Soil Mixing for Very Large Shafts In Dune Sands

Crews use a Hain Crane Mount on a Liebherr HS 895 Crane to drill 13-ft-dia foundation shafts for a fly-over structure.

The under-construction State Route 4 Interchange Improvement Project near San Francisco, Calif., will improve traffic flow through Contra Costa County's major transportation corridor. Vital to the project is the construction of three new fly-over structures.

Malcolm, under contract with RGW, is currently helping the Contra Costa Transportation Authority (CCTA) in its freeway widening effort by installing a series of 8-ft and 13-ft-dia, over 110-ft-deep drilled shafts that will serve at the foundation for the fly-over structures. A few of the foundation shafts are precariously close to active traffic requiring complex project coordination with the CCTA.

Before shaft drilling could commence, Malcolm mobilized a 300-ton Liebherr Crane to install the large rebar cages and corrugated metal pipe (CMP) casings to a depth of 60 ft—an impressive sight for commuters. The location of all three bridge foundations involves working with very dry and loose overburden material and the implementation of a uniquely designed 15-ft-dia support ring to stabilize the 13-ft-dia drilled foundation shafts. In addition, single point soil mixing to a depth of 40 ft was used to stabilize dune sand material and minimize the potential for catastrophic ground failure close to active traffic.

"The SR4 widening project is not a typical project and requires complex solutions in respect to safety and ground control," comments David Walker, Malcolm's project manager.

The project is expected to be finished and operational by either late 2015 or early 2016. ■