

CONSTRUCTION DRILLING PRODUCTS

CASE STUDY



PROJECTS: **Loop 202 (Red Mountain Freeway) - Widening from SR-51 to Loop 101**
Loop 303 - New Four Lane Divided Highway
Stafford Bridge Replacement
Interstate 10 - New Traffic Interchange

OWNER: Arizona Department of Transportation (ADOT)

LOCATION: Tempe, Mesa, Phoenix, Peoria, Stafford & Marana, Arizona

CONTRACTOR: Case Foundation Company

PRODUCTS: SHORE PAC®, SAND SEALANT/MULTI-SEAL™, SODA ASH, SLURRY BUSTER™

Case Foundation Company has encountered and solved a number of substantial challenges during their 2009 work for the Arizona Department of Transportation (ADOT). Cumulatively, these four projects were comprised of over 200 large diameter shafts with depths ranging in the hundreds of feet. To add complexity, the Arizona geology presented a wide range of difficult formations including: boulders, cobbles, loose gravels and sands. On projects such as the Loop 202, these difficult geological conditions were further compounded by the close pier proximity to the Salt River and the presence of a matrix material from previous construction.

On all four of the projects, the shallow ground water in combination with these unstable formations made it impossible to drill using conventional dry methods. Unlike dry drilling methods, wet holes rely on a combination of factors to maintain the stability of the excavation. Of these factors, SHORE PAC® polymer slurry is the most critical in maintaining hole integrity. In order to have an adequate supply of slurry, Case Foundation had to mix, recycle, house and distribute roughly 6.9 million gallons of SHORE PAC collectively.



CETCO begins every project by creating a detailed, site specific SHORE PAC slurry program during the bidding phase. This guide helps to accurately predict not only the overall cost, but also provides in depth instructions for: mixing, tank farm construction, plumbing, recycling, and additive usage. An accurate bid is essential, as unforeseen obstacles can cost a great deal of time and money.

To ensure proper SHORE PAC polymer performance, CETCO performs complementary water testing in our state-of-the-art laboratory, located in Hoffman Estates, IL. On the Loop 303 project this became critical as it eliminated the need for potable water to be constantly trucked to the jobsite. The ground water testing ultimately saved Case Foundation a substantial amount of money.

In order to house the 6.9 million gallons of slurry, Case Foundation relied upon CETCO to help design an efficient tank farm. Each of the four tank farms consisted of six Baker tanks, with the capability of distributing, recycling, returning and transferring slurry to and from any tank. This setup was made possible by the use of centrifugal pumps. SHORE PAC's high molecular weight allowed the slurry to easily flow through centrifugal pumps with minimal impact on the viscosity of the polymer. This enabled Case Foundation to pump the slurry long distances, which in turn reduced the time and labor required to move the tank farms.



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During the drilling process, SHORE PAC was a critical factor in maintaining excavation stability and promoting auger spoil loading. The high cohesive properties of SHORE PAC helped to bind excavated soil and gravel for increased stabilization and rapid spoil removal.

Due to the difficult geology of the region, numerous zones of porous and unstable material existed within the strata. When Case Foundation encountered these problem zones they were successfully able to prevent fluid loss and collapse by adding SAND SEALANT/MULTI-SEAL™ directly at the hole.

At each of the job sites, Case Foundation found themselves in close proximity to rivers or other natural bodies of water. During the Loop 202 project the pier locations generally followed the path of the Salt River. While on the Loop 303 project, the flowing Aqua Fria River posed a significant threat to the stability of the holes. In Safford, AZ the majority of the pier locations were located in the heart of the Gila River. The ADOT, in combination with local environmental organizations, were initially concerned about possible contamination of both the river water as well as the local ground water. After thorough review, SHORE PAC proved to be the perfect solution due to its environmentally friendly chemical composition. OSHA, in conjunction with independent testing facilities, have deemed SHORE PAC as both non-toxic and non-hazardous.

The ADOT and Case Foundation also expressed concerns regarding the disposal of SHORE PAC polymer slurry. Unlike mineral slurries, the disposal process for SHORE PAC is simple, quick and easy as the product is readily degradable. Upon completion of the project, any remaining SHORE PAC was broken down with the chemical oxidizer, SLURRY BUSTER™, which reverted the slurry back to basic water. Case Foundation was able to then use this water for dust control.



Case Foundation has relied on SHORE PAC to not only maintain the integrity of the excavation, but to produce a quality finished product free of anomalies. When fines suspended in a slurry interface with the concrete during the pouring process, it often creates anomalies which compromise the structural capacity of the shaft. Because SHORE PAC polymer slurry is non-gelling, even at high viscosities it does not suspend sand and other fines. SHORE PAC can be considered self cleaning and can be recycled by pumping the slurry back to a holding tank as it is displaced during the concrete pouring process. Case Foundation was able to reuse over 3 million gallons of SHORE PAC, saving them over one hundred thousand dollars in product. When compared to mineral slurries, SHORE PAC provides a more economical and cost-effective solution.

Case Foundation's confidence in CETCO's SHORE PAC polymer slurry, additives and engineering services, enabled them to accomplish their goals both on time and under budget. SHORE PAC is one of the biggest factors in creating a successful quality project, yet is one of the least expensive tools of the trade. But just like any other tool it requires proper training, implementation and support.

Case Foundation continues to focus on progressive solutions for their customers. Utilizing product technologies such as SHORE PAC and SLURRY BUSTER from CETCO, Case Foundation was able to deliver ADOT a successful project on budget, satisfying all environmental concerns.

