

# THE POWER TO DELIVER

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**H**elical Pier Systems (HPS) is North America's largest engineering, manufacturer, and installer of helical piles since 1977. As a proven leader in the piling industry, HPS is committed to providing custom engineered helical piling solutions that meet the needs of clients over a diverse range of industries from residential, commercial, power transmission and telecommunication, oil & gas and provincial and municipal government agencies.

During the winter of 2008/2009, ATCO Electric looked to HPS to engineer, manufacture and install pile foundations for their recently approved Wesley Creek to Mickle 240 KV double-circuit

transmission line in the Peace River area of Alberta. A project valued at \$120 million, the transmission line was designed with 426 steel lattice towers stretching over 126 km over varying and muskeg terrain, and spanning one major river crossing. Multiple foundation types would be required and installed to support each structure, and helical piles were chosen as the primary tower foundation system.

The original project schedule was set at 60 days with five units for the installation of approximately 6,000 piles, based on an estimated installation of 20 piles per unit per day. ATCO Electric project managers also needed to fast-track the construction due to



various obstacles such as weather, access, political disruptions and the migration of wildlife.

Helical pile foundations are both dependant on the applied load and resistance of that load in the soil, so a proper geotechnical investigation was carried out. The results for the geotechnical program were utilized to determine the most appropriate foundation type at each structure location.

In order to stay on schedule, the brushing (tree clearing) needed to stay ahead of the pile installation. Winter installations prove to be easier accomplished over difficult terrains and soft (muskeg) grounds but climate and frozen ground creates a challenging installation environment for the crews and their equipment.

To validate the helical pile design, a comprehensive testing program was initiated by HPS to ensure the highest level of quality control and assurance. As well as having to adhere to the ASTM standard for load testing, HPS personnel also needed to be mobile, fast, and accurate.

HPS performed multiple load tests, where the results were then used to optimize the helical pile design for each of the tower bases. In some cases, the load test results allowed for an extra 50 per cent capacity to be utilized.

HPS manufacturing quality assurance required an equal amount of management; cradle-to-grave product traceability is strictly enforced from raw materials, through production to storage, and delivery to installation. Material selection, steel plate and steel pipe, needed to be of the expected quality – readily available and traceable. HPS coordinated their manufacturing facilities to meet the needs of this project while ensuring all other projects both large and small receive the same level of controls and considerations. Enough lead time was taken to ensure the production of 6,000 piles was completed on time. Improvements in fabrication enabled HPS facilities to drastically increase production.

Throughout the complete cycle of the project HPS surpassed the logistical challenges of a cold climate, production, and delivery and installation in a remote location. At the request of the client, due to the downturn in global economy, only 35 per cent of the pile installation was completed. HPS doubled expected installation rates mobilizing three units, which installed 2,136 piles in 18 days, averaging 40 piles per unit per day. Pile cap installation was expedited through the use of Shelters and wire fed welding processes.

Their performance beginning with engineering and design through to installation confirmed once again HPS has the power to deliver. 

