and relieving pulling force on the hammer during the course of a burst. Originally designed for coupling with directional drills, air impactor hammers have been used with a variety of pullback systems including static pipebursting units utilizing torqued joint rods.

According to Steve Wentworth, HammerHead vice president of advanced product concepts, "pipebursting is following an evolutionary process. In the initial stage of growth, the method had been practiced at two ends of the scale of extremes. At one end is pneumatic pipebursting that uses a powerful pneumatic hammer with the relatively low tonnage towing force of a cable winch. At the other end, static rod pulling machines and their equivalents are high tonnage with no dynamic impact energy superimposed over the static force."

While these methods of very effective, pneumatic is excellent for modest up-sizes in reasonable ground when doing sanitary sewer replacement. Static also lends itself

Far left: *A pipe insertion pit.* ***Left:*** *The Air Impactor arrives.*

well to modest size water replacement. A hybrid method has some of the best qualities of each while being able to handle more adverse conditions and multiple up-sizes more effectively. This middle of the spectrum process takes the easily-handled and operated mid-size rod puller with enough tonnage to ensure that pipe friction will never be an issue and gives it the self-adapting ability of dynamic impact.

Basic physics guarantees the average force produced by a hammer increases as the going gets tougher. Should an obstruction such as a concrete pour over a patched area be encountered with the hybrid system, the static machine may 'max out,' but the hammer will continue to make progress. After the obstruction, the added pipe friction produced will be easily handled by the available static tonnage.

"It is combinations of technology rather than narrow disciplines that normally prove to have the most commercial value. The air impactor facilitates the evolution of the method by being able to operate off of virtually any pulling device, whether constant pull or cyclic in nature," said Wentworth.

System setup

Since the TRS machine has solid steel rods that cannot deliver air flow, the air impactor was converted to a rear feed unit and air supplied by a hose like a traditional pneumatic system setup. "The air impactor was designed to have the air flow either delivered from the front or the back to increase its compatibility with other static systems," said Randa.

Typically, an air impactor acts as its own bursting head. However, to complete this project, a specially designed bursting head was brought in to couple with the 12-inch air impactor. In addition to the bursting head, a pipe pilot and lube line were utilized. Manufacturer support personnel were also on hand at the job site.

As the prime contractor, Westra had to dig and shore 14 to 17 feet deep holes in the sand of St. Petersburg, FL. Once the first set of holes were finished, Pensacola Concrete was able to start setting up the pipebursting equipment led by LaForge and Ben Joyner, Pensacola Concrete's foreman on the project. The first burst was 490 feet and took approximately 3½ hours to complete. Pulling pressures on TRS-125 maxed out at 125 tons several times due to the large amount of concrete encasement on this line. Two other bursts of 338 feet were completed and both took about 90 minutes to complete. One burst of 403 feet was completed in 47 minutes and pull pressures hovered right around 35 tons for the entire burst. This burst really emphasized the force needed to get through the concrete encasement and the capability of pipebursting to get through this type of encasement.

Six more burst runs were completed on the project. "Because of the concrete encased sections, we wouldn't have been able to complete this project without the additional force of the impactor," said LaForge.

FOR MORE INFORMATION

Pipebursting contractor:
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