Perfect fit

Dilden Brothers Drilling Company sticks with Atlas Copco T2W »

The dense gray dust clouds that rose up from the super single tires drifted little before settling back down on what should have been an Indiana cornfield.

The farmer who owned the section reported a 3 bushel per acre yield this year, far from enough to justify the cost of planting it. However, an orchard across the road had proven that irrigation could make the land profitable.

Dilden Brothers Drilling Company of Lafayette, Ind., used its Atlas Copco T2W Series III drill rig—the first of its kind—to create the first of two 168-foot-deep (51 m) wells bringing relief both to the thirsty ground and to the farmer, who won't have to watch the rain gauge as closely next year.

Dilden Bros. drilled the well to within 20 feet (6 m) of final depth the first day with a 17 ½ inch (445 mm) tricone, returning the next to complete it to total depth and set a 20-foot section of 100 slot stainless steel screen at the bottom beneath 12-inch (305 mm) steel casing. They backfilled the annulus around the screen with gravel and developed the well with air until it was clean and producing the maximum yield possible.

Wayne Findlay co-owns Dilden Brothers with brother Don Findlay. Wayne said about 2 feet of topsoil lay above the sand and gravel that ran to 170 feet with a static water level of 81 feet. For the most part any rain falling on the field drained too rapidly to fully benefit the crops at the surface. Fortunately there was a plentiful supply of water available. He expected the well to produce over 1,000 gallons (3,785 liters) per minute.

(above) The rig is quiet enough even while drilling, owner-driller Wayne Findlay and helper Mike McCall can easily communicate over rigs single 500 hp engine.

(left) While Wayne Findlay is most often found in the field, brother Don oversees the office side of operations. Established in 1932, the company exchanged hands when Jude Dilden retired in 1985. Coming from a large drilling family themselves, the Findlays continue to build upon the 80-year-old legacy of service to residential, commercial and agricultural customers throughout the region.

Improving along the way

The large-bore well represents just one end of the spectrum of jobs Dilden's T2W performs on any given day, and Wayne said the T2W was the perfect fit for all of the company's specialties.

The rig had just been used Friday for a residential water well. Now in the cornfield on a Monday morning, Wayne said, "Switching over to this job just means hauling a pipe trailer and taking some bigger tools." Dilden has favored the T2W for this very reason ever since it first purchased one in 1996.

When Atlas Copco was looking to update the T2W they met with drillers to seek out what improvements should be made to the T2W. As Dilden Bros. has a long history with T2W rigs, it's no surprise the company stepped forward to offer input and their desire to purchase the first T2W Series III. Wayne and Don, who worked closely with the development team, were excited by the redesigned carousel and other changes. Dilden's other rig is also a T2W, as was the one they traded for the Series III.

Atlas Copco worked with Dilden to tailor the new rig's options specifically for their operation. Though the bulk of Dilden's business had been water well drilling and installation, since about 2008 they now find they are being called upon more and more for their geothermal services. So Atlas Copco bumped up the capacity of the 3 ½-inch carousel from nine rods to 12 rods. The rig now also allows the driller the ability to backload the carousel from the rod box, allowing uninterrupted pipe handling.

"We wanted it for geothermal, for less time spent handling rod. The more you can

Technical data T2W-III

Pullback	30,000 lbf (133 kN)	
Pulldown	30,000 lbf (133 kN)	

Rotary Head

Option 1	**Option 2**
2 motor spur gear tophead, 3-speed	8300 ft-lb (11,250 Nm) @ 0 to 85 rpm
12,000 ft-lb (16,270 Nm) @ 0 to 80 rpm	6213 ft-lb (8425 Nm) @ 0 to 119 rpm
8000 ft-lb (10,850 Nm) @ 0 to 110 rpm	2850 ft-lb (3860 Nm) @ 0 to 255 rpm
3500 ft-lb (4750 Nm) @ 0 to 275 rpm	2 5/8 inch Spindle ID
2 1/2 inch Spindle ID	
Both options have hydraulic off-hole slide to the right	

Hoisting System

Main Hoist	Standard	12,000 lb (5443 kg) 150 ft/min (45.7 m/min)
	Option	15,000 lb (6803 kg) 146 ft/min (44.5 m/min)
	2 part winch line for main hoist	
Aux Hoist	8000 lb (3629 kg) with integral brake, 85 ft/min (35.9 m/min)	
	4000 lb (1814 kg) with integral brake, 120 ft/min (36.6 m/min)	
Sandreel	2000 lb without clutch	

Compressor

500 cfm/200 psi (236 L/s / 14 Bar)
750 cfm/300 psi (354 L/s / 20 Bar)
900 cfm/350 psi (425 L/s / 24 Bar)
No air compressor or air piping

Options

Water injection
On-board mud
Hydraulically operated off-board mud piping
350 gal. (1325 L) Swing up mud pit with Moyno grout pump
Floating sub spindle
DHD lubricator
Single rod loader (cannot be used with carousel)
Pipe spinner
6x6 hydraulic front drive
9-rod 4 ½" carousel or 12-rod 3 ½" carousel
Automatic Allison transmission

> “The T2W is a lot less restrictive for working with large diameter tools and casings.”
>
> **Wayne Findlay**
> Co-owner, Dilden Brothers

The swing-in carousel stows over the tower at the centerline of the truck, reassuring the driver of a balanced load. Wayne Findlay said they find the extra-wide super single tires they requested to be “more aggressive in mud and better on the highway” than duals.

do it with the rig, the better,” Wayne said. “But now we also use it in our water well applications.”

