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Mountain Pass Drilling: Contractor Beats The Snow To Install Fiber In Washington

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By Jeff Griffin, Senior Editor, Underground Construction

Contractors involved in horizontal directional drilling (HDD) often must work through difficult projects, many with unexpected challenges. However, Oregon contractor Apex Directional Drilling has a history of seeking out complex projects that other HDD specialists are reluctant to take on.

A recent example is construction of a 71-mile segment of fiber optic cable – 37-miles of the project was underground in the Cascade Mountains of northeast Washington.

The project owner was the Northwest Open Access Network (NoaNet), Spokane, WA, a wholesale-only fiber backbone carrier that provides high-speed network connectivity to telecommunications companies, Internet providers, application service providers and cable companies throughout Washington state.

Apex was the general contractor and completed the underground segments. Aerial portions were subcontracted to Henkels & McCoy, said Scott Gagner, Apex project manager. The route of the project was along State Highway 20 from approximately 15 miles west of the town of Kettle Falls, WA, and ending in Tonasket, WA.

Gagner said of the 37 miles of underground inner duct, approximately 110,000 feet -- 21 miles -- was installed by horizontal directional drilling, with 100,000 feet installed through solid rock ranging in hardness from 15,000 to 30,000 psi. Excavation and vibratory plowing were used on the remaining portions of the underground work, primarily in areas where soil was softer and the terrain allowed space for equipment.

Starting at the top

Gagner said the plan called for construction to begin at Summit Pass which, at 5,700 feet, is the highest mountain pass in the state of Washington to stay open year round. From there, the work would proceed east, completing the highest and most difficult elevations before the first snowfall.

“Apex Directional Drilling was the first to install any underground utility over Sherman Pass,” said Gagner.

For HDD segments, Apex used relatively compact Ditch Witch All Terrain (AT) equipment which employs a dual-pipe mechanical drilling system, rather than larger machines with mud motors. This decision eliminated the need for support equipment required for mud motors and greatly reduced the volumes of drilling fluid needed for operations. Apex has successfully used this technique on projects in similar conditions.

The system employs an inner rod to drive a rock bit, and an outer pipe steers the downhole tool for drilling pilot holes and provides rotary torque for backreaming. It is designed to deliver maximum downhole horsepower to the bit. The system also enables simultaneous drilling and steering through rock and rocky soil while requiring no more drilling fluid than conventional equipment.

All HDD equipment on the project was AT models -- mud motors never were used. Directional drilling was the only feasible method to use in many areas where the roadway had no shoulders and there was no room for excavation or plowing equipment to operate.

Construction began in July 2012 with two Apex-owned, 30,000-pound pullback JT3020 AT drills and a backhoe crew for tie ins, said Gagner.

“Over the next two weeks the project blossomed to nearly full capacity as we employed seven of our own drills (six JT3020s and one 100,000-pound pullback JT100 AT) and three subcontractors, each with one HDD unit,” Gagner continued. “We were installing 1 1/4-inch SDR 9, ribbed inner duct to house the fiber optic cable. With duct in place, cable was installed hand-hole to hand-hole by Apex subcontractor Precision Fiber.”

Once the East side of Sherman Pass was completed, Apex and subcontractors descended off the west side of the mountain and moved equipment into position for building the western segment.

Gearing up

At the projects' peak, 12 drill crews, six backhoe crews and two plow crews were used. APEX was able to complete all work most likely to be impacted by winter weather before the snow arrived.

Said Gagner, “Over the course of the five-month fiber build, approximately 360 individual drill shots were completed, the shortest bores measuring 60-feet in length while the longest bore measured 1,480 feet. The average bore length on the project was 300 feet.”

Walk-over electronic tracking equipment was used on all HDD installations.

In addition to difficult surface terrain and rocky subsurface conditions, access to work areas was difficult.

“Highway 20,” said Gagner, “is a two-lane road through mountainous country, with minimal shoulder room for construction equipment. Extensive traffic control set-ups were required for nearly all underground work performed, usually consisting of two flaggers, one pilot car and one supervisor. Traffic control was subcontracted to Altus Traffic.”

The last bore and conduit installed was completed just before Thanksgiving Day 2012.

The Summit Pass job is a part of a project which, combined with others, is expanding Noanet’s fiber network to reach more than 170 communities and 2,000 schools, hospitals, emergency responders, libraries, colleges and universities in Washington. Funds for the projects are bolstered by $140 million in federal grants.

Based in Portland, OR, Apex works on a national level serving multiple clients. With equipment ranging to 500,000 pounds of pullback, Apex has the ability to bore up to several thousand feet and pull products in excess of 48-inches in diameter. Some single projects are hundreds of miles long, and others are a few hundred feet. Apex is licensed in all states west of the Rocky Mountains and also in Pennsylvania, Missouri, Virginia and North Carolina.

FOR MORE INFO:

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