

Crux drills into new growth arena **Company builds power tower foundations at remote sites**

By TREVA LIND
Of the Journal of Business

Crux Subsurface Inc., a Spokane Valley-based geotechnical exploration and construction company, has drilled into a growing segment of its business that involves building transmission line foundations on rugged and often environmentally protected properties.

While the company remains steady in its core “difficult-logistics” geotechnical soil and rock core drilling—work that’s often helicopter assisted for delivering

workers and equipment—the company is growing its power transmission line project work. Crux currently has six contracts either in process or awarded for jobs that involve designing and building specialty piling foundations for transmission towers.

Most of these new contracts are in California—including one for Southern California Edison’s Devers-Palo Verde No. 2 transmission line that is expected to start in March. These types of jobs typically have an average contract amount of \$5 million to \$8 million, says Scott Tunison, Crux vice president.

For the Devers-Palo Verde project, Crux is expected to complete a total of 32 lattice tower foundations using helicopter-assisted construction, mainly for two new transmission lines. One 111-mile line will link the Devers substation near Palm Desert with another substation near Blythe in Riverside County. Another 42-mile line

will connect that Devers substation to one in the city of Menifee.

This growing work for Crux is expected to help push the company toward an anticipated 40 percent revenue growth this year over 2011, says

Mark Neupert, Crux vice president

of business development. Last year, Crux saw a 50 percent increase in revenue as compared with 2010, he says.

Crux also added 14 new employees this past fall because of increased workloads, for a total 110 workers. The company says about 72 of those workers are Crux employees who are out in the field at job sites, while 38 are based at the company’s leased 20,000-square-foot building and 6-acre yard, at 16707 E. Euclid, and at a nearby leased 4,500-square-foot building.



Micropile foundation installation for the Swan-Tyee Intertie in Alaska

Although the company's lease for its Spokane Valley headquarters building expires in 2013, company President Nick Salisbury says the company has no plans to relocate outside of the immediate Spokane region.



Performing geotechnical exploration work utilizing a Crux-owned specialty barge

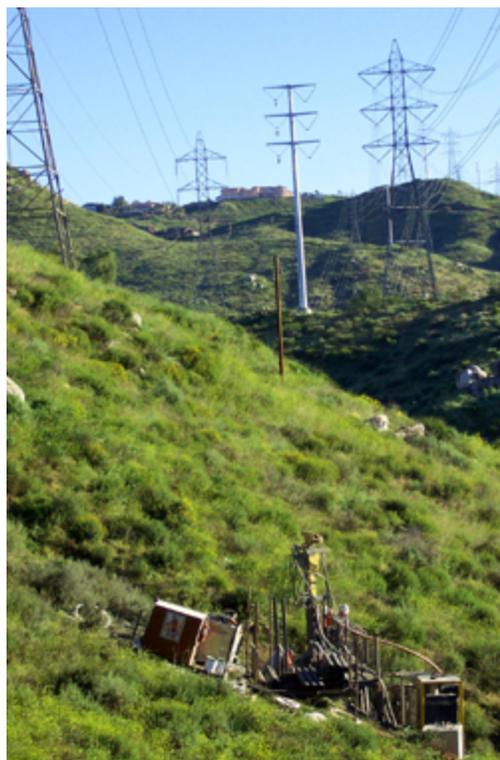
The company has grown in recent years as a leader in the design-build of what are called micropile foundations for transmission lines that require minimal land disturbance, Salisbury says. It has developed an expertise in doing this work at environmentally sensitive or constrained-access sites, such as in steeply sloped canyons, using its specialized drill equipment, helicopter-assisted delivery, and structural designs, he adds.

Salisbury says that for the past year, the company has had a heavier focus on the transmission foundation work, and expects "major expansion" as the U.S. updates an aging power infrastructure. California is a strong focus because of remote solar and wind power sites that need to be connected to major power grids to push that state toward its 33 percent renewable energy goal by 2020, he says.

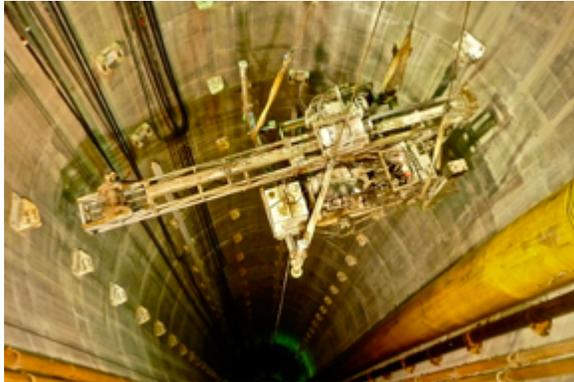
"We're capturing a lot in our niche geotechnical drilling, but also because the transmission market as a whole is expanding rapidly and is expected to through 2020," Salisbury says.

He adds, "That industry is growing. The U.S. has an aging infrastructure that has to be replaced, and with the added electrical demand and renewable energy emphasis for wind and solar, when new wind or solar farms are built, those are in regions typically in more remote areas and in areas that can have challenging terrain."

He says that the wind farms—at least in California—are often located in steep canyon regions, while the solar-based technology is grounded on desert floors that are separated from large metropolitan areas by mountain ranges. Crux has its own Spokane-based five-person engineering team that designs transmission tower foundation systems to adapt to the load and geotechnical conditions, Salisbury says.



