September 2000

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Island Hopping

Long Cable Bore Requires Drilling From Island To Island

by Jeff Griffin, Senior Editor

Texas contractor Mickey Redwine has a reputation for taking on especially challenging and difficult directional drilling projects.

HDD crews of Redwine's firm, Dynamic Cable Construction Co., has completed many high-profile projects over the years, including wiring the New Orleans' French Quarter and Central Business District with television and fiber optic cable, a 6,600-foot-long crossing of the Potomac River, near Washington DC (one of the world's longest utility bores), and completion of a project in Mexico that local residents said was doomed to failure because of an ancient devil's curse.

So when Dynamic Cable personnel had to live on a barge, fight swarms of gnats and mosquitoes, and guard against snakes as big around as a man's leg while making an island-to-island bore in a Louisiana lake, it was all just part of the job.

The Qwest Communications cable route went through the Rigolets Pass in Lake Catherine, northeast of New Orleans near the city of Slidell. The installation involved a segment of a fiber optic telecommunications link between Houston and Jacksonville, FL.

"Most of the conduit was installed along railroad right-of-way using plow equipment mounted on railroad cars," explains Wayne Davis, manager of Dynamic Cable's drilling division. "A bridge extends across Lake Catherine, but there is a swing span in the middle that prohibited attaching conduit to the bridge."

HDD solution

Construction options were to jet the duct under the lake bed, or to directional drill. The channel on the east side of the pass takes a deep, winding course and has almost vertical slopes. These features, along with a treacherous current, made a jetting operation virtually impossible, says Davis, making the best recourse a 5,000-foot-long bore between the two islands.

Moving equipment into position for the bore was in itself a major undertaking; reaching the island site is a 45-minute boat ride on calm waters, and many times the lake was too rough to traverse.
"We arranged for three barges from the Pearl River Navigation Co.," says Davis. "One contained sleeping quarters, a kitchen, and supported a 75-ton crane. The second was used to transport the 65,000-pound Contractors Manufactur- ing Services CMS 180 drill rig, a Tulsa Rig Iron mud system, a swamp excavator, and other pieces of specialized equipment and supplies, including plenty of insect repellent. The third barge transported drill pipe and wooden mats to build a road to support the drill rig as it was moved into its set-up position. Because the lake water was considered too brackish for drilling fluid, the barge also brought numerous loads of fresh water."

The barges docked at the island, wooden mats were unloaded, and a road built to a point about 175 feet from the shore where the drill rig would be set up. The crane unloaded equipment and everything was carefully moved across the road to the set-up spot.

“Our plan,” says Davis, “was to make the bore with 5-inch diameter drilled out pipe which would be left in place so that conduit for the fiber cable could be placed inside the pipe.” The procedure would simplify the project by eliminating the pull back of casing.

“We had used this procedure many times,” says Davis, “and it seemed the best approach to take on this project.”

Complications

However, 4,400 feet into the bore, the drill stem twisted off and the bottom hole tool assembly and 600 feet of drill pipe was lost. Davis says the various soil formations that were drilled through, including sand, gravel and a shelf of rock all contributed to the twist off. But the primary factor, he says, was Blue Marrow clay.

“Drill string torques would be normal one minute and the next minute we would be stuck,” he adds. “Many different variations of mud weights were tried as well as several different additives.”

After the twisting off, a decision was made to drill with the brackish lake water because it was more compatible with the native clay which helped keep swelling to a minimum. On the down side, brackish water rusts equipment.

“We backed out, brought in a new load of pipe, and started over,” says Davis. “The second time we made a pilot bore with premium-grade 5-inch double white band pipe. We barged 5-inch drilled out pipe to the second island and when the pilot hole was complete, tripped back, and pulled the drilled out pipe through the pilot hole. A steel cable was blown through the pipe and three 1 1/4-inch ducts for the fiber were attached to the cable and pulled the length of the casing.”

The bore had to be maintained at a depth providing 40 feet of cover to the lake bottom. At its deepest point, its depth reached 120 feet. Average depth was 70 feet.

The CMS 180 drill rig produces 200,000 pounds of pullback force and 38,000 pounds of torque. The mud system produced 500 gpm and Sharewell personnel using a Tensor wireline steering tool provided guidance services.

Mobilization, drilling, pullback and moving equipment from the job site required 25 days.

With headquarters in Denver, Qwest operates a high-speed broadband network covering more than 25,500 route miles in the United States and extends 1,400 miles into Mexico. Ventures are also under way in Europe. Dynamic Cable Construction Co, Inc., based in Ben Wheeler, TX constructs long-haul and metropolitan turnkey telecommunications projects and does other types of underground construction throughout the United States.

“Sometimes,” adds Davis, “we even do simple jobs.”