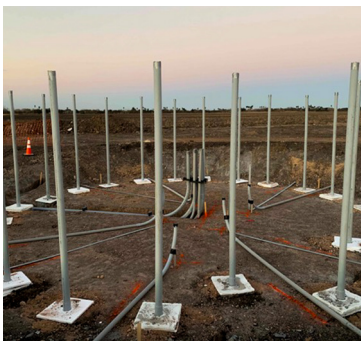
CASE STUDY

PALMAS ALTAS WIND FARM

PROJECT OVERVIEW

The development of the Palmas Altas Wind Farm in Rio Hondo, Texas involved the construction of 46 utility-scale wind turbines across more than 10 square miles. Each turbine generates 3.15 MW and stands 150 meters (492 feet) tall, with an 87.5-meter (287-foot) hub height and a 125-meter (410-foot) rotor diameter. The project's scale and dispersed layout made foundation efficiency and constructability essential.



CHALLENGES:

The site consisted of highly variable soil profiles, shallow brackish groundwater, and areas susceptible to flooding. These conditions made traditional Gravity Spread Footings (GSF) impractical, as they required deep excavations, dewatering, and groundwater treatment. Delivering the large volumes of concrete necessary for GSFs across a remote 10-square-mile site with poor access roads would have further slowed construction and increased risk.

Separately, an alternative foundation concept involving a smaller pile cap with post-tensioned anchors/piles was explored. However, during the investigation phase, the test piles were found to be defective at several turbine locations due to the variability in subsurface conditions, making this option unreliable across the site.

SOLUTION:

IDEAL analyzed the site's diverse geotechnical challenges and engineered a unified deep foundation system using our proprietary STELCOR DDM technology paired with a smaller concrete pile cap. Each turbine foundation consisted of a 30-foot-diameter, 6-foot-thick concrete cap supported by 24 STELCOR anchors, each designed for 243 kips of tension and compression capacity. This approach eliminated the need for deep excavations and dewatering, dramatically reduced concrete requirements, and delivered consistent performance across all soil conditions on the project. The STELCOR system also enabled lower-cost mobilization, more agile installation equipment, and significantly faster production rates—critical advantages for a project of this scale and remoteness.

By integrating engineering, manufacturing, sourcing, and construction under one roof, Ideal delivered a streamlined and predictable foundation program that reduced risk, accelerated the schedule, and provided long-term performance assurance for the client.

Since construction was completed in 2018, reports from the region indicate that newer wind farms supported by alternative foundations have experienced excessive settlement and movement. In contrast, the Palmas Altas Wind Farm has exhibited no measurable settlement or movement, a result that surprised the engineering community involved in the project. This performance stands as a testament to Ideal's ability to engineer and deliver the right foundation solution for the most technically demanding conditions.