Installing micropile foundations for the environmentally-sensitive Miguel-Mission transmission line in Southern California



Custom-designed drill being lowered into tunnel shaft

“The utilities have to get that energy back in to the grid and across these major mountain ranges,” Salisbury says. “Many of those mountain ranges are also environmentally protected.” He adds that most of this acreage is overseen by agencies such as the Bureau of Land Management or the U.S. Forest Service that require minimal construction impacts.

“As opposed to constructing roads in order to allow for construction, they want to see minimal impact specific to the tower location,” Salisbury adds. “That’s where our market is.”

The new transmission line sections typically range in length from 50 miles to between 100 and 120 miles, but some are as long as 400 miles, he says.

Tunison says job sites can have as few as eight people and as many as 75. The company doesn’t employ helicopter pilots, but instead subcontracts helicopter services from “a long list of companies,” he says.

Crux started in 1998 with a focus on extracting below-ground material samples in challenging environmental sites such as steep banks. The company declines to disclose its current ownership structure, but Salisbury has headed up Crux from the start.

One of its largest geotechnical exploration jobs to date included more than 10,000 feet of exploratory drilling in steep terrain to aid in the design of the Hoover Dam Bypass Project and supporting structures, about 30 miles southeast of Las Vegas.

Tunison says the company’s geotechnical jobs remain strong, and typically have average contract amounts ranging from \$20,000 to \$5 million. The samples that Crux collects at sites are analyzed by engineers for future construction, oftentimes for a bridge, dam, or tunnel.

“It helps avoid expensive change-order issues that can be encountered in difficult environments,” Tunison says. “We acquire the data, the soil and rock profiles, and incorporate that in the bid contract.”

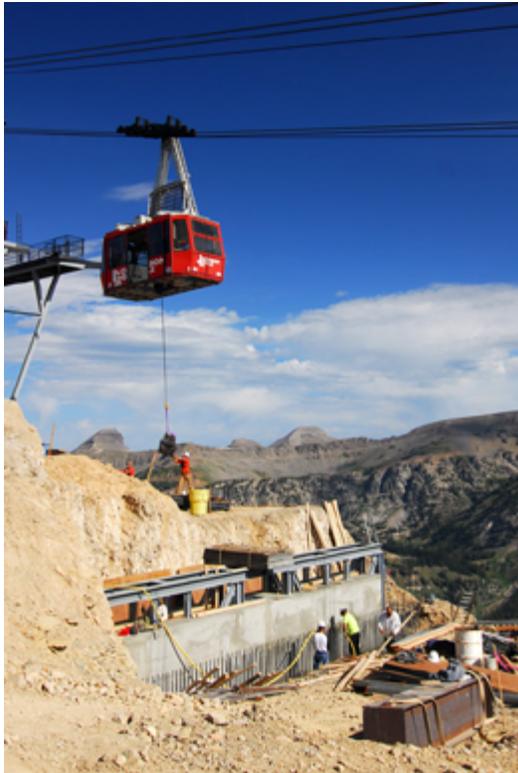


Completing micropile foundation work for 230 kV transmission line crossing Ebey Slough

Neupert says the company’s geotechnical drilling at sites sometimes goes beyond that scope of work to include bank stabilization work or tunnel construction stabilization jobs.

“Our niche is essentially difficult access,” he says. “There are probably several hundred companies that do geotechnical work. We’re one of the few that do it with helicopter-assisted drilling equipment.”

Some of its geotechnical drilling also is done with specialty drilling equipment loaded on barges, he says, including for a job undertaken for the Southern Nevada Water Authority to build a new water-supply tunnel farther out and deeper in Lake Mead's channel. Crux completed many phases of land-based and offshore drilling there to get samples.



Micropile foundation construction for Jackson Hole Tram project

Its first transmission line foundation project in southeastern Alaska started in 2004. That involved designs for tower locations along a 57-mile transmission line connecting the Swan Lake and Tye Lake hydroelectric facilities, north of Ketchikan, Alaska.

Each tower location for that project had between one and six foundations, supported exclusively by micropiles, which are groupings of several slender, vertical steel pipe casings, grout and high-strength rebar. These are all tied together

with a Crux-designed steel or concrete cap. Crux used lightweight, helicopter portable drill rigs designed for efficient and environmentally sensitive setups at foundation locations, which varied from wetland swamp conditions to nearly vertical ridge-top locations. The line went into service in 2009.

The company's drilling platforms for construction work also are designed to sit on four corner posts for minimal ground impact, Neupert says.

Additionally, Crux has developed 10 patent-pending, custom designs for what it calls Crux-Beretta spin drills, which are micropile drills used in difficult access job sites. Work also has started on a new truck-mounted geotechnical drill, the company says.

Since 2003, Crux has operated a small company division called Inland Pacific Drill Supply that manufactures drill rods, casings, and tubular steel products among other equipment mainly for use by Crux. Salisbury says it's a growing division that also does some outside selling to drilling contractors in multiple markets, including environmental drilling, geotechnical, and mineral exploration. Its eight employees work out of a shop in the back of the main headquarters building.

The drill development is a combination of fabricated and utilization of pre-fabricated components, he says, adding that "we configure those components for our own uses in ways that facilitate our specific needs."

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