

The Evolution of Engineering Excellence

HIGH CAPACITY HELICAL PILING

By Helical Pier Systems Ltd

As civil, structural and geotechnical engineers become more familiar with helical pile technology, they are specifying helical piles to support increasingly larger and more diverse structural loads. Project owners, construction contractors and foundation installers alike are recognizing the economic benefits of the use of helical piles as an alternative to traditional foundation support methods.

Currently the onus is on the manufacturers and marketers of helical piles to educate project owners and engineers. The goal being to plant the seeds that will proliferate the use of helical piles, resulting in the technology reaching its full potential as the choice for high capacity deep foundations. This continuing educa-

tion process has been slow, but it has been increasingly successful.

Architects and engineers look for economic feasibility and performance reliability in high capacity foundations with an accurate account of empirical results. It is the responsibility of the foundation contractor to provide all of the required information for the customers to make the best, qualified decisions. Specifying high capacity helical piles for foundation construction in varying industries has been the result.

The solution for high capacity pile and foundation design is not an easy one; performance requirements demand excellence. Geotechnical surveys play a key role. Careful examination of the soils

study, combined with empirical based formulation by geotechnical and civil/structural engineers results in the determination of pile design.

The resultant engineered designs must be tested and confirmed. Owners and their engineers must be assured that the designs are backed by quality engineering, manufacturing and installation.

Helical Pier Systems Ltd. ('HPS') has responded to the demand for quality engineering and has evolved into turnkey foundation specialists with design-build capabilities. HPS maintains their role as North America's Leader in engineered pile design, manufacturing and installation. HPS takes great pride in knowing that projects throughout North America have

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been designed using the expertise of HPS engineers.

HPS employs four professional engineers, three of which have earned Masters of Engineering in their respective disciplines; geotechnical, civil and structural. HPS engineers are registered in British Columbia, Alberta and Saskatchewan and are currently awaiting registration in Manitoba and Ontario.

Although HPS' core business is the design, manufacture and installation of helical piles it has the capability to engineer any deep foundation technology including driven and concrete piling. The concept is to provide turnkey foundations optimized for best economics.

HPS Engineering Manager, Thomas D. Bradka, M.Eng., P.Eng., most significant project was the "Dover to Whitefish" power transmission constructed in winter of 2003/2004. The project budget was \$100,000,000, and consisted of 354 kilometers of 240kV transmission line and three substations. Founded on approximately 6,000 pilings, it was the largest all-steel power line project constructed in Alberta. The project received the 2005 Edison International award from Edison Electrical Institute (EEI) for most outstanding project.

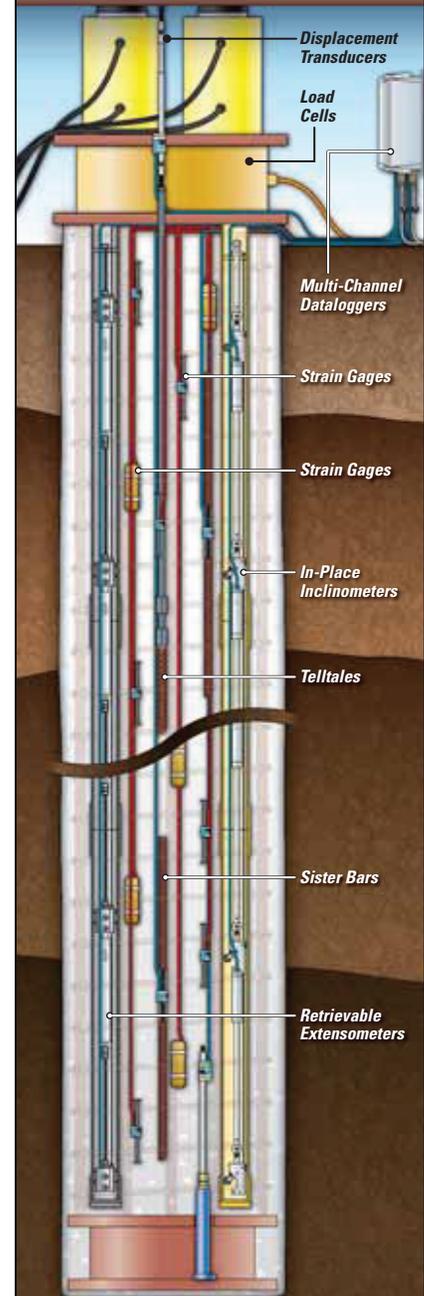
Electrical power generating wind turbine foundations designed for the south-Western coast of Alaska. This HPS project had an engineering group design a complex 6-20 inch diameter helical arrangement embedded 40 feet into dense permafrost. The presence of warm, degrading permafrost has required innovative foundation designs, including the use of helical piers to support an engineer designed supporting steel grillage and concrete foundation. Uplift forces imposed on the foundations were approximately 100 kips or 50 tons. Additional design criteria include the overturning moment (1,830,000 ft-lb), the total weight of the tower/turbine (42,000 lb), and the 130,000-lb concrete/steel foundation structure.

HPS understands the requirements for load testing and the importance of the results. Pile foundations are designed based on the subsurface soils and expected loads. Load testing validates the design. Two hundred ton compressive loads were tested and validated near Milwaukee, Wisconsin. The resulting foundation was raised coal conveyor system. In northern Alberta lateral (6 tons @ 1/2 inch deflection) and uplift (100 ton) testing was completed to validate designs for 240 kV lattice towers.

Project success is paramount. HPS provides customers with a turnkey solution for any foundation project. ■

Pile Testing Instrumentation

- Load Distribution
- Deflection
- Displacement



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