

## Case Study; Drilled Shafts Installation in Difficult Site Conditions; Loose Sand and High Water Table

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**Abstract :** Selecting the most effective construction method for drilled shafts under the high phreatic surface can be a challenging task that requires effective communication between the design and construction teams. Slurry placement, temporary casing, and permanent casing are the three most commonly used installation techniques to ensure the stability of the drilled hole before casting the concrete. Each one of these methods has its implications on the installation and performance of the drilled piers. Drilled shafts were designed to support a fire wall for an Energy project in Central Texas. The subsurface consisted of interlayers of sands and clays of varying shear strengths. The design recommended that the shafts be installed with temporary casing or slurry displacement due to the anticipated groundwater seepage through granular soils. During the foundation construction, it was very difficult to maintain the stability of the hole, and the contractor requested to install the shafts using permanent casings. Therefore, the foundation design was modified to ensure that the cased shafts achieve the required load capacity. Effective and continuous communications between the owner, contractor and design team during field shaft installations to mitigate the unforeseen challenges helped the team to successfully complete the project.

**Keywords :** construction challenges, deep foundations, drilled shafts, loose sands underwater table, permanent casing

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