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## Conduit Drilled Under River

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# Conduit Drilled Under River



*Henniker Directional Drilling  
installs HDPE pipe under  
Connecticut River between  
New Hampshire and Vermont*

■ *By Paul Fournier*

**Above right: More than 1,100 feet of conduit is installed under Connecticut River between Cornish, N.H., and Windsor, Vt.**

**Below: Henniker Directional Drilling uses a Vermeer drill to bore hole for conduit under subcontract to East Coast Utilities.**

**A**n important communications conduit was speedily installed under the Connecticut River between New Hampshire and Vermont recently with the use of horizontal drilling technology.

“Verizon wanted to install a backup fiber optic line across the river,” explained George Burns, job superintendent for East Coast Utilities Corp., the Pembroke, N.H.-based general contractor.

“One method they could have used was to hang the conduit on the historic covered bridge between Cornish and Windsor, but they decided that placing the pipe under the river by directional drilling was a better alternative.”

East Coast Utilities called on Henniker Directional Drilling L.L.C. (HDD) to perform the drilling.

“It was more than 1,100 feet, so we decided to use our biggest directional drill for the job,” said Jeff Martin, president and co-owner of the Henniker, N.H., company. “The Vermeer 50x100 Navigator has 50,000 pounds of pull-back force and 100,000 pounds of torque – more than enough power for this job.”

Henniker’s equipment consisted of four major units: The Vermeer drill, a Surface To Surface (STS) 1500 mud mixer carried by an Autocar flatbed truck, an American Augers mud recycler and a Mack truck with a 3000-gallon water tank.

During a typical drilling operation, the 1,500-gallon STS unit mixes bentonite clay and water to initially produce a slurry (drillers’ mud), which fills the drilled hole and prevents the sides from caving in as drilling proceeds. The American Augers recycler forms a closed circuit with the drill, capturing used slurry and re-feeding it to the drill. The crew adds makeup water from the water



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**Above: HDD owner Jeff Martin mixes drillers' mud in American Augers recycler.**

**Below: Mud recycler, center, is connected in a closed circuit with Vermeer drill at right, while at far left is STS 1500 mud mixer.**



tanker to the circuit as needed for the process.

Martin and his drilling crew set up their equipment on the Cornish, N.H., side of the river on July 10 of this year, and began drilling the next day. With the river bank topping out at about 30 feet above mean water, the crew set up the machines far enough inland so that the drill steel at the water's edge would be at least five feet below the river bottom. In the middle of the river, the steel was approximately 30 feet beneath the bed.

A 4-1/8-inch-diameter Railhead bit was used to drill the hole. Because of its angular shape, the bit actually produced a hole diameter of approximately 8 inches. As the Railhead advanced, 15-foot lengths of 3-inch-diameter hollow rod with male-female threaded ends were added. Inside the Railhead is a Sonde radio transmitter that sends signals to a hand-held receiver. This enables the drill operator to know precisely within inches the location, pitch and direction of the bit at all times.

Two crews are used for the process - one at the drilling machine end and the other on the exit pit side. Drilling crew and exit crew communicate with each other using Motorola two-way radios.

Three 500-foot coils of 5-inch high-density polyethylene (HDPE) pipe were ready on the exit pit (Vermont) side, together with a McElroy Fusion machine. The machine would be used to join the coils together and produce 1,135 feet of continuous conduit that would be pulled back through the hole to the New Hampshire side.

When the Railhead poked through to the surface, the crew removed the bit and added a 10-inch Ditch Witch reamer to the steel, plus a swivel, and connected the coil of 5-inch HDPE to the swivel. Then the driller on the Cornish side began the pullback procedure. As the drill steel was pulled back, the Vermeer drill automatically loosened and removed each 15-foot length.

In addition to the river crossing, the Henniker firm drilled and installed about 40 feet of conduit beneath nearby Route 12A.

The entire drilling operation, including equipment setup and breakdown, took approximately 12 working days, according to Martin.



**A 500-foot coil of 5-inch HDPE conduit stands ready to be fused with a second coil.**

## Conduit Drilled

East Coast Utilities is responsible for the installation of precast concrete hand-holes at each end of the conduit and for running conduit to telephone poles. The firm specializes in underground gas and telephone line installations for utility companies. According to Burns, East



Coast is currently engaged in several large projects, including one on Candia Road in Manchester that calls for the installation of between 5,000 and 6,000 feet of 24-duct conduit and 22 manholes.

Henniker Directional Drilling was established in 2001 by co-owners Jeff Martin and Rick Patenaude. Martin



formerly worked for Ingersoll-Rand in Southboro, Mass., for 14 years, while Patenaude owns Contoocook Artesian Well Company, which has been in business since 1936. Four employees complete the staff: Danielle Martin, Jeff Martin's wife, office administrator; and the drilling/pipe crew comprised of Charlie Hunt, Tom Fisher and Curt Boutwell.

Most of their drilling work is performed for contractors who install underground water, sewer, gas and electric lines. Besides the Vermeer 50x100 drill, the company owns two Tulsa Rig Iron drills – a TR40 with 40,000 pounds of pullback and a TR14 with 14,000 pounds of pullback.

**Above: Contractor uses a McElroy Fusion machine to produce a 1,135-foot string of conduit.**

**Left: Conduit is connected with swivel joined to 10-inch Ditch Witch reamer prior to being pulled back through hole.**

Martin commented that while they are a new company, business picked up quickly from the start and has been steady.

“Our third year in business is turning out to be a great one. We have a lot of work ahead of us, and the jobs we’ve done have been 100 percent successful,” he said. □

**Above: HDD crew positions HDPE pipe for pullback procedure.**

**Right: Drill operator Charlie Hunt uses Motorola radio to speak with crew across river as they prepare for pullback.**

