



South Texas Wind Farm



Ground Improvement – Installing Vibratory Stone Columns

PROJECT OVERVIEW

The wind turbines are mounted to towers and the height of these towers makes them susceptible to the force of the same winds powering the turbines. The towers will tip in the wind and the foundation must resist this force to stop the tower from rocking. The foundation for these towers must also stand up to elements like earthquakes and other natural factors.

REQUIREMENTS AND CHALLENGES

The large overturning moments caused by the wind can lead to differential settlement problems in soft soil and they require additional foundation support. That is where our services with vibratory stone columns make their impact. Our certified rig operators installed VSCs through soft clay and loose sand up to 18 feet below the existing grade at 13 turbine locations. The purpose of the VSCs was to control total settlement of the wind turbines and minimize differential settlements expected from the large overturning movements so the turbines can perform as planned.

Due to the depth of wind turbine foundations, we developed a specific load testing process to measure the modulus of the VSC within the zone of soil below the final turbine foundation bearing elevation. This custom procedure consists of installing a sacrificial test outside the turbine footprint and a concrete-filled sonotube shaft to the bottom of foundation elevation. This enables the VSCs to be tested at the final elevation to provide the best representation of their long-term performance.

SOLUTION AND RESULTS

CNC Foundations developed a detailed testing Quality Control plan to ensure the full-scale modulus test at each turbine is installed and performed consistently. This sequence not only qualifies our design, but is performed to keep the project on schedule and includes the Closeout Document Process. As part of CNC Foundations' quality control plan is the reassurance from our closeout document process to provide the client with the VSC logs, test results, and as-built drawings within 48 hours of completing each turbine.

Project Details

SECTOR

Wind Farm

LOCATION

Texas

APPLICATION(S)

Vibratory Stone Columns (VSCs) & Load Testing Process