The upgraded rig’s swing-in carousel design brings the pipe over the hole, instead of moving the head to a fixed carousel. The head still moves aside to the right, for instance during case-setting, but when it’s called for, the head always returns exactly to center over the hole with perfect accuracy every time.

Then, too, Wayne said he liked how the swing-in carousel stows for transportation. It centers itself over the truck rather than to the side of it. “I have always felt that a swing-in carousel was better for the road,” he said.

Distinctly T2W

The new rig continues the T2W solid boom tower design, which provides ample clearance to perform such work as welding casing. Wayne said, “I can work around it. It’s a lot less restrictive for working with large diameter tools and casings.”

The irrigation well at this site demonstrated the T2W rig’s ability to switch quickly and easily from rotary mud to air drilling. It was a simple matter of changing a hose from the mud pump piping to the compressor and switching from the 6 $^{5}/_{8}$-inch drill pipe to working with the 3 ½-inch drill pipe that was in the carousel.

Whatever job the T2W is on, Wayne appreciated its speed: “It’s a very fast rig. Easily keeps up with bigger models.” He attributed its speed to three things: a well-designed, three-speed head; the feed system; and its rod handling. “You get the same quick feed rate from it going up as you do going down [190 feet per minute]. Not many other rigs that can say that. And this last rig, in 10 years I never had to touch its feed system.”

The rig is available with a variety of air packages. The largest is a 900 cfm, 350 psi (425 L/s, 24 bar) model. It also comes as 750/300 (355 L/s, 14 bar), 500/200 (236 L/s, 14 bar) and no air configurations.

The attraction of an automatic transmission

This is Dilden’s third T2W with automatic transmission. Co-owner Wayne Findlay said they had noticed how well their pipe and water trucks worked with automatic transmissions and made a request for it in their 2001 T2W. He said Dilden hasn’t had one bit of trouble, not in three drills rigs since then. As for those who “had drive line and rear end fears,” Wayne said reality proved them all to be “myths.” Maintenance has amounted only to changing the oil on schedule. With a manual transmission, Wayne said he’d eventually have to service or replace the clutch.

Wayne said the transmissions have made a huge difference: “On the road it out-accelerates a manual transmission. Shifts are fast and smooth. In high-drag situations, such as a soft field, it will upshift and downshift very fast, unlike a manual transmission that can be nearly impossible to shift without coming to a stop. And you can back in slowly, not have to ride the clutch.” Plus, he added, anyone can drive it—it doesn’t require a driver experienced with shifting a manual transmission.

Lyndell Pannell is fleet account representative for Southwest International Trucks Inc. and is a proponent of the Allison automatic transmission. He believes they are safer to drive because the driver is concentrating on the road rather than operation of the vehicle.

He said, “They also increase productivity. The reliability is unsurpassed by anything in the industry. The transmission is smart with respect to maintenance. It has prognostics which actually tell you when it needs service so you can avoid over- and

(right) On this irrigation well job Dilden Bros. crews switched deftly from 6 5/8-inch pipe on the trailer to 3 ½-inch pipe on their 12-rod carousel in moments. The extra-capacity carousel, which can be back-loaded for uninterrupted pipe-handling, was intended originally for drilling geothermal installations. However, Dilden Bros. has found it useful in other applications as well, providing quicker tripping as it did to develop this 12-inch irrigation well.

Truck options

Dilden got exactly the rig they wanted by knowing exactly what they wanted. John Baker, who has worked at Dilden's for 22 years now, said that's because Wayne, his boss, actually drills on the rigs. He admires him for working alongside his men, but said also, "What's nice about working for an owner who drills himself is that it means we always get the good stuff."

As for the carrier, Dilden was pleased with Atlas Copco's accommodations. "Once again," Wayne said, "they made a special truck for us, just the way we wanted it."

An Allison automatic transmission is now an option for T2Ws in the no-air and 500/200 versions. It is currently required for 750/300 and 900/350 air models, though Atlas Copco plans to offer a manual transmission for the 750/300 air model in the first quarter of 2013.

Dilden's rig also has the optional hydraulic front axle assist, which gives the driver near all-wheel-drive capability without raising the truck height. Wayne said they decided to go with super single instead of dually tires on the rear. There are many other options on the T2W including mud pumps, pipe spinner, sand reel, water injection, service hoist and more.

It took a while to customize the rig exactly to Dilden's specifications and get it tuned just right. But Wayne was pleased with the results. He said, "Since we got it all dialed in correct, there hasn't been a problem at all." It has been running smoothly, and cool: "The cooling is fabulous, thanks to that large radiator."

Tom Moffitt, U.S. sales manager for Atlas Copco water well drilling rigs, said, "We were very willing to do all of these things for Dilden Bros. on the T2W," noting that Wayne and his crew's feedback has been instrumental in making a rig that has always been popular in the Midwest even better. Many of the features Dilden Bros. requested for their rig, Moffitt said, are standard options now that make the T2W appealing to a wider customer base.

under-servicing the transmission."

The automatic transmission allows the engine to operate at a lower rpm, which results in better fuel economy. Pannell also pointed out that safety features can be programmed into the transmission based on the application. He said, "The initial cost of the Allison is offset over time by the decrease in driveline and clutch and transmission related failures. Once you get past the initial upcharge it is just a better and smoother product."