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Border Crossing

Matching Right Rig For The Job Ensures Success

There are long bores. And then there are really long bores.

While the definition of “long” might differ from contractor to contractor, few will dispute that a 5,000-foot drill is a very long directional bore.

That’s the length Bryan Dolan and his crews recently tackled after being hired by Wyatt’s Construction to help install an 81-mile stretch of 12-inch gas pipeline for ONEOK Inc., the largest natural gas distributor in Kansas and Oklahoma, and the third largest in Texas. ONEOK is installing a 440-mile pipeline that will transport raw natural gas liquids from processing plants in Oklahoma and the Bartlett Shale natural gas production area in north Texas to the Texas Gulf Coast.

For Dolan, president of Dolan Directional Drilling Inc., Keller, TX, he actually seeks out such work because he knows he has the equipment and the expertise to do the job. A former equipment salesman, Dolan started his company in late 2000, right before the horizontal directional drilling market hit one of its lowest points in history. Like everyone else, Dolan says he began by installing fiber optics, but as that market began to go bust, he took on whatever work he could.

“Then the fiber-to-the-premises work came along, which was a good shot in the arm, and about that time, the pipeline was kicking off in the Barnett Shale. We started doing some of that and it grew to where we changed our whole business from being

able to do small installation work to doing all gas pipeline work,” he says.

Today, Dolan Directional Drilling has the capabilities to drill bores up to 6,000-feet long and install product up to 36-inches in diameter. While the company also installs water and sewer lines, gas pipeline installation makes up at least 98 percent of their business.

In the gas industry, Dolan says most contractors either trench or directional drill. Over the years, as he has come to specialize in gas pipeline installation, Dolan has tried to set his company apart by offering a variety of installation options. In addition to HDD work, his company also has track trenchers and auger boring equipment.

"We can do directional bores, auger bores and trenching, so the gas contractor only has to call one person out to the job, instead of two or three different subcontractors," Dolan explains.

Long bores? No problem

In order to tackle the really long bores, Dolan makes sure his 70 employees have adequate equipment. For the ONEOK project, Dolan used his recently purchased Vermeer D500x500 Navigator rig to drill a 5,000-foot shot that stretched underneath the Red River, which flows east and forms the border between Oklahoma and Texas.

"It was a nice river crossing and a nice length, and it gave us the opportunity to get our 500,000-pound rig out there so that we could stretch it out a little bit," Dolan says.

The 5,000-foot bore was just one portion of the project that Dolan Directional Drilling was involved with. In all, the company will install about 40,000 feet of the 12-inch gas pipeline. Other subcontractors have been hired to simultaneously complete the other spreads.

As with any HDD job, proper planning can be the difference between success and failure. Because this bore was unique in its length and the fact that Dolan and his crews would be crossing state lines, they spent four days shooting survey and setting up their wire line grid. Once their bore plan was in place, they turned their attention to bringing in the equipment.

Crews set up the D500x500 in the middle of a rural field in Texas about 1,800 feet south of the Red River and then drilled up to the river and underneath it. "There was some pretty rough terrain and we weren't going to be able to dig on the other side of the river. That's why the bore had to be 5,000 feet long," Dolan says.

Changing soils

Typically, when contractors drill shorter bores, they encounter only one or two soil changes. But with a bore nearly a mile long with varying depths and crossing under a river, Dolan and his crews had to navigate through many different soils,

including sand, clay, sandstone, gravel and caliche.

To begin, Dolan Directional Drilling placed a mud motor with an 11-inch TCI drill bit on the D500x500 to shoot the entire bore. "The mud mix changed as the ground conditions changed, but primarily we had a bentonite mix," Dolan says.

For most of the bore, work was routine. It wasn't until they had crossed north under the Red River with just about 900 feet remaining that they faced the first real obstacle. While the soil conditions had been somewhat favorable with sand, clay and sandstone leading up to the river, they soon changed to gravel and caliche as the drill head worked its way north into Oklahoma. "We hit a gravel bed and lost our returns, so it made it challenging in trying to keep up with the mud," Dolan says. "It was difficult keeping the mud mix flowing fast enough to be able to drill, which slowed us down a little bit."

Once the bore was complete, crews attached a 22-inch backreamer and performed one pre-ream before pulling back the product. Due to the size of the rig, Dolan says a 22-inch backreamer was about the smallest size they could attach to the machine.

Unlike the drill head, Dolan's crews had to switch backreamers as the ground conditions changed. "We would ream part of the way with one type of reamer, and then push out and hook up another type of reamer and then cut for a little while," Dolan says. "We had to change reamers three times to make sure that we had the correct one for the ground conditions." He says they opted for a beavertail reamer in the clay soil conditions and a mill tooth reamer when pre-reaming through the sandstone and caliche.

After completing the backreaming, pulling through the 12-inch natural gas line didn't pose any problems for the crews. "We really didn't try out the rig's pullback force because we had a good hole and the pipe slid right through," Dolan says. "The biggest test it had was drilling the pilot bore, and it did a really good job of drilling the pilot. We didn't

have to push the rig real hard at all; it had plenty of power."

Investing in the right equipment

Dolan's equipment fleet includes a Vermeer D330x500, two D100x120s and two D80x100s. Dolan says he decided to purchase the D500x500 because it had all of the features he was looking for, such as a trailer-mounted rig; separate power unit; and high-torque, low-speed hydraulic motors. "There are few electrical components, which we really liked for the simple fact that it's much easier to work on and we don't have to worry about electrical problems," he says.

Construction contractors have heard time again just how important it is to match the right equipment to their task. But this is especially true in the trenchless industry where contractors are performing utility installation jobs of various sizes. To successfully complete longer bores, Dolan says contractors must ensure they have the correct size of HDD machine for the length of bore they will be drilling and the size of pipe they'll be installing. "It's making sure you have a good mud cleaning system and a mud pump large enough to carry your fluid at the volumes you need to complete a job that long," he says.

Dolan says he chose the right-sized drill for this job. The machine's floating top vise gripped the drill rod directly in front of the quill, helping prevent rod wrap and windup when breaking out of the upper joint. This also eliminated the need to travel the front vise up the length of the rack, thus reducing cycle times and ultimately increasing the crews' productivity.

"As far as the length goes on the pilot bore, we were glad that we had that size of rig," he says. "It gave us the confidence going into the job that we could do that 5,000-foot bore without any problems or headaches."

FOR MORE INFORMATION

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