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CTL|THOMPSON PROVIDES GEOTECHNICAL ENGINEERING EXPERTISE TO THE MOST REMOTE NAVAL BASE IN THE WORLD

(DENVER – June 1, 2019) CTL|Thompson, a full-service geotechnical, structural, environmental and materials engineering firm based in Denver, is providing geotechnical expertise and engineering solutions for U.S. Navy satellite communication projects on the small atoll of Diego Garcia, located just south of the equator in the British Indian Ocean Territory.

CTL is no stranger to this remote island. Its materials testing division was integral to the development of facilities built to support military operations at the height of the war in Afghanistan in 2002. Now nearly 20 years later, the U.S. Navy has asked for CTL's unique expertise again. This year's project includes geotechnical testing and consulting for the expansion of a communications facility on the island. In total, the Navy is building nine new antennas and radomes — structural, weatherproof enclosures that protect the radar antennas.

Spencer Schram, Geotechnical Department Manager of CTL Fort Collins, led the geotechnical investigation.

"The location presents a work environment unlike anything in the world," said Schram. "But with past experience from CTL's Senior Principal Engineer Jeff Groom, who led our first efforts in Diego Garcia, and our broad range of geotechnical experience, we were able to design a winning solution."

One of the greatest challenges was logistics planning, according to Schram.

Diego Garcia is located 1,000 miles from the nearest continent. Most large equipment, including a track-mounted drill rig, had to be shipped from Sacramento, California, to Singapore and then sealifted to Diego Garcia.

The complexity of the geological conditions also presented new challenges for Schram. Subsurface conditions on the island's interior are primarily sand and gravel made from eroded coral, while the seaward side of the atoll consists of fossilized coral, an extremely hard material. In addition, Diego Garcia is subject to earthquakes, with the region's largest earthquake to date, recorded in 1983, measuring 7.6 on the Richter scale.

CTL used a mud-rotatory technique to log the subsurface conditions and collect samples for testing. Mud-rotatory involves the use of a bentonite slurry mix that is pumped into a casing to help advance the drill bit and keep the hole from collapsing. Portions of the site were located within the jungle, which made mobilization difficult. CTL teamed up with a local contractor to help lay down mud mats on the soft, saturated soils to allow access to the boring locations. And water had to be pumped as far as 100 yards to create the bentonite slurry mix.

After this complicated testing, Schram recommended a deep foundation using auger cast piles, driven piles and Franki piles, a unique deep foundation developed in Australia. The approach would mitigate potential distress to the antenna and radome structures.

Before wrapping up on the island, the CTL team was asked to spearhead geotechnical testing on two additional projects — a wind farm to produce electricity for the island and a seawater air-conditioning pump station to extract cold ocean water to act as a coolant for the naval base.

“Success on this project was only possible due to the depth and breadth of experience on the CTL team and the support from our client, the U.S. Navy. While the island conditions are extraordinary, we truly enjoyed taking on the various challenges,” said Schram.

About CTL|Thompson
CTL|Thompson is a full-service geotechnical, structural, environmental and materials engineering firm. Established in 1971, the firm employs 255 technical and nontechnical employees and provides expertise in small and large-scale projects in all areas of construction. CTL|Thompson is headquartered in Denver and has offices throughout Colorado in Fort Collins, Pueblo, Colorado Springs, Glenwood Springs and Summit County as well as in Cheyenne, Wyoming, and Bozeman, Montana. For more information, please visit www.ctlt.com.

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