Drilled Shafts

Condon-Johnson & Associates (CJA) is proud of a long and successful record of installing drilled shafts of all sizes and depths. Drilled shafts, also known as drilled piers, Cast-in-Drilled-Hole Piles (CIDH piles), or Cast-in-Situ piles, are used to transfer structural loads and moments through the relatively weak upper strata of many sites to deeper, stronger soils which have sufficient capacity for the anticipated loading.

Drilled shafts are deep, cylindrical, cast-in-place concrete foundations reinforced using full-length rebar cages and formed by a drilled borehole excavation. They can range in diameter from 18-inches to greater than 20-feet and reach depths over 250 feet. They are often used as a structural support where seismic loadings create large moment requirements which ultimately govern the bridge foundation design. Drilled shafts have additional foundation uses including building support, cantilevered signs, communication towers, and landslide retention.

Construction methods depend on the geology of the site and on-site access. CJA is competent with dry, wet (slurry), and oscillated/rotated cased drilling methods. Dry drilling methods are used in non-caving, cohesive soils, which are generally located above the local ground water table. An auger is advanced (it must be removed periodically to remove the borehole soils) until bottom of pile elevation is reached. A cleanout bucket is then used to ensure the bottom of the hole is free of debris.

Wet or slurry drilling methods are used where caving of the drilled borehole is probable, typically when the local ground water table is located within the length of the shaft. By maintaining the slurry or water above the ground water table while drilling, a positive pressure will be exerted on the sides of the shaft to prevent the inward flow of water and the likelihood of caving is reduced. There are three different classifications of drilling fluid: freshwater, mineral, or polymer.

Casing construction methods are applicable where wet or slurry drilling methods are used. The cased method uses a temporary steel casing that is installed in the excavation to provide the lateral support necessary for maintaining the integrity of the hole. CJA uses the latest European and North American innovations for installation of the casing using an oscillator or rotator to minimize vibrations while advancing casing from 3-ft to 10-ft in diameter.

Our drilled shafts are regularly tested using state-of-the art non-destructive testing techniques and receive approval ratings high above industry standards.

For more information on CJA’s expertise and services for drilled shafts, please contact our nearest office location.